A comprehensive approach to improving patient flow in our hospitals — the ‘left to right, over and under’ concept

OBITUARY: Dr John Francis Arthur (2 May 1930 – 7 March 2015)

Factors associated with nutrition risk in older Māori: a cross sectional study

Eye health outreach services in the Pacific Islands region: an updated profile

Urate testing in gout: why, when and how

Food consumption in children—the Pacific Islands study
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</tr>
</thead>
<tbody>
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<td>Individuals*</td>
<td>$290</td>
</tr>
<tr>
<td>Individual article</td>
<td>$25</td>
</tr>
<tr>
<td>Individual</td>
<td>$402</td>
</tr>
<tr>
<td>Institutions</td>
<td>$543</td>
</tr>
<tr>
<td>Individual article</td>
<td>$25</td>
</tr>
</tbody>
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EDITORIAL

6
The role of New Zealand health professional training institutions in capacity building in the Pacific region
Faafetai Sopoaga, Peter Crampton, Alec Ekeroma, David Perez, Kiki Maoate, Bradley Watson, Jesse Kokaua, Katharina Blattner

10
Is it time to pay the PIPER?
Frank Frizelle

13
Active surveillance guidance for New Zealand men with low-risk prostate cancer
John Nacey, Brett Delahunt, Stephen Mark, John Matthews, Andrew Williams, Trish White, Andrew Simpson

ARTICLES

16
Tracking food consumption frequency of children from age 4 to 6 years: the Pacific Islands Families study
Fa’asisia Savila, Victor Obolonkin, Elaine Rush

25
Eye health outreach services in the Pacific Islands region: an updated profile
Julianna Lees, Judith McCool, Alistair Woodward

34
Mā mahi, ka ora—by work, we prosper—traditional healers and workforce development
Annabel Ahuriri-Driscoll, Amohia Boultone, Albie Stewart, Gill Potaka-Osborne, Maui Hudson

45
Factors associated with nutrition risk in older Māori: a cross sectional study
Carol Wham, Eruera Maxted, Ruth Teh, Ngaire Kerse

VIEWPOINT

55
A comprehensive approach to improving patient flow in our hospitals—the ‘left to right, over and under’ concept
Michael Ardagh

65
Urate testing in gout: why, when and how
Nicola Dalbeth, Doone Winnard, Peter J Gow, D Ross Boswell, Leanne Te Karu, Karen Lindsay, Bruce Arroll, Lisa K Stamp

CLINICAL CORRESPONDENCE

69
What is this condition and how could it be treated?
Pamela Buchwald, Eve Keller, Christopher Wakeman

70
A pain in the ass...
Ya-Chu M Tsai, Louise E Nardone

LETTERS

72
Excise, electronic cigarettes and nicotine reduction to reduce smoking prevalence in New Zealand by 2025
Murray Laugesen, Randolph C. Grace

OBITUARY

75
Dr John Francis Arthur

77
Methuselah

78
British Medical Association attacked
Tracking food consumption frequency of children from age 4 to 6 years: the Pacific Islands Families study
Fa'asisila Savila, Victor Obolonkin, Elaine Rush
This study investigated food consumption patterns of a group of young Auckland children who are of Pacific Island ethnicity, aged 4 and 6 years old. We wanted to learn about the types of food they were eating and if the food being eaten was consistent with that being attributed to rapid and unhealthy weight gain. These foods are high energy foods, usually carbohydrates and fats. On top of snack foods (e.g. crisps and noodles), we found that the food they were eating most of all were, indeed, processed carbohydrates: white bread, white rice and cereals. There was limited evidence of a high fat diet. We hope that organisations and community can use this information to support young children and families to eat a more diverse range of whole foods and less processed carbohydrates.

Eye health outreach services in the Pacific Islands region: an updated profile
Julianna Lees, Judith McCool, Alistair Woodward
Pacific Islands countries carry a high burden of eye disease, with cataract, diabetic retinopathy, and to a lesser extent, trachoma most common. Eye care in the Pacific is delivered by national health systems and NGOs such as Fred Hollows Foundation NZ. Outreach clinics in the Pacific Islands are run by nurses and ophthalmologists trained by FHFNZ. Data collected at these clinics between 2009 and 2013 was analysed to determine change in presentation of cases over eight countries. Data show changes in eye health across the region, with refractive error more common in PNG, in three countries (of seven) data indicates a decline in the number of cases. Several reasons explain this change, including successful service delivery to ensure backload of cases are diminished or changes to number of clinicians and therefore services available. The rise of (asymptomatic) diabetic retinopathy may explain the lower number of cases presenting at clinics.

Mā mahi, ka ora: by work, we prosper—traditional healers and workforce development
Annabel Ahuriri-Driscoll, Amohia Boulton, Albie Stewart, Gill Potaka-Osborne, Maui Hudson
Rongoā Māori is a traditional approach to health and wellbeing, practised today by healers throughout the country. Results from a nationwide survey have shown that a large proportion of healers desire further training, to sustain rongoā Māori practice and service delivery. Such training must be able to meet the needs of both established and trainee healers, requiring a variety of training formats and focuses. This article outlines the demographic characteristics, skills and capacities of those healers surveyed, and discusses the implications for future healing workforce development.
Factors associated with nutrition risk in older Māori: a cross sectional study
Carol Wham, Eruera Maxted, Ruth Teh, Ngaire Kerse
This paper shows that amongst 67 older Māori (aged 75-79 years) living in Northland and the Bay of Plenty two thirds (63%) were identified to be at high risk for malnutrition. In a 14 item questionnaire the most frequent items that contributed to high risk for malnutrition were a low intake of milk products, meat and protein alternatives, fruit and vegetables as well as unintentional weight change and skipping meals. The factors that protected older Māori from not being at high risk of malnutrition were: rating traditional foods as important and being able to access them; having a higher waist to hip ratio; having an absence of depressive symptoms

A comprehensive approach to improving patient flow in our hospitals—the ‘left to right, over and under’ concept
Michael Ardagh
It is essential we manage the capacity of our hospitals so that acute demand can be accommodated without developing queues for care and backlogs of work. This paper presents a comprehensive model for improving patient flow in our hospitals by attending carefully to both the demand and capacity states of the hospital and maximising efficient flow of our acute patient journeys. The model includes attention to the patient journey as the central focus, with an overarching governance structure and an underpinning sophisticated operations structure.
The role of New Zealand health professional training institutions in capacity building in the Pacific region

Faafetai Sopoaga, Peter Crampton, Alec Ekeroma, David Perez, Kiki Maoate, Bradley Watson, Jesse Kokaua, Katharina Blattner

New Zealand has a long history of political, cultural and economic ties to many islands in the Pacific region. New Zealand also plays an important part as a member of the Pacific Forum. There are 22 Pacific Island countries and territories with a total population of more than 10 million people—one in five are aged between 15 and 24 years.\textsuperscript{1,2} Trade and aid form an important part of New Zealand’s special relationship with Pacific Island nations. New Zealand has provided significant support for Pacific Island countries, such as assistance after the Vanuatu cyclone\textsuperscript{3} and the tremendous response by the government and people of New Zealand to the tsunami that affected Tonga and Samoa.\textsuperscript{4} New Zealand also assists in many multilateral, regional and bilateral programmes. Key focus areas include health sector capacity building, communicable and non-communicable diseases and capacity building for research.\textsuperscript{5} The ties between New Zealand and Pacific Island countries are further strengthened with many Pacific people now working and residing permanently in New Zealand.\textsuperscript{6}

In their article ‘Eye health outreach services in the Pacific Islands region’, Lees, McCool and Woodward outline a number of New Zealand-based organisations that make significant contributions to services in the region, such as the Fred Hollows Foundation New Zealand (FHFNZ). The authors report that there are no locally-based ophthalmic nurses to undertake screening of patients in Papua New Guinea. Developing a health workforce to meet the health needs of their populations is important for both developed and resource-poor countries. The histories of Pacific peoples in New Zealand, and New Zealand’s interaction with the Pacific region, have led to many reciprocal relationships, especially in the areas of health and education. While these relationships have been mutually beneficial, there still remain many challenges for the Pacific region’s workforce to meet the health needs of its growing population.

The medical workforce density in the Pacific Islands varies between 0.1 and 0.5 doctors per 1,000 population, compared to 2.7 per 1,000 in New Zealand.\textsuperscript{7} In order for Pacific nations to meet the health needs of their populations, there needs to be an increase in the numbers of doctors trained in the Pacific Islands from the current output of 140 per annum. For many years, the training of medical doctors in the Pacific has been provided by the Fiji School of Medicine and the University of Papua New Guinea. The former was founded in 1885 and was the main medical school in the region; the latter opened its doors in 1972. Post-graduate programmes are offered through both medical schools. More recently, undergraduate medical training has also been provided by the Cuban government in response to the shortage of doctors in some Pacific countries. In addition, private medical schools have been established in Fiji and Samoa. The
medical school in Samoa was nationalised last year to form the Faculty of Medicine of the National University of Samoa (NUS). The government of Samoa sought assistance from medical schools in New Zealand for support in the development of a medical curriculum for the new Faculty of Medicine. The faculties of Medicine at the University of Auckland and Otago Medical School have been assisting health services in the region by building capacity and capability of their medical staff, by direct course training in New Zealand, staff exchanges and provision of intellectual materials. Otago and Auckland are committed to providing ongoing support for the NUS Faculty of Medicine’s teaching programme while it is in the initial stages of development. The Otago Medical School had assisted the early development of the Fiji School of Medicine and has responded to requests for assistance from other medical schools in the region. The requests for assistance align with the University of Otago’s Pacific Strategic Framework. The framework, approved by the University of Otago Council in 2012, prioritises its longstanding commitment to local, national and regional Pacific communities. Furthermore, parallels can be drawn between New Zealand’s first medical school—established at Otago in 1875—and Samoa’s recently established medical school. When the Otago Medical School first started it had only “one professor, one student, one classroom and one cadaver”. It is not unrealistic, therefore, for Samoa over the next 100 years to develop its medical school to a stage where it not only meets its own medical health workforce needs, but also strongly contributes to meeting the health workforce needs in the Pacific region.

Examples of self-determination in health and education can be seen in the Cook Islands and Samoa, in collaboration with New Zealand health training institutions. In the Cook Islands, the government assessed the need for further professional development of its own medical doctors. A new initiative led by the Cook Islands government has seen the establishment of a post-graduate training programme for their doctors in collaboration with the Royal New Zealand College of General Practitioners and its Division of Rural Hospital Medicine and Otago Medical School. Additionally, the head of dental services in the Cook Islands has collaborated with the University of Otago Faculty of Dentistry staff to provide free dental care in the Cook Islands for over 10 years. A similar initiative has just been established in Samoa. These Cook Islands and Samoa-based senior dental health professionals have received post-graduate training at the University of Otago. There are other areas where Otago staff have provided ongoing clinical support, including mental health, gastroenterology and medical research. These initiatives have been successful through long-term commitment and engagements, excellent working relationships based on mutual trust supported by an active Memorandum of Understanding.

These activities in the health workforce sector suggest Pacific Island countries are determining their own priorities and responding in a proactive manner. It is very important that health training institutions and organisations in Pacific Island countries take the lead and have local ownership of the way forward—whether it is in teaching, service or research. New Zealand health professional training institutions have a significant role in supporting capacity building and health workforce training needs in the region through advice, provision of technical skills and resources. Whatever assistance is provided, it should address health disparities in the Pacific region, needs to be culturally relevant and enable the development of local capacity. Pacific countries have their own mechanisms for accreditation, registration and retention of their workforce which external partners can add value to. There are significant gains also for New Zealand-based training institutions as a result of these partnerships. For example, there are increased opportunities for cultural learning, sharing of knowledge, development of skills to navigate the Pacific context and strengthening of relationships for New Zealand health professional staff, students and researchers. In addition, development of new teaching and research partnerships will follow and there are potential gains for New Zealand-based Pacific communities through an increased
understanding of the cultural needs and context for Pacific people living in New Zealand.

The pathway whereby Pacific countries exercise self-determination and provide leadership in the way forward ensures that assistance provided from external partners is likely to better suit local needs. It also ensures the sustainability of health workforce training programmes as they are incorporated into individual countries’ long-term health workforce capacity building and research needs planning. The role of New Zealand health training institutions in building capacity in the Pacific region benefits both the New Zealand training institutions and the Pacific Island nations. For New Zealand clinicians, students and researchers, the region and our current collaborations allow for greater knowledge of culturally safe practices in our New Zealand health context. For the region, these collaborations build further capacity for locally-based health practitioners and provide a strong platform for Pacific self-determination.

Competing interests: Nil

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REFERENCES:
wiki/2009_Samoa_earthquake_and_tsunami.


Is it time to pay the PIPER?

Frank Frizelle

The recently realised results of the PIPER study are a tremendous insight into the journey of patients with colorectal cancer in New Zealand. The PIPER study should force us to acknowledge and accept the unpleasant consequence of our present inadequate management of patients with colon and rectal cancer (CRC). The results should be considered a call to do better. A full copy of the report can be found on the University of Auckland Faculty of Medical and Health Services website, while the study is briefly summarised below.

The PIPER study is a comprehensive study of the outcome and management of New Zealanders with colorectal cancer. This study was a national retrospective cohort study of selected sample New Zealand residents diagnosed with colorectal adenocarcinoma in New Zealand from 1 January 2007 to 31 December, 2009. The researchers hand-searched the medical records of 6,387 patients, resulting in 5,667 eligible patients. The process of data collection took over 9,000 hours and recorded over 960,000 individual data points.

They found 4,193 (74%) were diagnosed with colon cancer, and 1,401 (25%) with rectal cancer. Most patients were of European extraction, with 8% recorded as Māori, 3% as Pacific, and 2% as Asian. The proportion of colon cancers that were right-sided (located proximal to the splenic flexure) was 51% and the proportion that were left-sided was 48% (sidedness was unknown for 1%). Females were more likely to have a right-sided colonic tumour (57%). While males were more likely to have a left-sided tumour (54%).

The mode of first presentation was to the emergency department (ED) for 34% of patients with colon cancer, with 44% for Māori and 51% for Pacific patients. In the UK, 21% of CRC patients have this mode of admission. For patients with rectal cancer, the mode of first presentation was to the ED for 14% of patients, 21% for Māori and 24% for Pacific patients. While 8% of patients with colorectal cancer presented with a bowel obstruction.

The stage of CRC at diagnosis is the single most powerful prognostic variable, and is the principal determinant of treatment. New Zealand has a relatively higher proportion of patients diagnosed with stage IV (metastatic) disease than other countries—Australia has 19% and 17% stage IV for colon and rectal cancer respectively, and the UK has 17% for both stage IV colon and rectal. Higher proportions of metastatic disease were seen in Māori and Pacific patients: the proportions diagnosed with stage IV colon cancer being 32% and 35% for Māori and Pacific respectively, and for rectal cancer being 29% and 22% respectively.

The PIPER study can only describe what has been—it does not tell us what can be done to improve the outcome of patients with colorectal cancer. Since the publication of this study, the media have asked what we can do to improve the outcome, and this focus has understandably and clearly been on the absence of colorectal cancer screening in New Zealand, however besides screening, population education of symptoms and early investigation may also help.

The background of colon cancer screening in New Zealand has previously been discussed in the Journal. The benefit for colorectal cancer screening is well established, and the plan to repeat a trial in New Zealand was another unnecessary Government delaying tactic. The results are very similar to most other studies, only more polyps and cancers were found—not really a surprise in a country with one of the highest rates of colorectal cancer in the world.
We have been hearing about the lack of resources for colonoscopy since the 1998 report into population colorectal cancer screening in New Zealand. That report stated that the benefit of colorectal screening was likely to be similar to breast screening, however there were significant differences regarding risks and benefits to the screening tools. Resources (access to colonoscopy) were identified as a major issue, and the report suggested providing more colonoscopy services in the public sector.

The response by those in charge as to why screening is still delayed has been to state that though it is recognised that colorectal cancer screening is inevitable, their need was for adequate planning, resource allocation and provision for infrastructure prior to the roll-out of national screening. Little changed in 17 years.

Another news item on colorectal cancer this week, gives insight into the minds of those behind the screening fiasco. It was reported that if a patient buys a FOBT (faecal occult blood test) screening kit themselves which gives a positive result, then the patient will not get a government-funded colonoscopy because—and I quote—“This type of screening does not include a systematic approach to the screening test, diagnosis and treatment, or consistent support for people who purchase these FOBT kits”. Such comments by those empowered to advance colorectal cancer screening does not give us much hope of any action soon.

For 17 years, the same people have been making the same claims: not enough resources. The PIPER study shows what impact these delays have had on patients. We need to acknowledge and accept the unpleasant consequence of our current inadequate management of patients with CRC. Colorectal cancer screening should be progressed with reasonable speed. While the cornerstone features need to be put in place, many of the details can be resolved with good management, as details are quickly adapted as needed with the rollout. In that way we can correct the awful state of affairs the PIPER study has confirmed, and put an end to the years of talk and relative inaction.

Competing interests: Nil
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4. Frizelle FA. Colorectal cancer in New Zealand- NZMJ 2007; 120; 1258, 6-8


Prostate cancer is the most common non-cutaneous malignancy affecting New Zealand men and accounts for 27% of all annual registrations of cancer. This malignancy is a significant burden to men’s health and kills around 600 men every year in New Zealand.1

The Ministry of Health’s Awareness and Quality Improvement Programme for prostate cancer aims to improve prostate cancer outcomes for men and has a strong equity focus.2 The newly published Ministry of Health guidance on using active surveillance to manage men with low-risk prostate cancer is the first of a suite of documents that are being developed to ensure that men have better and more equitable access to information about prostate cancer.3 The guidance offers support to primary care practitioners and specialists who manage men with low-risk prostate cancer and provides a mechanism for ensuring that men not only receive consistent advice and care, but also have equitable outcomes across the entire care pathway. The Urological Society of Australia and the New Zealand branch of the Royal Australian and New Zealand College of Radiologists have endorsed this guidance.

Curative treatment of prostate cancer, like other malignancies, carries a risk of adverse events. Active surveillance aims to avoid or delay the need for curative treatment in low-grade, low-volume prostate cancers, thereby reducing the potential for treatment-related harms.4 Active surveillance involves actively monitoring the prostate cancer with regular prostate-specific antigen (PSA) tests, digital rectal examinations (DREs), prostate biopsies and magnetic resonance imaging of the prostate (MRIs). This allows the urologist to determine whether the cancer is progressing either in aggressiveness or extent. If progression is confirmed, the patient then has the option to undergo curative treatment.5,6

Effective active surveillance is dependant on accurate risk stratification. For many years, Gleason scoring of prostate cancer has been used to facilitate the stratification of outcomes. While this scoring system is still used, grading of prostate cancer has evolved since the initial reports of Gleason, and in 2005 and 2014 two consensus conferences convened by the International Society of Urological Pathology (ISUP) led to the establishment of a new grading system for these tumours.7,8 In this system tumours are graded from ISUP grade 1 through to ISUP grade 5. Cancers consisting of well-formed acini, which were previously considered a component of Gleason score 3+3=6, are now assigned to the lowest ISUP grade. There is good evidence to suggest that tumours showing this morphology progress either slowly, or not at all, and even cases with evidence of localised spread appear to have a good prognosis.9-11 It is for this reason that organ-confined ISUP grade 1 tumours (Gleason 3+3=6) are considered suitable for active surveillance. This does not apply to cancers of higher grade which have more aggressive growth characteristics and for which early treatment is indicated.

These developments mean that at diagnosis we can be more confident of assigning to each patient an accurate risk of disease progression. Men with a low-risk profile may be suitable for either active surveillance or curative treatment, using either radical prostatectomy or radiation therapy by either brachytherapy or external beam. Some men who are suitable for active surveillance will instead choose curative treatment because of their own heightened anxiety of having untreated cancer and the required
intensive monitoring that active surveillance requires.\textsuperscript{12,13} Those at intermediate or high-risk of disease progression are not suitable for active surveillance and need to be considered for curative treatment.

Entering an active surveillance programme means that men potentially avoid the adverse effects of surgery or radiation therapy.\textsuperscript{14} Urologists are well aware that for men on active surveillance programs there is a greater likelihood that they will die from causes other than prostate cancer. The risk is that men may develop more aggressive cancer and ultimately require not just radical intervention, but also adjuvant treatment. Therefore, men on active surveillance require regular monitoring and while the triggers for intervention vary between protocols, most rely on the findings of re-biopsy.

If the original entry criteria for including men in active surveillance are breached (Gleason score/ISUP grade and tumour volume), then men are likely to be directed to curative treatment. In addition, for many men the anxiety of an increasing PSA (even one that does not meet an intervention criterion of doubling time <3 years) will cause them to leave an active surveillance program and opt for curative treatment.

The care of men on active surveillance should be led by a urologist who is also responsible for developing the initial active surveillance care plan. Other health professionals, such as general practitioners or nurse practitioners in primary health, or nurses working in advanced practice roles within District Health Boards (DHBs), can share care and provide the ongoing monitoring and support these men require. The responsibilities of the urologist and the other health professional should be clearly documented in the man’s active surveillance care plan. Where an aspect of care has been devolved to another health professional, regular contact with the lead urologist is required. Urologists are responsible for reviewing men’s active surveillance care plans and this should be done at least every 12 months.

DHBs are expected to include the active surveillance guidance within their care pathways as part of their 2015/16 Annual Plans. When implementing the guidance, we encourage each DHB urology and radiology department to discuss how the guidance should be integrated into their clinical pathways and to discuss what resource implications the guidance will have for magnetic resonance imaging (MRI). Nationally, MRI is a constrained resource for both diagnostic and surveillance imaging. Therefore, it is important to ensure that each DHB can meet the diagnostic and active surveillance demands for prostate-related MRIs, within clinically appropriate timeframes, before its pathways are confirmed.

DHBs and primary health organisations should also be conscious of the disparities in prostate cancer outcomes for different populations (such as Māori men and men who live in rural communities) before implementing this guidance. For example, Māori men are less likely to be diagnosed with prostate cancer than non-Māori men, but are 36% more likely to die from the disease.\textsuperscript{15} The reasons behind these disparities are not well understood. However they appear, in part, to be related to differences in men’s access to appropriate information, and to diagnostic and treatment services.

It is expected that the increasing utilisation of active surveillance in New Zealand will lead to a reduction in the number of men undergoing unnecessary curative treatment for indolent disease. Many urologists remain cautious about this management option because of the dependence on histologic grading and the possibility of false negative results on prostate re-biopsy. This means that a man may develop more aggressive prostate cancer that remains undetected. The development of prostate cancer-specific biomarkers, genetic profiling and improvements in prostate cancer imaging are enhancements that will lessen this risk and improve our ability to select men who are genuinely low-risk. Improved education of health practitioners is likely to lead to an increased utilisation of active surveillance and a reduction in the morbidity of prostate cancer treatment. With greater accuracy at diagnosis the harms of over treatment will be minimised and perhaps we will in the future be at a point of giving further consideration to a targeted screening programme.
EDITORIAL

Competing interests: Nil

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Tracking food consumption frequency of children from age 4 to 6 years: the Pacific Islands Families study
Fa’asisila Savila, Victor Obolonkin, Elaine Rush

ABSTRACT

AIM: To report longitudinal food frequency consumption and evaluate tracking of food frequency among a cohort of New Zealand-born Pacific children.

OBJECTIVE: Identify the most commonly consumed foods and estimate tracking among Pacific children aged 4 and 6 years.

METHOD: A qualitative food frequency questionnaire was administered to n>1,000 caregivers of children aged 4 and 6 years. Consumption scores were developed from averaged frequency of daily food. Foods and food groups were examined for tracking.

RESULTS: Caregivers completed questionnaires for 646 children at both ages. Twelve most frequently consumed foods were identified, accounting for up to 25% of all food consumed daily. Across ages 4 and 6, the association for frequency of the most frequently consumed foods was moderate ($r^2=0.53$). Food groups: breads and cereals; meat and alternates; and vegetables and fruit constituted approximately 72% of all foods consumed daily. The association of frequency of consumption within food groups across the two measurement periods was strong ($r^2=0.96$).

CONCLUSIONS: Pacific children consume similar foods that track from age 4 through age 6 years.

Optimal maternal and early childhood food contributes to healthy cognitive and physiological growth of the child. On the other hand, poor diet can lead to rapid growth and chronic disease, and behaviours like skipping breakfast can impact negatively on cognitive function. Of particular concern is the growing prevalence of childhood obesity, attributed to an environment that supports inactivity and the consumption of nutrient-poor and energy-dense foods.

Maternal feeding styles determine infant dietary patterns during a time when food and taste preferences are developing. Furthermore, studies have documented the tracking (or stability) of children's food patterns throughout childhood and into adulthood. Using principal components analysis, Northstone and Emmett (2008) observed three predominant food patterns over four ages—3, 4, 7 and 9 years: processed (high fat and sugar content, processed and convenience foods); traditional (meat, poultry, potato and vegetables); and health conscious (salads, vegetables, fish, pasta and rice). Foods in the traditional pattern loaded highly from age 4 to 9 years, yet foods in the processed pattern loaded highly at every age. Overall, the literature provides good evidence for the tracking of childhood food patterns for predominantly Anglo-Saxon cohorts, but less attention has been paid to other ethnic groups.

Because food beliefs and behaviours are structured within cultural contexts defined by ethnicity, ethnic group research can highlight distinct socio-cultural food and diet patterns not captured in general surveys. Furthermore, ethnic-specific knowledge can inform public health.
strategies to improve the health status of all ethnic groups equitably.\textsuperscript{17} Early research of Tokelauan (Polynesian) children and adults, both in the islands and New Zealand, highlighted significant changes in food choices due to migration and number of years lived in New Zealand.\textsuperscript{18,19} Traditional island food staples of coconut, fish, taro and breadfruit were replaced with bread, cereals and meat, having a marked impact on nutritive and energy intakes. An increased variety of food choices compared with island foods was another important change. Poor access and cost of imported island foods in New Zealand were the main environmental determinants of the nutritional change.

More recent studies have found marked relationships between body mass index and specific behaviours, such as breakfast eating and purchasing of school food from dairy and takeaway stores among Pacific children (5–14 years) in particular.\textsuperscript{20} However, longitudinal food patterns for children of Pacific ethnicity have never been reported and this paper is an effort to address this lack in research.

Relationships between food frequency and body composition at age 4 years and growth from age 6 weeks to 4 years among children from the Pacific Islands Families (PIF) study, have been reported previously.\textsuperscript{21} At age 4 years, bread (1.32 times/day), milk (0.86), breakfast cereal (0.83) and apples or pears (0.83) were the four most frequently consumed foods. A majority of children drank standard (full-fat) milk (85%), ate white bread only (77%) and a small proportion rarely consumed milk at all (7%). The New Zealand Food and Nutrition Guidelines for healthy children and young people (2–18 years) recommended daily fruit consumption was achieved by 60% of children, but by only 35% for vegetable consumption. Only 5% reported eating traditional Pacific foods, such as taro and green banana, similar to the pattern seen in the earlier studies of Tokelauan migrants.\textsuperscript{18,19} This nutrition transition may be a contributing factor in the objectively measured rapid growth and high prevalence of overweight (70%) in this cohort at age 10 years.\textsuperscript{22}

The aim of this investigation was to report food frequency information of New Zealand-born Pacific children aged 4 and 6 years from the aforementioned PIF study. The objectives were to identify the foods being consumed before attending school (age 4 years) and one year after starting school (age 6 years) and to estimate tracking of consumption of food combinations. We hypothesised that consumption of similar foods would track and that, based on a high prevalence of overweight,\textsuperscript{21,22} a high frequency of energy dense foods (high in fat and/or refined carbohydrates) would persist across the two measurement periods (ages 4 and 6 years).

**Materials and methods**

Detailed descriptions of the birth cohort are presented elsewhere.\textsuperscript{23,24} Briefly, in 2000, 1,398 full-term babies (22 pairs of twins) were recruited via their mothers (n=1,376) at birth for the PIF study. A child was eligible if they were full-term and at least one of the birth parents identified with a Pacific Island ethnicity. At baseline, the child cohort represented between a quarter and one-third of all eligible children born in the South Auckland region in 2000. In 2013, over one-third (36.3%) of the total New Zealand Pacific resident population were in the local community board areas of South Auckland.\textsuperscript{25} The four main usually resident Pacific ethnic groups in New Zealand—Samoan, Tongan, Niuean and Cook Island Māori—were broadly represented in the original child cohort.

Families were first visited when the children were 6 weeks old, with follow-ups at ages 1, 2, 4, and 6 years. At the age 4 and 6 year assessments, 1,048 and 1,001 caregivers (representing 1,066 and 1,019 children respectively) were given a qualitative 111 item food frequency questionnaire (FFQ) used in the 2002/03 Children’s Nutrition Survey.\textsuperscript{26} (Three subsequent follow-ups have occurred since the 6 years assessment, but are not relevant to this investigation, as food frequency data was not collected).

The FFQ prompted caregivers to account the frequency of eating 111 food items “over the last 4 weeks” for their child. Possible responses were: “Never or less than once a month”; “1 to 3 times a month”; “1 to 2 times
“Once a day”; and “2 or more times a day”. Photographs representing standard serving sizes in the FFQ enabled caregivers to identify the types of foods consumed by their child.

Monthly and weekly frequencies of eating were transformed and reported as average daily consumption according to the weighting chart (Table 1).

Consumption was examined by food item (foods) and food group (Table 2), according the New Zealand Food and Nutrition Guidelines for healthy children and young people 2–18 years. Nutrient and energy density profile was ranked according to the British nutrient profiling score. Data extraction and manipulation was carried out. Descriptive statistics, including frequency, means and 95% confidence intervals, were determined. Proportions were compared using Chi-squared statistic and associations using Pearson correlation coefficient, r. Data was analyzed using R v.15.2 (http://cran.r-project.org). Levels of statistical significance were set at p<0.05.

Results

Of the total child cohort (n=1,398), the caregivers of 1,066 (age 4 years) and 1,019 (age 6 years) children were located and asked to complete the FFQ. From these caregivers, 907 and 801 FFQ were returned, corresponding to response rates of 64.9% and 57.3% at age 4 and 6 years respectively (Table 3). The caregivers of 646 children (327 female, 319 male) returned FFQ at both age bands and the results presented here are based on these FFQ. Analyses were confined to these FFQ so that individual (child) foods could be tracked reliably from one measurement period to the next. Probability values for bias in the distribution of respondents versus non-respondents using Chi-squared tests suggested no significant differences (p>0.05) between the two groups at any stage. This indicated that our sample was representative of our original baseline cohort. Due to the high number of variables (foods), our sample was too small to carry out analyses representative of the Pacific ethnic groups.

Table 1: Weighting chart. Food frequency and weighting factor used to standardise to daily consumption.\(^2\)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never or less than once a month</td>
<td>0.005</td>
</tr>
<tr>
<td>1 to 3 times a month</td>
<td>0.066667</td>
</tr>
<tr>
<td>1 to 2 times a week</td>
<td>0.214286</td>
</tr>
<tr>
<td>3 to 4 times a week</td>
<td>0.5</td>
</tr>
<tr>
<td>5 to 6 times a week</td>
<td>0.785714</td>
</tr>
<tr>
<td>Once a day</td>
<td>1</td>
</tr>
<tr>
<td>2 or more times a day</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2: Food groups. Classification of the 111 foods in the food frequency questionnaire by group and major nutrient, according to nutrient and energy density.

<table>
<thead>
<tr>
<th>Class</th>
<th>Total</th>
<th>Higher nutrient, lower energy</th>
<th>Lower nutrient, higher energy</th>
<th>Example of Lower nutrient, higher energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit and vegetable</td>
<td>27</td>
<td>26</td>
<td>1</td>
<td>Tomato sauce</td>
</tr>
<tr>
<td>Meat &amp; alternates</td>
<td>27</td>
<td>18</td>
<td>9</td>
<td>Sausage roll</td>
</tr>
<tr>
<td>Dairy</td>
<td>9</td>
<td>6</td>
<td>3</td>
<td>Cheese</td>
</tr>
<tr>
<td>Major nutrient</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fat</td>
<td>8</td>
<td>1</td>
<td>7</td>
<td>Mayonnaise</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>40</td>
<td>11</td>
<td>29</td>
<td>Biscuits</td>
</tr>
</tbody>
</table>
Table 3: Gender of children whose parents participated at age 4 and 6 years

<table>
<thead>
<tr>
<th>Participation at age 4 years</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%*</th>
<th>x² p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>444</td>
<td>65.2%</td>
<td>237</td>
<td>34.8%</td>
<td>0.81</td>
</tr>
<tr>
<td>Male</td>
<td>463</td>
<td>64.5%</td>
<td>254</td>
<td>35.4%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>907</td>
<td>64.9%</td>
<td>491</td>
<td>35.1%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participation at age 6 years</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>397</td>
<td>58.3%</td>
<td>284</td>
<td>41.7%</td>
<td>0.46</td>
</tr>
<tr>
<td>Male</td>
<td>404</td>
<td>56.3%</td>
<td>313</td>
<td>43.7%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>801</td>
<td>57.3%</td>
<td>597</td>
<td>42.7%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participation at both age 4 and 6 years</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>327</td>
<td>48.0%</td>
<td>354</td>
<td>52.0%</td>
<td>0.19</td>
</tr>
<tr>
<td>Male</td>
<td>319</td>
<td>44.5%</td>
<td>398</td>
<td>55.5%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>646</td>
<td>46.2%</td>
<td>752</td>
<td>53.8%</td>
<td></td>
</tr>
</tbody>
</table>

* Row percent

Figure 1: Association of average consumption per day of the top 12 most frequently consumed foods from age 4 to 6 years
Frequency of foods

Across both measurements, 12 most frequently consumed foods (the top 12 foods) were identified, with bread, breakfast cereal and rice representing the top three most frequently eaten foods (Figure 1). The top 12 foods accounted for up to 25% of all food consumed on average per day. Overall, frequency of consumption of the top 12 foods remained moderately stable ($r^2=0.53$) across the two measurement periods.

Of the top 12 foods, the average frequency of eating bread and rice was the least likely to have changed, both remaining close to equilibrium across the two measurement periods. On average, breakfast cereal was the only food to have increased from 0.8 to 1.0 per day by age 6. Overall, the eating frequency of the remaining nine of the top 12 foods decreased. For example, milk and fruit (apples and pears, oranges and mandarins, bananas) decreased substantially from 0.9 and 0.8 respectively at age 4 to 0.3 times per day at age 6.

At ages 4 and 6, chicken was the only meat item identified in the 12 most frequently consumed foods. Snack foods, such as crisps and noodles (eg, 2 minute Noodles), remained popular. Food drinks (eg, Milo™) and powdered fruit drinks (eg, Raro™), which have sugar as a major component, were also frequently consumed foods at both ages.

Frequency of food groups

From age 4 to age 6 years, the average daily consumption of food groups, was very stable ($r^2=0.96$) (Figure 2). The food group cereals and breads (26.5%) comprised the largest percentage of daily food portions across both measurement periods. Around one fifth of daily portions consisted of the meat and alternates (meats) food group, and a quarter consisted of the vegetables (~15%) and fruit (~10%) food groups.

Discussion

For the first time, our investigation has provided a longitudinal account of food frequency patterns for a cohort of children of Pacific ethnicity. Our objectives were to investigate the reported food frequency data of these children, to identify common foods and assess whether consumption patterns (similar foods) tracked.

We found that for both age bands, 12 food items represented the most frequently consumed foods comprising a quarter (25%) of food eaten every day. Across the cohort, the consumption frequency of these foods remained moderately stable ($r^2=0.53$). Further, in separate analyses (not shown), we found that within individuals, the 12 most frequently consumed foods tracked highly and the association across the age bands was strong ($r=0.72$; $p<0.001$).

Reported daily frequency of consumption in nine of the top 12 foods decreased.
Rice and bread remained stable, and only breakfast cereal increased. Overall, consumption within food groups tracked strongly \((r^2=0.96)\), cereals, breads and meats comprising nearly half of all daily food, followed by vegetables and fruit making a further quarter.

Based on a high prevalence (80%) of overweight and rapid growth among this cohort,\(^{22}\) we hypothesised an energy dense food pattern consistent with a high frequency of refined carbohydrates, fats and meats. Higher energy refined carbohydrates constituted around a quarter (26.1%; \(n=29\)) of all food in the FFQ where cereals and breads contributed to a quarter of all daily food. Bread was the single largest contributor of energy intake for all New Zealand children,\(^{26}\) reflected as the most frequently consumed food item in this investigation. Persistent consumption of white bread (85.5% at 6 years), rice and snacks across both age bands supports our hypothesis of an energy dense food pattern by way of refined carbohydrates.

In terms of the fats food group, daily intake was low (~2%) with higher energy fat foods comprising only 6.3% \((n=7)\) of FFQ items. As a result, this food group alone was not likely to contribute significantly to an energy dense food pattern. However, dietary fat may be derived from eating meats, dairy and ready-made foods, such as fried potatoes (crisps or hot chips), contributing some fat as energy intake. One-third of meats \((9/27)\) and dairy \((3/9)\) foods were classified as lower-nutrient/higher-energy foods, equivalent to 10.8% of all FFQ items. Meats constituted one-fifth of all daily food consumed at age 6. In separate analyses of the economic living standard index with the cohort, 41% of respondents reported buying cheaper cuts of meat with a higher fat content “a lot” to keep food costs down. Dairy foods made up around 9% of daily food by age six and the overwhelming milk of choice (91.2%) was the standard full-fat variety. Fat, dairy and meats constituted on average 30% of all food consumed daily, lending further support to our hypothesis of an energy dense food pattern via derived total fat intake.

A positive finding in our study may be the increased frequency of breakfast cereal consumption over the two measurement periods. In the Children's Nutrition Survey (CNS2002/03),\(^{26}\) breakfast consumption was shown to have a significant association with better nutrient intakes compared with non-breakfast consumption, yet Pacific children who consumed breakfast also had higher energy and carbohydrate intakes.\(^{30}\) Compared with other ethnic groups, Pacific children had the lowest levels of breakfast consumption and lack of breakfast was associated with a higher BMI.\(^{20,30}\) However, breakfast consumption was also negatively correlated with socioeconomic deprivation and age, such that older children (11–14 years) living in the most deprived circumstances were less likely compared with younger (5–6 years), less deprived children to consume breakfast.\(^{20,30}\) As most Pacific people live with high deprivation, the reported increase in the frequency of breakfast consumption in the latter age group is inconsistent with prior research.

However, our findings are consistent with current evidence of dietary patterns in studies comprising of predominantly Anglo-Saxon children, which point to a tendency for food patterns to track through childhood.\(^{11-14}\) In addition, the information gleaned from our investigation provides valuable knowledge about maternal/family feeding practices and prompts further questions around environmental factors that might contribute to food availability.

**Strengths and limitations**

One of the main strengths of this study is the longitudinal nature of the data, allowing identification of the most frequently consumed foods from age 4 to 6 years—a critical transition time from pre-school to after the first year at school. Regular measurement of consumption is necessary for reliable assessments of food patterns,\(^{31}\) since dietary habits are dynamic and shaped by environmental features including the growth of commercially-manufactured foods.\(^{32}\) Lastly, longitudinal dietary patterns provide valuable indicators of nutrition related chronic illnesses (eg, obesity and diabetes) throughout the life-course.

Another strength of our study is the comparatively high response rate, especially for an ethnic group characteristically known as “hard to reach”.\(^{33}\) Longitudinal
studies are challenged by natural attrition, resulting in missing participants, due to loss at follow-up. Missing participants include: families who have requested withdrawal; relocated from study location; become ineligible (eg, reported deceased); or excluded from analysis (eg, twin siblings). We report unconditional response rates where the denominator is based on the original sample of 1,398, yielding response rates of 64.9% and 57.3% (age 4 and age 6, respectively). Conditional response rates—where the denominator is based on number of participants contacted at follow-up (n=1,066; n=1,019)—were much higher, corresponding to 85.1% (n=907) and 78.6% (n=801) at age 4 and 6, respectively.

A limitation of our study is that despite some evidence of a high intake of energy dense foods, this study does not prove an association with obesity. We did not carry out a case-control study and neither was food frequency linked with weight status. Studies of this nature are anticipated in ongoing research within the cohort.

As with many nutrition surveys, another limitation of this study is that children’s food patterns were reported by proxy, via parents or caregivers. In this study, 98% (4 years) and 96% (6 years) of respondents were mothers. Although FFQ have good validity and reliability for measuring children’s food intake through parental reporting, parents have limited knowledge of food consumed outside of the home. Nevertheless, most foods eaten by children in this age group are obtained from within the home and any food consumed beyond the home setting would be minimal.

Our results show a reduction in nine of the top 12 foods by age 6, suggesting at least two contributing factors. Firstly, as children age, food frequency may be further dispersed across foods other than those most commonly consumed at age 4. However, there was no evidence of increases in consumption of all other foods and correlation coefficients show strong tracking of frequency of all food groups.

Secondly, regardless of frequency, increases in portion size of the more staple foods, such as bread, may be under-reported. The inability to accurately measure portion size is a well-known limitation of FFQs and respondents of FFQs are more likely to under-report overall food intake, whereas individual food items are subject to over-reporting.

Another potential limitation of this study is the age of the FFQ and data. Parental and children’s food options and choices may have changed since the time these data were collected. Therefore, these findings may not be representative of the foods that Pacific children consume currently. However, this is difficult to ascertain due to a lack of comprehensive surveys of children’s food intake since CNS2002/03. The current Food and Nutrition Guidelines for Children and Young People is based on CNS2002/03 which, as stated earlier, used the same FFQ as this study. Indeed, the surveys discussed here are the most recent large-scale food surveys for Pacific children in New Zealand.

Finally, we made no adjustments for potential seasonal variations in food availability, socioeconomic and demographic variables. Both surveys (4 and 6 years) were carried out over a period of 18 months, meaning that any variation in seasonal foods should have been partially compensated. Additionally, food storage, hot-house technology and importing allows for year-round availability of most fruit and vegetables, though imported and off-season foods can be more costly. Adjustments for socioeconomic status were not prioritised because the data were skewed at the lower end of the socioeconomic strata. At baseline, only a quarter (27%) of mothers had post-school qualifications and most households (92%) had incomes lower than NZ$50,000 per annum. In terms of demographic variables, there were no significant differences when adjusting for gender or ethnicity. However, more pertinent was establishing—for Pacific children—overall preschool food patterns and how well these foods and food groups tracked overtime. These factors are important for helping to explain the high prevalence of overweight and obesity across the cohort regardless of gender or ethnicity.

Conclusion

Our study showed that, for Pacific children living in New Zealand, from pre-school (age 4 years) to the second year of school (age 6 years), food choices and
frequency remained relatively consistent. Cross-sectionally and longitudinally, the same proportion of foods from each food group was consumed, where 12 foods accounted for one quarter of all food consumed daily. For Pacific children, the high intake of low fibre/nutrient content of the most frequently eaten white bread and rice, noodles and crisps, are what advocates and policy makers should address at this critical period of growth.

**Competing interests:** Nil  
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**URL:**  

**REFERENCES:**  


16. Kumanayika SK. Environmental influences on childhood obesity: ethnic and cultural influences in context. Physiol Behav. 2008 Apr 22;94(1):61-70


Eye health outreach services in the Pacific Islands region: an updated profile

Julianna Lees, Judith McCool, Alistair Woodward

ABSTRACT

BACKGROUND: Anecdotal reports indicate a decreasing number of patients presenting for assessment, and in particular a reduction in the number of patients requiring cataract surgery in Pacific Island Countries (PICs). Furthermore, research and routine surveillance is uncommon.

AIM: To analyse and describe the records of eye health outreach clinics from a single provider in seven Pacific Islands.

METHOD: Routine data collected at the Fred Hollows Foundation eye health outreach clinics in Fiji, Kiribati, Papua New Guinea (PNG), Samoa, the Solomon Islands, Tonga and Vanuatu between 2009 and 2013 were analysed.

RESULTS: Over the study period the number of patients treated per clinic fell in Fiji, Samoa and the Solomon Islands. Data from PNG show a higher mean number of patients per clinic and the numbers of patients presenting at PNG outreach clinics appears to be increasing. Cataract was the main eye health condition for between 40%–70% of visits overall, but this range varied between 14% (PNG) and 94% (Fiji). In all countries, males were more likely to receive cataract surgery than females. Refractive error was the most common presenting complaint at PNG outreach clinics; diabetic retinopathy was most common in Tonga. Cases of trachoma or trichiasis were identified in all countries, excepting Kiribati, Samoa and Tonga.

CONCLUSION: Data from outreach eye health clinics show marked differences between PICs in the most common presenting conditions. In three countries, it appears there has recently been a reduction in the overall number of patients presenting for treatment. Cautious interpretation of the data is required due to concern about data completeness and quality.

Visual impairment and blindness (VI/B) are well recognised as significant contributors to poor quality of life and reduced productivity. The World Health Organization (WHO) estimated that in 2010, there were 39 million people blind and an additional 246 million people visually impaired. In 80% of these cases the cause of blindness (B) and visual impairment (VI) is believed to be either treatable or preventable. Consistent with evidence of other sensory disability research, VI/B disproportionately affect people living in low and middle-income countries (LMIC). The WHO estimates that the prevalence of blindness is approximately 0.3% in high-income countries and likely to be greater than 1% in LMIC. Furthermore, VI/B affects a greater proportion of women than men; a 2001 meta-analysis estimated that women accounted for 64.5% of all blind adults worldwide. There is limited research and routine surveillance on eye health in Pacific Islands countries (PICs), resulting in fragmented understanding of ophthalmic epidemiology throughout the Pacific region. Where population surveys have been undertaken, they frequently only include adult populations, providing little or no information on childhood VI/B. PICs (Figure 1) have diverse cultures, religious affiliations, political histories, geography and resources. Despite their diversity, these countries share barriers to prosperity and economic success, including remoteness, political instability, lack of human resources and vulnerability to climate change and other natural disasters.

Eye care is delivered within the PICs by national health systems and private organisations, such as Fred Hollows Foundation New Zealand (FHFNZ). Other
providers have included Brien Holden Vision Institute, Marine Reach Ministries, the New Zealand Medical Treatment Scheme and the Royal Australasian College of Surgeons (RACS) Pacific Islands Project (PIP). Early population surveys indicate that cataract is the leading cause of blindness and one of the most common causes of VI in PICs. Surgery for this condition provides a fast, relatively inexpensive and low-risk method of restoring sight.

Opthalmology outreach services are necessary in parts of the Pacific region where geographic isolation, small populations and the lack of human and other resources mean that many people cannot access specialist health services. The standard model of outreach health service delivery in developing countries entails small teams of clinicians, both local and from overseas, working alongside eye-care nurses.

Anecdotal reports from clinicians involved with FHFNZ outreach clinics suggested that there may be a decreasing number of patients presenting for assessment, and in particular a reduction in the number of patients requiring cataract surgery.

Data collected during the outreach visits provide insight into the profile of presenting eye health problems in the region from the perspective of one provider and offer an opportunity to test whether there have been changes over time, and if so, what modifications may be required in the ophthalmic services in the region.

Materials and methods

Routine existing data (secondary data) collated at seven Pacific Island outreach clinics between 2009 and 2013 were analysed using Excel. Outreach clinics are defined as any clinic held outside the premises of designated program centers. Countries included in this analysis were Fiji, Kiribati, Papua New Guinea (PNG), Samoa, the Solomon Islands, Tonga and Vanuatu. Data were accessed—with permission from a regional eye health provider database—as Excel spreadsheets and written reports. Raw data were de-identified to preserve the anonymity of the patients. This project was exempt from requiring ethical approval by The University of Auckland Human Participants Ethics Committee (UAHPEC), as this study utilised secondary data collected by the FHFNZ and did not involve contact with human participants. This project was also released from requiring formal ethics approval by the Health and Disability Ethics Committee. The study adheres to the tenets of the Declaration of Helsinki in that the rights of all human participants are protected through the process of de-identification of data and ethical consideration in the analysis and reporting of data.

Diagnosis was coded as per the WHO guidelines for ‘primary diagnosis’, as the current outreach data do not allow for clear identification of the presenting issue or diagnosis, as opposed to concurrent
ophthalmic comorbidities. Additionally, all cases of trachoma and trichiasis were recoded, even in cases where this was not the primary diagnosis. Where Excel spreadsheets were not available, statistics were sought from written reports. Data were aggregated by country and year. Descriptive statistical analysis was then applied.

**Results**

In total, 67 outreach clinics were conducted in seven countries between 2009 and 2013.

Outreach data indicate that the mean number of patients seen at outreach clinics appear to be decreasing in Fiji, Samoa and the Solomon Islands (Figure 2). Data were not available for outreach clinics held in Kiribati in 2012 or the Solomon Islands in 2011. Data from PNG stand out for the high mean number of patients per clinic—even after accounting for the greater length of PNG outreach clinics. Additionally, the number of patients reviewed at PNG outreach clinics appears to be increasing, in contrast to other outreach locations. Notably, outreach clinics in PNG are run differently to those in other locations. PNG does not have locally-based Pacific Eye Institute trained ophthalmic nurses to undertake pre-outreach screening of patients. Therefore, ophthalmic nurses conduct screening simultaneously with medically run outreach clinics and additionally, clinics last for two weeks in PNG, as opposed to one week in all other locations.

The percentage of patients whose primary diagnosis is cataract is shown in Table 1.

---

**Table 1:** Percentage of outreach patients with cataract as primary diagnosis

<table>
<thead>
<tr>
<th>Clinic locations:</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>65.1</td>
<td>45.4</td>
<td>94.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiribati</td>
<td></td>
<td></td>
<td>59.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>14.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samoa</td>
<td>69.2</td>
<td>62.3</td>
<td>60.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>64.5</td>
<td>65.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tonga</td>
<td>54.9</td>
<td>55.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanuatu</td>
<td>41.1</td>
<td>53.4</td>
<td>48.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>58.5</td>
<td>56.1</td>
<td>56.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: No data available for any outreach sites from 2009 and 2010.
According to these figures, cataract typically contributes to between 40% and 70% of all primary diagnoses at outreach clinics. However, data from PNG in 2013 indicate that the proportion of patients with cataract as a primary diagnosis was considerably lower—only 14.1% of all patients reviewed. In contrast, clinics held in Fiji in 2013 had an unusually high proportion of cataract diagnoses. In this year, 94.2% of all patients seen at outreach clinics in Fiji had cataract disease as their primary diagnosis.

Table 2 illustrates the number of surgeries and the proportion of cataract surgeries performed in each outreach country between 2009 and 2013, according to all available outreach data. This information was not available for all of the outreach clinics during this period. Consequently, this table likely under-represents the true number of surgeries performed at FHFNZ outreach clinics. The proportion of cataract surgeries ranged from as low as 59.0% (Vanuatu, 2009) to 97.1% of all surgeries (Fiji, 2013). It should be noted that the changes observed for Fiji may be related to changes in service provider. In addition, there were no data for PNG and Kiribati.

Table 3 presents the proportion of all cataract surgeries that were performed on female patients. Data indicate that at most outreach locations, less than half of all cataract surgeries were performed on females. Notably, in 2013 in PNG only 30.4% of all cataract surgeries were undertaken on females.

Table 4 presents the percentage of patients whose primary cause of VI or B is an uncorrected refractive error (URE). Available data indicate that refractive
Table 4: Percentage of outreach clinic patients with uncorrected refractive error as the primary diagnosis

<table>
<thead>
<tr>
<th>Clinic locations:</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>6.8</td>
<td>33.7</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiribati</td>
<td></td>
<td></td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td></td>
<td></td>
<td></td>
<td>60.6</td>
<td></td>
</tr>
<tr>
<td>Samoa</td>
<td>2.8</td>
<td>7.3</td>
<td>9.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>2.6</td>
<td>2.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tonga</td>
<td></td>
<td>0.4</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanuatu</td>
<td>21.5</td>
<td>10.3</td>
<td>3.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: No data available for any outreach sites from 2009 and 2010.

Table 5: Percentage of outreach clinic patients with diabetic retinopathy as the primary diagnosis

<table>
<thead>
<tr>
<th>Clinic location:</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>1.4</td>
<td>0.2</td>
<td>0.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kiribati</td>
<td></td>
<td></td>
<td></td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Papua New Guinea</td>
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<td></td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Samoa</td>
<td>3.2</td>
<td>3.7</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>1.1</td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tonga</td>
<td>26.2</td>
<td>14.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanuatu</td>
<td>0.8</td>
<td>1.7</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: No data available for any outreach sites from 2009 and 2010.

Table 6: Trachoma cases by location: 2011 to 2013

<table>
<thead>
<tr>
<th>Clinic locations:</th>
<th>Number of patients</th>
<th>Proportion of cases seen</th>
<th>% Female</th>
<th>Mean age</th>
<th>% with BTR #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>2</td>
<td>0.1</td>
<td>100.0</td>
<td>38.7</td>
<td>0</td>
</tr>
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<td>Kiribati</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>35</td>
<td>0.1</td>
<td>51.4</td>
<td>65.3</td>
<td>90.0</td>
</tr>
<tr>
<td>Samoa</td>
<td>0</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>10</td>
<td>1.3</td>
<td>70.0</td>
<td>69.3</td>
<td>75.0</td>
</tr>
<tr>
<td>Tonga</td>
<td>0</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Vanuatu</td>
<td>4</td>
<td>0.6</td>
<td>50.0</td>
<td>69.3</td>
<td></td>
</tr>
</tbody>
</table>

* Fraction of clinics where trachoma was specifically recorded in outreach reports or where raw data was available for analysis.

# Bilamellar tarsal rotation—surgical treatment of trichiasis.
errors contribute a much greater proportion of cases of VI/B at outreach clinics in PNG compared to other locations. In 2013, 60.6% of all patients presenting to outreach clinics in PNG had a primary diagnosis of URE.

The proportion of patients at outreach clinics whose primary diagnosis is diabetic retinopathy (DR) is displayed in Table 5. Data are only available from 2011 onwards. DR accounted for less than 4.0% of primary diagnoses at most locations between 2009 and 2011. However, data from Tongan outreach clinics showed a much greater proportion of DR cases: 26.2% in 2012 and 14.2% in 2013.

All patients who were identified as having trachoma or trichiasis in outreach data were recorded (Table 6). This included cases where trachoma or trichiasis did not qualify as the primary diagnosis. Information on the stage of trachoma infection was not available in outreach data. No cases of trachoma or trichiasis were identified in data collected at outreach clinics in Kiribati, Samoa or Tonga. A total of 51 patients with trachoma or trichiasis were identified between 2009 and 2013. The majority of these cases (35 people) were identified at a single outreach clinic in PNG. Notably, 90% of all cases in the Solomon Islands underwent surgical correction for trichiasis.

**Discussion**

Preventable vision loss remains a persistent public health concern in the Pacific Islands region. Contextual factors, including the vast geographical isolation, chronic shortage of eye nurses and ophthalmologists and, to some extent, a weak primary health sector, contribute to the burden faced by the region.

Detailed studies of the epidemiology of eye conditions have been carried out in a small number of PICs, but these are costly and alternative approaches need to be considered. Analysis of routinely collected clinical data cannot replicate the full understanding gained from dedicated population-based eye health surveys. However, as this paper illustrates, using the activities of a single eye health provider can be an efficient means to capture the profile of presenting cases, to understand in broad terms patient demography and to identify 'hot spots' of infectious diseases, for example, trachoma. This method is particularly promising when there is an agreement between local health systems and NGO eye health providers to share data.

At present, it is difficult to confidently establish how many organisations are providing eye health services in PICs, the quality of these services, and what impact services are having on the burden of eye disease in the Pacific.

This situation is exacerbated by the paucity of detailed ophthalmic epidemiology data from Pacific Island countries. Moreover, maintaining responsive databases is prohibitively expensive and must compete with other health care demands.

Data generated at outreach clinics may provide an on-going flow of information to support surveillance of eye health in the region. These records can be used for clinical surveillance to monitor the changes seen in disease presentations over time and across locations, and in this way assist eye health teams to evaluate their work and assist with planning and the prioritisation of resources for outreach services. Outreach eye health services tend to be provided by regional NGOs or by sporadic visiting international medical teams, possibly leading to minimal follow-up and no clear accountability to national or regional agencies. Therefore, linking the various individual and NGO eye health service data to national (and regional) health information systems may greatly enhance data quality.

A commitment to the collection and open reporting of outreach data by eye health service providers in the Pacific will allow more accurate prediction of emerging trends in the ophthalmic health of PICs. This is of great importance for monitoring the changes in disease presentations, particularly as PICs transition toward a greater burden of non-communicable diseases. It is likely in the future there will be greater numbers of patients presenting with cataract, DR and hypertensive retinopathy. Eye health teams can also contribute key data to determine access to eye health services for vulnerable groups, such as women, children, elderly and ethnic minority groups. This information
provides in-country government agencies and visiting ophthalmology teams a clearer profile of groups with poorer access to eye health services and supports the development of strategies to address disparities.

Data collected from Pacific outreach eye health clinics between 2009 and 2013 indicate presentations at outreach clinics decreased in three out of the seven counties surveyed (Fiji, Samoa and the Solomon Islands). Several explanations are viable here: a decline in the number of patients due to a diminishing backlog of cataract-induced VI/B; changes to the number and/or type of clinicians at outreach clinics; or cataract prevalence may remain high, but patients are not presenting to outreach clinics for treatment. Alternatively, the changing disease profile in the region may mean patients are not presenting as their conditions are largely asymptomatic, undermining the reason and certainly the urgency of presenting to an outreach clinic.

Of note, our data also showed high numbers of URE cases were reported in PNG—a condition associated with poor access to primary eye health services. Tongan clinics are notable for the high number of DR cases reported, consistent with the high prevalence of diabetes in that country. Also, our findings indicate that between 2009 and 2013, in most locations, more men than women underwent cataract surgery, although most studies find a higher prevalence of cataract amongst women in developing countries.

Likewise, clinical surveillance is critical for providing an estimate of the burden of trachoma in PICs in the absence of up-to-date survey data on the prevalence and effects of trachoma in PICs. Collaborative use of clinical data from outreach clinics could provide an insight into where trachoma infections are prevalent or where a greater proportion of infections are progressing to VI/B. Eye health teams should also consider using ‘negative reporting’ to ensure that all cases of trachoma are identified, given the drive to see blinding trachoma eliminated globally and the current lack of information on its prevalence and effects in the Pacific.

Our analysis of outreach data provides evidence of the importance of investing in robust and reliable data collection systems that prioritise accountability and transparency. We argue that bold innovation and collaboration in data collection, reporting and sharing mechanisms are essential in resource scarce settings. In the absence of this, we will continue to be prone to speculation about the shifting burden of eye health and disease in the region.

Conclusion

Analysis of one eye health service providers’ data from outreach clinics across seven PICs from 2009 to 2013 indicates a reduction in the number of patients presenting for treatment. This trend, and others reported here, should be interpreted cautiously due to concern about data completeness and quality. Also, these data relate to those who present after (in most countries) screening by the eye care nurses. We have no information on those who may suffer from eye health problems, but do not present to clinics.

A commitment to quality data management and surveillance strategies for all eye health outreach programmes is vital to ensure resources are reaching those who need it, that health equity lies at the core of the efforts to deliver eye health services and finally, that innovation and collaboration are essential components of Pacific regional eye health initiatives.
ARTICLE

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URL:

REFERENCES:
21. Watters DA, Ewing H, McCaig E. Three phases...


Mā mahi, ka ora: by work, we prosper—traditional healers and workforce development

Annabel Ahuriri-Driscoll, Amohia Boulton, Albie Stewart, Gill Potaka-Osborne, Maui Hudson

ABSTRACT

AIM: Rongoā Māori practitioners make a valuable contribution towards Māori health outcomes, albeit with limited resourcing or formal training. This paper reports on a survey of healers/healing practices—specifically healers’ aspirations for professional development and training—and considers the implications for healing practice and future training undertakings.

METHODS: Healers in seven districts around the country were surveyed about rongoā practice and service delivery during 2013. Consenting healers completed surveys either in person, via phone, or returned them via post, according to their preference and convenience. Resulting data were analysed and reported according to frequency of responses.

RESULTS: Thirty-eight healers/rongoā clinics completed the survey—a 79% response rate. Respondents were primarily Māori (88%), female (69%), aged 50 years or older (60%), and worked as volunteers. Informal training modes focused on te reo, mātauranga and tikanga were the most common means of skill/knowledge acquisition, and preferred modes for further training.

CONCLUSIONS: The survey highlights the pressing need for expansion of the rongoā Māori workforce and training/service funding, to sustain rongoā practice. The findings add to what little is known about the training pathways and aspirations of practising healers, identified targets of the Māori Health Workforce Development Plan 2006.

NOTE: REFER TO GLOSSARY AT THE END OF THIS ARTICLE FOR MĀORI TERMS

Māori participation in the health and disability workforce is a key strategy for Māori health development.1-7 The employment of Māori within health services is a key aspect of improved responsiveness; by recognising the significance of culture to health and adopting appropriate language, custom and outcome measures, Māori health workers are more likely to ‘actively engage’ Māori consumers.8 Typically, Māori health workforce development is focused on Māori representation within allopathic medicine/allied health disciplines. Māori currently comprise 5% of the total regulated health workforce, despite making up approximately 16% of the total population.4 However, Māori health workforce development applies equally to ‘culturally constituted’ roles or functions, which also make a valuable contribution towards Māori health outcomes (eg, the ‘cultural’ intermediary role of Māori community health workers6,11). The rongoā Māori practitioner (tohunga rongoā, puna ora) is one such role. Rongoā Māori is a holistic system of healing derived from Māori philosophy and customs, comprised of several distinct healing modalities.12-15 Its application varies, according to healer attributes, skills and connection to the surrounding environment.16 Precise numbers of healers are not known,14,17 although in 2007 there were 48 rongoā practices nationwide affiliated
with the healer-led network Ngā Ringa Whakahaere o te Iwi Māori (NRW). In 2011, these healers merged with another healing collective (Te Paepae Matua) to form Te Kāhui Rongoā Trust (TKR), a new national rongoā governance body comprised of ten rongoā networks around the country (see Figure 1). TKR members were surveyed regarding their modes of practice and funding/contracting arrangements—both ‘formal’ and ‘informal’—for a current Health Research Council-funded project ‘Supporting Traditional Rongoā Practice in Contemporary Health Care Settings’. The aim of this paper is to report on the survey findings related to healers’ aspirations for professional development and training, which emerged as a key focus.

**Method**

A survey to gather data on current rongoā practice and service delivery was designed, drawing on team members’ knowledge, a literature review and key informant interviews.

Both open-ended and multiple answer questions were utilised to explore practitioner demographics, organisational/practice structure, services/healing modalities provided, current contracts/funding, trainin/expertise and collaborative relationships. The survey form was finalised in June 2013 and piloted in the Tairāwhiti rohe rongoā network. One of the team members, who also happened to be the Chair of the TKR, was able to approach...
the various rongoā providers individually and seek their consent for involvement. He then assisted healers to complete the survey, face-to-face. Survey data were entered into spreadsheets, ‘cleaned’ and compiled into frequency tables. The results were then reported back to the Tairāwhiti rohe members. With survey participants’ permission, these analyses were shared with healers from six other rohe (Kahungunu, Waiariki, Whanganui, Taranaki, Te Ūpoko o te Ika and Kāi Tahu), where access to rongoā meetings was granted.

The pilot affirmed the survey questions and format. Given the lack of change between the pilot and full survey administration, the pilot results are included in the final analysis. It was not possible to replicate the pilot approach in the remaining rohe however. The recruitment strategy employed varied based on geographical proximity of the rohe relative to research team members, familiarity with rohe tikanga. In Taranaki, surveys were completed at several hui attended by research team members, over a course of some months. In other regions, individual TKR rohe representatives with whom the research team had positive personal relationships, surveyed rongoā practitioners on the team’s behalf.

Although research team members working alongside healers in person to complete the survey proved the most efficacious way of achieving survey completion, this was not always possible. Subsequently, some surveys were undertaken by phone, or self-administered and returned via post, depending on convenience and healers’ preferences. In keeping with the scoping focus, all self-identified practising healers affiliated with regional rongoā network/s were invited to participate. These included those serving whanau/community on a donation basis, contracted providers, healers working individually and with others. Collectives were asked to identify one person (preferably of a senior/management position) to complete the survey on behalf of their colleagues, conferring with other staff where necessary to complete relevant sections of the form.

### Results

By January 2014, a total of 38 surveys across the seven local networks had been received. Non-comparable denominator data complicates the calculation of a response rate. For election purposes, TKR’s membership includes non-practising rongoā supporters. Based on sector advice, the NRW affiliates list is the most accurate account of active practices/practitioners. Using this as the healing population denominator, completed surveys (38/48) represent a 79% response rate.

### Demographics

Thirty-eight rongoā practices responded to the survey, encompassing 173 indi-

---

**Table 1: Numbers of individuals working within respondent rongoā practices**

<table>
<thead>
<tr>
<th>Number of staff</th>
<th>Number of practices</th>
<th>Total staff members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>12</td>
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</tr>
<tr>
<td>5</td>
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<td>10</td>
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<tr>
<td>10</td>
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</tr>
<tr>
<td>11</td>
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<td>11</td>
</tr>
<tr>
<td>45</td>
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<td>45</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38</strong></td>
<td><strong>173</strong></td>
</tr>
</tbody>
</table>
Table 2: Survey respondents by gender, age group and role/position

<table>
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<th>Age</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Tohunga/principal healer</td>
<td>Support role</td>
<td>No answer</td>
</tr>
<tr>
<td>15–19</td>
<td>0</td>
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</tr>
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</tr>
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</tr>
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<td>No answer</td>
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</tr>
<tr>
<td>Female Total</td>
<td>39</td>
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<td>5</td>
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<td>Tohunga/principal healer</td>
<td>Support role</td>
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</tr>
<tr>
<td>15–19</td>
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<td>2</td>
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<td>20–29</td>
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<td>80+</td>
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<tr>
<td>Total</td>
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<td>101</td>
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</tr>
</tbody>
</table>

Individuals. The numbers of individuals working within each rongoā practice ranged between one and 45, with two-thirds of respondent practices consisting of between one and three healers (see Table 1). Although the age range of those involved in respondent practices spanned 15–80+ years, those aged 50–59 years accounted for the largest proportion of respondents (26%), followed by those aged 60–69 years (20%). Over two-thirds (69%) of respondents were female, and the large majority (88%) identified as being of Māori ethnicity. Staff in 34 rongoā practices (89%) identified having whakapapa affiliations to local iwi in their areas of practice. Respondent rongoā practices were fairly evenly distributed between rural and urban locations (20 and 19 respectively; one practice working across both).

Over a third (38%) of those working within respondent rongoā practices (n=173) described themselves as tohunga/principal healers: just under two-thirds of tohunga/principal healers (n=65) were aged 50 years and older and were female (63% and 64% respectively, see Table 2). However, women were also more likely to work in supporting positions, comprising three-quarters of kaimahi, kaiāwhina, kaiwhakahaere and whānau assistants. In terms of employment status, fifteen percent of respondents to this question (n=162) identified as full-time workers, 13% as part-time workers, half (53%) as volunteers, and the smallest proportion (six percent) were paid employees—several of the latter noted.
Table 3: Survey respondents by gender, age group and employment status

<table>
<thead>
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<th>Female</th>
<th>Age</th>
<th>Full-time</th>
<th>Casual/ part-time</th>
<th>Volunteer</th>
<th>Paid employee</th>
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<td>9</td>
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<td></td>
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<td>22</td>
<td>86</td>
<td>10</td>
<td>17</td>
<td>12</td>
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</table>

being paid from forms of work other than *rongoā* (see Table 3). No principal healers were paid employees—the majority (69%) reported being volunteers.

**Types of training**

Informal, culturally-embedded training was the means of skill/knowledge acquisition most commonly cited by respondents. Participation in *hui/wānanga* and mentoring with elders were noted by over half of respondents (n=70, 64% and 59% respectively), and ‘*nga atua kaitiaki*’ (spiritual guidance provided by guardian ancestors) and *iwi/rūnanga/marae*-based modes were noted by over a third of respondents (39%). Formal training modes were reported by fewer respondents in comparison, although university/college and private training institutions were noted by over a third of respondents (36% and 41% respectively). Nearly a third of respondents (29%) reported only one mode of training and 37% noted between two and three modes of training. Nearly a quarter of respondents (22%) reported between six and eight different training modes.

*Te reo, mātauranga* and *tikanga*, followed by health/hauora were the most common subject areas cited by respondents, 74% and 59% respectively. Education/teaching, environmental management and business management were cited by more than a quarter of respondents. Approximately a third of respondents (n=70, 34%) reported training in one subject area, and a further third (35%) noted between two and three subject areas. Over a quarter of respondents (27%) reported between four and six different subject areas.
In general, tohunga and kaumātua report informal modes of training at higher levels than other roles/positions. Those in kaiwhakahaere positions are more likely to have formal training, presumably related to their business, management or administrative roles, however respondents in these positions were also highly likely to have undergone ‘cultural’ forms of training. Kaumātua were least likely to have engaged in formal training, perhaps a reflection of both age and historical educational context.

### Discussion

#### Rongoā Māori workforce composition

The demographics of respondent healers correspond broadly with those described in previous studies. Parsons (1995)\(^{14}\) and Jones (2000)\(^{15}\) point to healing being practiced more often by older Māori living in rural areas. Consistent with these accounts, our survey sample was predominantly—but not exclusively—Māori, and over half (60%) were aged 50 years or older. Broad generalisations drawn by O’Connor\(^{17}\) about healers fit this ‘traditional’ demographic profile include: a distance from ‘mainstream’ medicine and health/government authorities; a belief in healing as a ‘God-given’ gift; and operation on a koha/donation basis.

On the contrary, our respondents were fairly evenly distributed between rural and urban locations, and as part of TKR, are engaging with the Ministry of Health (MoH), some contracted (12 currently, 16 previously) to provide rongoā Māori services.

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#### Table 4: Modes of training according to designated role/position

<table>
<thead>
<tr>
<th></th>
<th>Informal training</th>
<th>Formal training</th>
<th>Other</th>
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<tr>
<td></td>
<td>Hui</td>
<td>Iwi/marae-based</td>
<td>Elders</td>
<td>Ngā atua kaitioki</td>
</tr>
<tr>
<td>Tohunga/principal healer</td>
<td>13 (65%)</td>
<td>7 (35%)</td>
<td>15 (75%)</td>
<td>8 (40%)</td>
</tr>
<tr>
<td>Kaimahi/kaiawhina</td>
<td>17 (65%)</td>
<td>11 (42%)</td>
<td>13 (50%)</td>
<td>8 (31%)</td>
</tr>
<tr>
<td>Whānau assistant</td>
<td>3 (60%)</td>
<td>1 (20%)</td>
<td>3 (60%)</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>Kaiwhakahaere</td>
<td>4 (67%)</td>
<td>2 (33%)</td>
<td>3 (50%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>Kaumātua</td>
<td>7 (78%)</td>
<td>4 (44%)</td>
<td>6 (67%)</td>
<td>6 (67%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (25%)</td>
<td>2 (50%)</td>
<td>1 (25%)</td>
<td>1 (25%)</td>
</tr>
<tr>
<td>Total responses</td>
<td>45 (64%)</td>
<td>27 (39%)</td>
<td>41 (59%)</td>
<td>27 (39%)</td>
</tr>
</tbody>
</table>

In general, tohunga and kaumātua report informal modes of training at higher levels than other roles/positions. Those in kaiwhakahaere positions are more likely to have formal training, presumably related to their business, management or administrative roles, however respondents in these positions were also highly likely to have undergone ‘cultural’ forms of training. Kaumātua were least likely to have engaged in formal training, perhaps a reflection of both age and historical educational context.

#### Further training

A high proportion of those who responded to a question about further training (n=60, 85%) answered in the affirmative. Informal, culturally-embedded training modes were most preferred, noted by between a quarter and over half of respondents. In contrast, formal training via secondary school or private training institutions was preferred by between only two and 12% of respondents. Significantly, nearly a quarter of those who ticked options for further training (n=51, 24%) were interested in undertaking this in a university or college. The highest proportion of those who identified subjects for further training (n=48, 67%) expressed a desire to further their learning of te reo, mātauranga and tikanga. Business management, environmental management and health/hauora were identified by 22%, 30% and 38% of respondents respectively. Environmental management was the one area in which respondents’ interest in further training exceeded levels of previous training.
In this sense, a number of our respondents resemble a second group identified by O’Connor—those who are less averse to accepting money for their healing services, common in urban and rural areas, of a wider range of ages, and who attract more non-Māori clientele.

Previous research has not made specific mention of gender composition, apart from acknowledging that both men and women may be expert tohunga rongoā.7,20 The fact that our sample was primarily female may reflect both the predominance of women in many regulated and non-regulated health workforce occupations,21,22 higher rates of paid employment among Māori men23 and higher rates of unpaid work among Māori women more likely to be out of the labour force while child-rearing.24 Similarly to O’Connor’s findings, only a very small proportion of our survey respondents are paid for their healing work. The majority are volunteers who work on a part-time or casual basis, around other family/community roles and responsibilities and other forms of employment.

The demographic features of the healing community have a number of implications for the sustainability of rongoā. The healing workforce is older than the general working population, and indeed the health workforce.21,25 The aging pattern means there is potential for a large proportion of older workers to leave the workforce taking their knowledge and experience with them.26 The lower numbers of men involved in healing are not necessarily a problem for sustainability per se, but there are a number of gender-specific aspects of tikanga and rongoā that benefit from male input. Most significantly, financial constraints resulting from the largely unpaid work of healers and limited service funding (approximately $1.9 million per year, across 16 MoH contracts23) impact upon the capacity of healers to invest in strengthening and developing their practice.23 Healers and communities will often utilise their personal resources to do so.

Workforce/professional development and training

In earlier research, healers have distinguished between the deep knowledge and spiritual connection of tohunga, and the more practical skills application of kaiāwhina.24 This would suggest differing training and education needs for different roles. However, survey responses show less striking differences than might be expected. Tohunga/principal healers and support roles report a very similar range of training modes and subject areas (between one and three training modes and subject areas for nearly three-quarters of both groups). There are two surprising findings however: 1) a higher proportion of tohunga reported having attended university/college/polytechnic/wānanga; and 2) a higher proportion of those in support roles reported training in te reo, mātauranga and tikanga Māori. Furthermore, although similarly large proportions of tohunga and supporting staff indicate interest in further training (89% and 86% respectively), tohunga/principal healers reported higher levels of interest in all training modes (informal, culturally-based and within formal institutions) and subject areas. These findings challenge two common assumptions: that tohunga rongoā, having reached the pinnacle of healing knowledge, will be less interested in further learning; and also that healing associates/support staff might be less proficient culturally. Alternatively, it may be that these healing roles and distinctions are changing over time, impacted by changes in wider Māori society, or that our conflation of the terms tohunga and principal healer has biased responses.

Another possibility is that the emergence of Whare Wānanga—in which formal training programmes based in a Māori worldview are delivered predominantly by Māori—has increased the appeal of formal tertiary education. What is clear, given the diversity of respondents’ training backgrounds andprofessed interests in further development, is that there is no single pathway that necessarily reflects or will meet all rongoā practitioners’ needs.

Having said that, apprentice-style learning with other healers prevailed over formal education, as a mode of prior training and a priority for further training. This pattern is consistent with decentralised ‘traditional’ modes of transmission, in which a capacity for healing identified in young people was nurtured by elders, and the requisite knowledge passed on orally.16,27 Accord-
ingly, knowledge of *te reo*, *mātauranga* and *tikanga* was deemed the highest priority for further training, emphasising the foundation of *rongoā Māori* in a Māori worldview, and deep cultural knowledge. Considering that over half of respondents reported health expertise, there was less interest in this area as a focus for future study than might have been expected. Significant interest in environmental management and business/management perhaps reflects recognition by healers and practices of the business acumen required for *rongoā Māori* service development and delivery, and the importance of the natural environment in terms of sustaining the practice.

How best to support healers’ training aspirations has been the focus of discussion and a number of initiatives in recent years. Healers have advocated for a dual system, drawing on *tikanga* cultural guidance and support from healers, *iwi* / hapū/whānau structures, supplemented by institution-based curricula and certification. Programmes such as these acknowledge healers’ qualification within their own cultural and professional traditions, provide the requisite Māori community mandate to practise, and also align with non-Māori expectations. A number of *rongoā* training partnerships have been established between *iwi* and educational institutions and are attempting to balance theoretical learning with practical experience.

Despite the widespread interest in further learning, established and trainee *rongoā* practitioners are likely to differ in terms of their educational needs. For example, in a recent review of the non-regulated Māori health (*kaiawhina*) workforce, *kaumatua* *rongoā* practitioners reported a preference for short workshops complementing their skills and standards to enhance service delivery, rather than structured career development. On the other hand, encouraging young people to move into health workforce development programmes requires that there is financial assistance to complete further education, and clear career pathways/training infrastructure. However, healers cite subsistence level resourcing as a key feature of *rongoā* practice; this is an issue for the non-regulated health workforce in general. Indeed, the non-regulated status of the healing workforce has been identified by the MoH as a key reason for curtailing *rongoā* service contracting.

**Limitations**

As an indigenous healing tradition, *rongoā Māori* is not a practice that lends itself to investigation by quantitative means. Thus, the present survey has several limitations. Firstly, healers opted to participate in the survey rather than being randomly selected; the sample is therefore subject to response bias. Furthermore, incomplete coverage in terms of participating healing networks and small numbers of responses from some areas raise questions about the representativeness of the sample and limit the generalisability of findings. Accuracy of reporting may also have been affected in practices where a respondent answered on behalf of fellow healers/practitioners, and/or that person did not possess knowledge of some of the specific areas surveyed. We have identified that this may have been the case with contracting questions, which require relatively detailed administrative knowledge. Consequently, we have taken care to not overstate the significance of the results. Notwithstanding these limitations, this is the first study of its kind, examining the breadth of *rongoā Māori* practice and service delivery.

**Conclusion**

*Rongoā Māori* is a *taonga*, guaranteed Crown protection within *Te Tiriti o Waitangi/The Treaty of Waitangi*. At the heart of *rongoā* are its practitioners, and integral to their retention and recruitment are their training/development needs and aspirations. Corresponding with reports of growth in demand, the survey results highlight the growth desired by healers in terms of knowledge and skills underlying the healing and services they provide. Proficiency in the pillars of Māori knowledge (*te reo, tikanga* and *mātauranga Māori*) remains the core of *rongoā Māori* expertise. However, skills to enhance health system-based service delivery are also deemed important by healers. Positively, these dual priorities are reflected in the most recent government strategies for Māori non-regulated health workforce development.
Formalisation of rongoā through registration, accreditation, monitoring and evaluation is surmised by the Waitangi Tribunal as the primary means by which additional funding for rongoā will be granted within the health sector. Healers are finding their way forward through these issues via TKR, as an authoritative national rongoā body. Following a rohe-based approach, TKR has produced tikanga standards for practice, and in its governance exhibits grounded, professional leadership. It is with the rongoā sector that discussions of the implications for healer training currently lie. Survey findings have been provided to each of the rohe to support and inform any such discussions.

### GLOSSARY

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>hapū</td>
<td>kinship group, clan, sub-tribe</td>
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<tr>
<td>hauora</td>
<td>health</td>
</tr>
<tr>
<td>hui</td>
<td>meeting, gathering</td>
</tr>
<tr>
<td>iwi</td>
<td>extended kinship group, tribe, large group of people descended from a common ancestor</td>
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<tr>
<td>kaiwhakahaere</td>
<td>administrator, director, manager</td>
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<td>kaiāwhina</td>
<td>helper, assistant, contributor</td>
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<tr>
<td>kaimahi</td>
<td>worker, employee, staff</td>
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<td>kaumātua</td>
<td>elder, elderly man, elderly woman, a person of status within the whānau</td>
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<tr>
<td>koha</td>
<td>gift, present, offering, donation, contribution</td>
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<tr>
<td>Māori</td>
<td>the indigenous people of Aotearoa, New Zealand</td>
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<tr>
<td>mātauranga</td>
<td>knowledge, wisdom, understanding, skill</td>
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<tr>
<td>mahi</td>
<td>work, activity</td>
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<td>marae</td>
<td>meeting area of whānau or iwi, focal point of settlement, central area of village and its buildings</td>
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<tr>
<td>ngā atua kaitiaki</td>
<td>guiding spirits</td>
</tr>
<tr>
<td>puna ora</td>
<td>literally spring of wellness</td>
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<td>rohe</td>
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<td>rongoā</td>
<td>remedy, drug, cure, medication, treatment</td>
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<td>rūnanga</td>
<td>tribal council</td>
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<tr>
<td>taonga</td>
<td>treasure, item or attribute of great value</td>
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<tr>
<td>te reo</td>
<td>Māori language</td>
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<tr>
<td>tikanga</td>
<td>customs, traditions</td>
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<tr>
<td>tohunga</td>
<td>skilled person, chosen expert, priest</td>
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<tr>
<td>tohunga rongoā</td>
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<td>wānanga</td>
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<td>whānau</td>
<td>extended family</td>
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<tr>
<td>Whare Wānanga</td>
<td>a publicly owned tertiary institution that provides education in a Māori cultural context</td>
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REFERENCES:


Factors associated with nutrition risk in older Māori: a cross sectional study
Carol Wham, Eruera Maxted, Ruth Teh, Ngaire Kerse

**ABSTRACT**

AIM: To investigate factors associated with nutrition risk among older Māori.

METHOD: Māori aged 75–79 years living in the Northland and Bay of Plenty regions of New Zealand were assessed for nutrition risk using the validated screening tool 'Seniors in the Community: Risk Evaluation for Eating and Nutrition' (SCREENII). Demographic, physical and sociocultural data were collected.

RESULTS: Of the 67 participants, two thirds (63%) were identified to be at high-risk for malnutrition. More than half (56%) used te reo Māori (Māori language) for everyday conversation and those who rated language and culture as moderately important to wellbeing were at lower nutrition risk. Controlling for age, gender and living arrangements, participants who rated traditional foods as important, were able to access them, had a higher waist-to-hip ratio and an absence of depressive symptoms, were at lower nutrition risk.

CONCLUSIONS: Cultural factors associated with nutrition risk are related to an indigenous view of health. Participants with a higher waist-to-hip ratio were at lower nutrition risk and this may be a protective factor for older Māori. Interventions to improve the nutrition status of older Māori need to be based on a holistic Māori worldview and acknowledge the importance of traditional Māori foods.

The number and proportion of older Māori aged 65 years or more is growing. In 2006, Māori made up 6.8 percent of the older population in New Zealand and by 2026 it is predicted Māori will comprise 9.5% of older people. Of Māori who reach age 75, many have multiple health problems, but may not have readily available whānau (extended family) to care for and support them due to the migration of whānau members from rural to urban areas—often for employment. Few Māori reach 85 years of age (<0.2% of the Māori population) and 80 to 90 years represents advanced age for Māori.

National surveys indicate Māori over the age of 50 have significant inequalities in health outcomes and a higher burden of chronic illness compared with non-Māori of the same age. In 2006, a quarter of Māori aged over 50 years lived in the most deprived areas and therefore more likely to live lives challenged with less economic wealth and resources. Among Māori aged 65 to 69 years, only a third have average material living standards and 32% of single people and 22% of couples live in hardship. Māori over the age of 65 years have a high level of mobility-related disability and are more likely than non-Māori to have high support needs. In 2006, life expectancy at birth lagged by 7 years for Māori, however the Māori population is growing faster than the non-Māori population, thereby potentially expanding the population of older Māori. The nutritional status of older Māori is unknown. Older people in general tend to be at higher risk of malnutrition, but there are limited data on older Māori because they are underrepresented in surveys. Poor nutritional status is related to an increased risk of developing health problems. Higher patterns of morbidity occur in malnourished older people and increased functional difficulties, cognitive decline and comorbidities may all lead to malnutrition in advanced age. Screening for nutrition...
**ARTICLE**

**Method**

This cross-sectional study examines nutrition risk in older Māori from two regions of New Zealand: the Bay of Plenty (as part of the feasibility study for LiLACS NZ\(^{18,19}\)), and in Northland, where a second group of older Māori participants were recruited to extend the study sample and increase the generalisability of results to Māori.

**Bay of Plenty participants**

There were a total of 186 older people invited to participate in the feasibility study for LiLACS NZ and 112 participants were recruited (response rate 60%). Of these, 79 were non-Māori and 33 were Māori. For Māori, the inclusion criteria was aged 75 to 79 years old (birth date between 1 January, 1929 and 31 December, 1933). For all other ethnicities, birth date was between 1 January and 31 December 1922, 85 years. Younger Māori participants were recruited, as the gap in life expectancy between Māori and non-Māori was 8.2 years for men and 8.8 years for women.\(^{20}\)

*Whānau* and local networks were used to invite Māori who fitted the age criteria in the Rotorua, Whakatāne and Ōpōtiki areas. All people within the age range were eligible. Support of local general practitioners was sought, especially to identify any participants who might be too unwell to be invited to participate in the study. Overall, 45 Māori were invited to participate, 12 declined and 33 agreed (an overall response rate of 73%). There were 20 participants living in Rotorua, 8 in Whakatāne and 5 in Ōpōtiki.

**Northland participants**

In Northland, potential participants were sought from the Northland District Health Board patient management system, the Te Tai Tokerau Māori Electoral Roll, the Māori community, iwi/hapū groups, church groups, Māori non-government organisations, sporting and other social groups. To ensure the participation of ‘healthy’ Māori the inclusion criterion at enrolment for the Northland Māori was no hospital admission in the previous six months and enrolled on the Te Tai Tokerau Māori Electoral Roll. For the Northland Māori participants, the age criteria were the same as the Bay of Plenty participants: birth date...
between 1 January 1929 and 31 December 1933, aged 75 to 79 years.

A total of 44 community-living Māori, aged 75 to 79 years, living in Te Tai Tokerau/Northland, who met the eligibility criteria were approached and 34 agreed to participate (response rate 75%). Data from 33 Māori participants from the Bay of Plenty region—engaged in the feasibility study—were combined with the Northland sample.

Ethics approval was granted by the Northern X Regional Ethics Committee in May 2011. All participants provided written informed consent.

**Questionnaire**

Demographic data and responses to validated questionnaires were ascertained during face-to-face interviews by trained Māori interviewers in the Bay of Plenty and a Māori dietitian interviewer in Northland. The questionnaire was translated into *te reo Māori* (Māori language) and Māori interviewers were fluent in *te reo*. Interviews were conducted in the participant’s home or a local clinic, depending on participant’s preference.

**Measures**

Demographics: gender; age; living arrangement; and marital status were asked using standard questions from the New Zealand Census. Education was ascertained by any primary, secondary and/or tertiary education attendance. Self-rated standard of living was assessed by using part of the New Zealand Health, Work and Retirement study questionnaire. Questions to reflect the specific cultural issues for older Māori were included. Items were identified from focus groups led by a Kaitiaki (guardian) group of Māori elders. The methods have been described elsewhere and link with previous research with Māori of advanced age. Cultural items included the importance of *kai Māori* (traditional food), the importance of *taha wairua* (spirituality) and whether *te reo Māori* was the first language. Whether the participant lived in their own *hapū* (large extended family) area was recorded. Using a 5-step Likert scale (of not at all, to extremely important), the importance of *whānau*; *hapū*; language and *tikanga* (cultural practices); use of *Rongoā Māori* (Māori medicine and healing) was determined. Access to *kai Māori* and gardening habits were recorded.

**Nutrition risk assessment**

The 14-item validated questionnaire ‘Seniors in the Community: Risk Evaluation for Eating and Nutrition’, Version II (SCREENII) was used to determine nutrition risk. From an assessment of 21 tools which aim to assess the nutrition risk status of older adults, SCREENII was the only tool specifically designed for those living in the community. Based on comprehensive nutrition assessments, SCREENII has been validated among older people in Canada against the criterion of a dietitians clinical judgement of risk and has high inter-rater and test-retest reliability, as well as excellent sensitivity (94%) and specificity (78%) in detecting risk of malnutrition. SCREENII items are scored from 0 to 4, with high scores indicating low-risk, and scores less than or equal to two, out of a maximum of four, potentially leading to nutrition risk. The total scores range from 0 to 64. A cut-off of less than 50 is considered to be high nutrition risk.

**Health**

Depression was assessed by the 15-item Geriatric Depression Scale (GDS-15). The GDS-15 is a reliable and valid self-rating depression screening scale developed specifically for older people. Scores range from 1–15 and correlate with depressive symptoms. A higher score indicates more depressive symptoms.

Functional status was assessed with the Nottingham Extended Activities of Daily Living (NEADL), which is a measure of physical disability and independence. The NEADL asks whether the older person “does” a range of activities “on their own, on their own with difficulty, with help, or not at all”. There are 22 items of activities within, covering four domains: mobility; in the kitchen; domestic tasks; and leisure activities. A higher score is indicative of a higher level of function.

Physical assessments were conducted using portable equipment and included measures of height, weight, waist and hip circumference. Anthropometric measures followed the protocol advised by the National Nutrition Survey of New Zealand.

**Statistical analysis**

Descriptive analyses were completed for socio-demographic, cultural and physical
data and nutrition risk. The mean, standard deviation was calculated for the nutrition risk score.

Univariate analyses were completed to examine the relationship between the SCREEN II score, socio-demographic and cultural variables using ANOVA, t-tests and Chi Square, dependent on the form of the data. For the variable “special foods available when wanted”, the missing values (those who did not report having special foods) were coded to 0. A sensitivity analysis was completed restricting the analysis to only those who answered this question. Significant variables from the univariate analyses at the level of p<0.2 and relevant variables related to the literature were entered into a generalised linear regression model with SCREEN II score as the dependent variable. IBM® SPSS® Statistics 20 (SPSS) was used for all analyses. Statistical significance was set for p-value less than 0.05 in the regression model. The regression was completed with the whole sample (see Table 3), and a sensitivity analysis also completed restricted to those who answered the question about access to important foods.

**Results**

The participants comprised a total of 67 Māori, mean (SD) age 77 (1.5) years and there were 30 (44%) men. Forty-nine percent (n=33) of the participants lived in the Bay of Plenty region (14 men, 19 women) and 51% (n=34) lived in Northland (16 men, 18 women). All of the participants identified themselves as Māori, with 10 (14%) identifying themselves as Māori and ‘other’. Out of 65 participants who responded, 28 (43%) were married and two (3%) had never married. Thirty (46%) of the participants had been widowed and five (7%) had been separated or divorced.

Thirty-two (49%) of the participants had lost a spouse during their lifetime and 42 (64%) lived alone. Overall, eight (12%) of the participants had received only a primary education, 35 (53%) had received a secondary education and 20 (30%) had been tertiary educated. A total of 51 (91%) of the participants were able to speak te reo Māori and it was spoken by 35 (56%) as a first language (Table 2). Table 1 shows the SCREENII subscores.

The mean weight (SD) of the men was 90 (17) kg and for women was 77 (20) kg. The mean (SD) BMI was 31 (5) for men, 31 (9) for women. The mean (SD) body fat percentage was 20 (7%) for men, 38 (9%) for women. The mean waist-to-hip ratio (WHR) was 0.98 (0.1) for men, 0.89 (0.1) for women.

The overall mean SCREEN II score was 47.8 (5.3) (range 35–56, out of maximum 64). Nearly two-thirds (63%) of the participants were assessed as being at high nutrition risk (SCREEN II score <50). High nutrition risk was more common for women (60%) compared to men (40%).

Table 2 shows the univariate analyses. Those at high nutrition risk (lower SCREEN II score): were more likely to have lost a spouse; rated the importance of hapū and the importance of language and culture to wellbeing more highly; and were less able to access kai Māori. Those at high nutrition risk also had a lower WHR and had a higher GDS-15 score. These variables were entered into a generalised linear regression model. Importance of hapū and importance of language and culture were highly correlated (Spearman correlation coefficient 0.7). A decision was made to group these cultural variables together, and as they are positively reflective of Maori identity, were termed ‘cultural identity’ in the generalised linear regression model.

**Table 1:** SCREENII item scores that indicate nutrition risk

<table>
<thead>
<tr>
<th>SCREENII Item*</th>
<th>Participants with Scores ≤2b % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk Product Intake</td>
<td>Drinks milk or eats milk products &lt;1–2/day</td>
</tr>
<tr>
<td>Meat and Alternatives Intake</td>
<td>Eats meat or alternatives &lt;1/day</td>
</tr>
<tr>
<td>Fruit and Vegetable Intake</td>
<td>Eats &lt;3 serves/day</td>
</tr>
<tr>
<td>Unintentional weight change</td>
<td>Gain (28%) or loss (26%) of ±2kg in past 6 months</td>
</tr>
<tr>
<td>Skips meals</td>
<td>Skips meals sometimes/often/almost every day</td>
</tr>
</tbody>
</table>

*SCREEN II items are the questions from SCREENII.

bSCREEN II items with scores less than or equal to two, out of a maximum score of four, potentially lead to ‘nutrition risk’.
Table 2: Mean SCREENII score in relation to frequency counts (n) and percentage (%) for participant socio-demographic, cultural and physical characteristics.

<table>
<thead>
<tr>
<th></th>
<th>SCREEN II score Mean (SD)</th>
<th>Participants n (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>48.1 (5.23)</td>
<td>28 (44.4)</td>
<td>0.69</td>
</tr>
<tr>
<td>Women</td>
<td>47.6 (5.42)</td>
<td>35 (55.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Ever lost a spouse</strong></td>
<td></td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>No</td>
<td>50.7 (4.57)</td>
<td>23 (43.4)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>46.2 (4.81)</td>
<td>30 (56.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td>0.34</td>
</tr>
<tr>
<td>- Married / Partnered</td>
<td>49.1 (5.37)</td>
<td>28 (44.4)</td>
<td></td>
</tr>
<tr>
<td>- Widowed</td>
<td>47.0 (4.83)</td>
<td>28 (44.4)</td>
<td></td>
</tr>
<tr>
<td>- Divorced / Separated</td>
<td>45.4 (6.43)</td>
<td>5 (7.9)</td>
<td></td>
</tr>
<tr>
<td>- Never married</td>
<td>47.5 (9.19)</td>
<td>2 (3.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Living arrangement</strong></td>
<td></td>
<td></td>
<td>0.12</td>
</tr>
<tr>
<td>Alone</td>
<td>46.3 (5.53)</td>
<td>42 (67.7)</td>
<td></td>
</tr>
<tr>
<td>With others</td>
<td>48.5 (5.15)</td>
<td>20 (32.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td>0.15</td>
</tr>
<tr>
<td>- Primary</td>
<td>44.9 (3.72)</td>
<td>8 (13.1)</td>
<td></td>
</tr>
<tr>
<td>- Secondary</td>
<td>47.5 (5.04)</td>
<td>35 (57.4)</td>
<td></td>
</tr>
<tr>
<td>- Tertiary</td>
<td>49.2 (5.90)</td>
<td>18 (29.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Self-rated standard of living</strong></td>
<td></td>
<td></td>
<td>0.44</td>
</tr>
<tr>
<td>High / fairly high</td>
<td>48.0 (4.79)</td>
<td>23 (36.5)</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>47.9 (5.62)</td>
<td>39 (61.9)</td>
<td></td>
</tr>
<tr>
<td>Fairly low / low</td>
<td>41.0 (0.00)</td>
<td>1 (1.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Spirituality</strong></td>
<td></td>
<td></td>
<td>0.85</td>
</tr>
<tr>
<td>Not important</td>
<td>48.5 (6.7)</td>
<td>8 (12.7)</td>
<td></td>
</tr>
<tr>
<td>Somewhat / Moderately</td>
<td>48.4 (3.9)</td>
<td>9 (14.3)</td>
<td></td>
</tr>
<tr>
<td>Very / Extremely</td>
<td>47.6 (5.3)</td>
<td>46 (73.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Spirituality role in life</strong></td>
<td></td>
<td></td>
<td>0.40</td>
</tr>
<tr>
<td>No part</td>
<td>55.0 (0.0)</td>
<td>1 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Somewhat / Moderate</td>
<td>47.6 (6.2)</td>
<td>10 (15.9)</td>
<td></td>
</tr>
<tr>
<td>Very / Extreme</td>
<td>47.8 (5.1)</td>
<td>52 (82.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Conversational language/s Te Reo</strong></td>
<td></td>
<td></td>
<td>0.33</td>
</tr>
<tr>
<td>Speaks English Yes</td>
<td>47.8 (5.4)</td>
<td>57 (96.6)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>44.0 (0.0)</td>
<td>2 (3.4)</td>
<td></td>
</tr>
<tr>
<td>Speaks Māori Yes</td>
<td>47.4 (5.5)</td>
<td>51 (91.1)</td>
<td>0.18</td>
</tr>
<tr>
<td>No</td>
<td>50.8 (3.6)</td>
<td>5 (8.9)</td>
<td></td>
</tr>
<tr>
<td>Speaks Māori as the first language</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>46.9 (5.5)</td>
<td>35 (55.6)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>49.0 (5.0)</td>
<td>28 (44.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Importance of whānau to wellbeing</strong></td>
<td></td>
<td></td>
<td>0.29</td>
</tr>
<tr>
<td>Not at all</td>
<td>46.3 (5.3)</td>
<td>12 (19.4)</td>
<td></td>
</tr>
<tr>
<td>A little / moderate</td>
<td>0.0 (0.0)</td>
<td>0 (0.0)</td>
<td></td>
</tr>
<tr>
<td>Very / Extremely</td>
<td>48.1 (5.3)</td>
<td>50 (80.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Importance of hapū to wellbeing</strong></td>
<td></td>
<td></td>
<td>0.03</td>
</tr>
<tr>
<td>Not at all</td>
<td>46.9 (5.6)</td>
<td>13 (21.0)</td>
<td></td>
</tr>
<tr>
<td>A little / moderate</td>
<td>53.0 (3.2)</td>
<td>6 (9.7)</td>
<td></td>
</tr>
<tr>
<td>Very / Extremely</td>
<td>47.2 (5.1)</td>
<td>43 (69.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Importance of language and culture to wellbeing (cultural identity)</strong></td>
<td></td>
<td></td>
<td>0.02</td>
</tr>
<tr>
<td>Not at all</td>
<td>45.5 (4.9)</td>
<td>11 (17.7)</td>
<td></td>
</tr>
<tr>
<td>A little / moderate</td>
<td>53.2 (3.1)</td>
<td>5 (8.1)</td>
<td></td>
</tr>
<tr>
<td>Very / Extremely</td>
<td>47.7 (5.2)</td>
<td>46 (74.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Lives in own hapū area</strong></td>
<td></td>
<td></td>
<td>0.57</td>
</tr>
<tr>
<td>Yes</td>
<td>47.6 (4.9)</td>
<td>14 (22.2)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>48.6 (6.6)</td>
<td>49 (77.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Importance of using Rongoā Māori medicine</strong></td>
<td></td>
<td></td>
<td>0.84</td>
</tr>
<tr>
<td>Not at all</td>
<td>49.0 (4.4)</td>
<td>5 (18.5)</td>
<td></td>
</tr>
<tr>
<td>A little / Moderately</td>
<td>47.3 (4.3)</td>
<td>10 (37.0)</td>
<td></td>
</tr>
<tr>
<td>Very / Extremely</td>
<td>47.8 (6.1)</td>
<td>12 (44.4)</td>
<td></td>
</tr>
</tbody>
</table>
Kai Māori important

<table>
<thead>
<tr>
<th></th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>47.9 (5.4)</td>
</tr>
<tr>
<td>No</td>
<td>47.8 (5.4)</td>
</tr>
</tbody>
</table>

Kai Māori available when wanted

<table>
<thead>
<tr>
<th></th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>48.3 (5.1)</td>
</tr>
<tr>
<td>No</td>
<td>42.6 (3.2)</td>
</tr>
</tbody>
</table>

Manage your own garden

<table>
<thead>
<tr>
<th></th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>47.0 (7.6)</td>
</tr>
<tr>
<td>No</td>
<td>48.0 (5.0)</td>
</tr>
</tbody>
</table>

BMI kg/m², mean (SD)

<table>
<thead>
<tr>
<th></th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18.5</td>
<td>48.2 (5.21)</td>
</tr>
<tr>
<td>18.5 to 24.9</td>
<td>44 (0.00)</td>
</tr>
<tr>
<td>25.0 to 29.9</td>
<td>49.7 (5.54)</td>
</tr>
<tr>
<td>30.0 to 34.9</td>
<td>47.2 (5.22)</td>
</tr>
<tr>
<td>35.0 to 39.9</td>
<td>49.3 (4.60)</td>
</tr>
<tr>
<td>&gt; 40.0</td>
<td>52.3 (4.32)</td>
</tr>
</tbody>
</table>

Waist to Hip ratio

<table>
<thead>
<tr>
<th></th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low &lt;0.90 men, &lt;0.85 women</td>
<td>46.8 (4.71)</td>
</tr>
<tr>
<td>High ≥0.90 men, ≥0.85 women</td>
<td>48.4 (5.26)</td>
</tr>
</tbody>
</table>

Depressive symptoms, GDS-15

<table>
<thead>
<tr>
<th></th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>47.0 (7.43)</td>
</tr>
<tr>
<td>No</td>
<td>48.0 (4.84)</td>
</tr>
</tbody>
</table>

Table 3: Relationship between risk factors and SCREENII score examined using multivariable linear regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost a spouse</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>46.3</td>
</tr>
<tr>
<td>No</td>
<td>48.5</td>
</tr>
<tr>
<td>Importance of language and culture (identity)</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>46.9</td>
</tr>
<tr>
<td>A little to moderately important</td>
<td>53.0</td>
</tr>
<tr>
<td>Very to extremely important</td>
<td>47.2</td>
</tr>
<tr>
<td>Kai Māori important</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>48.67</td>
</tr>
<tr>
<td>No</td>
<td>46.25</td>
</tr>
<tr>
<td>Kai Māori available when wanted</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>49.19</td>
</tr>
<tr>
<td>No</td>
<td>45.73</td>
</tr>
<tr>
<td>†NEADL</td>
<td>-0.19</td>
</tr>
<tr>
<td>Waist to hip ratio</td>
<td>20.17</td>
</tr>
<tr>
<td>‡GDS</td>
<td>-0.60</td>
</tr>
</tbody>
</table>

BMI, body mass index; GDS, Geriatric Depression Scale; Data are reported for those completing all questions.

Controlled for age, gender, living arrangement
†NEADL, Nottingham Extended Activities of Daily Living
‡GDS, Geriatric Depression Scale
Table 3 shows the multiple regression results for the whole sample. Those who reported that kai Māori were important and had access to them regularly had lower nutrition risk controlling for all other variables. The rating of importance of cultural identity shows a nonlinear relationship, with those with responses in the moderate category having the lowest nutrition risk, but overall this factor was not independently associated with nutrition risk. The waist-to-hip ratio also independently related to nutrition risk, with a lower ratio being related to high risk. Although the scores for depressive symptoms were low, those with higher depression scores tended towards having higher nutrition risk.

The regression was repeated including only those that answered the question about availability of special foods. The significance of the availability variable increased to 0.02 and depression also reached statistical significance.

**Discussion**

This is the first study to report the prevalence of nutrition risk in Māori aged 75 to 79 years. Using SCREENII, two-thirds (67%) of the Māori participants were identified to be at high nutrition risk. SCREENII assessment among people aged 65 years or older in the Hawke's Bay area of New Zealand found Māori were five times more likely to be at high risk of malnutrition than non-Māori. The higher prevalence of nutrition risk among older Māori is supported by our findings.

The most frequent SCREENII items that contributed to nutrition risk were a low intake of milk products (75%), meat and protein alternatives (60%) and fruit and vegetables (59%), as well as unintentional weight change (54%) and skipping meals (52%). The intake of food items may have been under-reported. Process evaluation of the feasibility study indicated that several items of the screening tool were interpreted differently for Māori and non-Māori. Similar risk factor behaviours were observed among older Māori in the Hawke's Bay: a low fruit and vegetable intake (71%); a low milk product intake (68%); a low meat and protein alternative intake (68%); and skipping meals (61%). Unintentional weight change was reported by only 11% of Māori in the Hawke's Bay, although 68% perceived that their weight was more or less than it should be.

Current pricing of milk and milk products may be a barrier to intake. Participants may have had ample milk product intake in their earlier years when milk was a staple food at a subsidised cost. A low fruit and vegetable intake may also relate to cost. Vegetable intake may be systematically underreported for Māori because of the way they are prepared and counted. Vegetables are often combined for inclusion in a “boil-up” and reported as a single serving, although two or more vegetables may be consumed as part of one meal. Detailed nutritional assessment is needed to assess true intake. Over half of our Māori participants reported a low intake of meat or protein alternatives. The types and amounts of foods which contribute to protein intake need to be explored. The direction of unintentional weight change for the participants was similar for weight gain or loss. Risk of malnutrition is more commonly associated with weight loss and this needs further exploration.

We found that older Māori who report traditional foods are important and have access to these foods are at lower nutrition risk. Access to traditional foods is also important for Aboriginal and Torres Strait Islander people, where issues of land rights, conservation laws and access to hunting equipment have a potential impact. Similarly, access to traditional foods is recognised as important to the food security of indigenous peoples in Canada, and the dietary quality of food intake has shown to be improved on days when traditional foods are consumed. Having access to traditional foods may also improve the dietary quality of food intake for Māori. The process of procurement can also enhance whānaungatanga (kinship) and may improve food security.

Māori participants who rated language and culture as a little or moderately important, compared to not at all important, had a higher SCREENII score and were at lower nutrition risk. The level of te reo Māori fluency among the participants was high, with 56% using te reo Māori for everyday conversation. In comparison, on average 27% of Māori adults in New Zealand speak the language at least fairly well and 40% understand or read te reo.
Māori. The tikanga (cultural practices) that Māori live by underpin both health and well-being. Actions that facilitate cultural-based food practices may help to improve nutrition related outcomes. For older Māori eating may be facilitated by the whānaunga-tanga an older Māori person receives when others are present. More frequent contact with whānau, with marae (meeting place) and other Māori settings, may enhance nutritional intake, as well as strengthen cultural identity.

Depressive symptoms were associated with high nutrition risk, which supports the findings from other studies. The causes of depression are multifactorial. Self-identification as Māori whilst living with a supportive whānau community is seen to have positive influence, providing a sense of connection with others, with cultural heritage, and with the environment. These factors may also be of relevance to other indigenous groups of people.

Participants with a higher WHR were at lower nutrition risk. The implications of this finding for older Māori are unknown. Potentially, a relatively higher WHR may be protective, and this will be examined in the ongoing longitudinal study.

Generalisability of these findings is limited both by the small sample size and the inclusion of only two regions. There are few other reports of such data and novelty contributes to the strength of the study. SCREENII may not be accurate for Māori as it is developed in Canada and validation is needed for Māori and other indigenous groups of people. There may be a social bias in the reporting of the SCREENII food group items that may over or underestimate food consumed; problematic for any nutritional assessment.

This study needs to be repeated in a larger group and in other indigenous groups of people to ensure reliable conclusions.

Conclusion

This study indicated a high prevalence of nutrition risk in Māori aged 75 to 79 years. The importance of language and culture, being able to access traditional Māori foods, a higher WHR and the absence of depressive symptoms were associated with low nutrition risk. Unrestricted access to traditional kai for Māori should be self-determined. An increasing number of Māori are living longer and older Māori have an important role in whānau, hapū and iwi and in the wider community. Traditional foods meet healthy eating goals and also contain protective anti-oxidants, phytochemicals and anti-inflammatory agents. The traditional whānau or group approach applied to the growing, procurement, cooking and eating of food, and the concept of manaakitanga ensures that food is available for all. Māori knowledge has been built on a holistic, communal view of humanity through cultural processes and there is much that we can seek to know and learn from Māori to improve health and nutritional wellbeing. Education of the health workforce about the importance of kai may be needed and all practitioners should be aware of the nutrition risk associated with depression. Future research could examine the nutrition related health outcomes related to use of traditional kai. Interventions to improve the nutrition status of older Māori need to be based on a holistic Māori worldview. Actions which acknowledge and support the importance and access to traditional kai may assist older Māori better manage their health.
ARTICLE

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REFERENCES:

16. Ávila-Funes JA, Gray-Donald K, Payette H.
A comprehensive approach to improving patient flow in our hospitals—the ‘left to right, over and under’ concept

Michael Ardagh

ABSTRACT

It is essential we manage the capacity of our hospitals so that acute demand can be accommodated without developing queues for care and backlogs of work. This paper presents a comprehensive model for improving patient flow in our hospitals by attending carefully to both the demand and capacity states of the hospital and maximising efficient flow of our acute patient journeys. The model includes attention to the patient journey as the central focus, with an overarching governance structure and an underpinning sophisticated operations structure.

Recently, I completed nearly six years working with New Zealand District Health Boards, on behalf of the Ministry of Health, nominally to help them pursue the ‘Shorter Stays in the Emergency Department’ Health Target. While this target is about achieving a certain Emergency Department (ED) length of stay for a high proportion of ED patients, much of the work needed was facilitating patient flow through our hospitals. I was privileged to observe, frequently work with and occasionally help, the people of our hospitals as they did this work. Consequently I managed to accumulate knowledge of what worked, in what context, and what didn’t. This paper is a summary of some of this knowledge about acute patient flow in our hospitals. It attempts to construct an ideal model for improving patient flow and maximising the efficient use of the capacities of our hospitals. In reality, this ideal model doesn’t exist in any of our hospitals exactly in the form I propose, but the elements of it do. I am of the view that our hospitals, and our patients, would greatly benefit if these elements were brought together and made to work well.

Acute demand mitigation and alternatives to hospital care

It is important to emphasise efforts to decrease demand for acute hospital care and to provide alternative care options in the community. Our hospitals cannot continue to accommodate current rates of increase in acute demand and most would agree that care close to home is in the patients’, and the system’s, best interests. However, this paper is about flow of acute patients in the hospital. Acute demand mitigation and the provision of alternatives to hospital care are essential activities, but they are for discussion elsewhere.

The problem—our hospitals are struggling with demand

Demand for hospital care is increasing. Regularly, and particularly during winter, our hospitals become overcrowded and dysfunctional as demand exceeds capacity. Consequently, acute patients ‘overflow’ to less appropriate hospital wards—acute medical patients are admitted to surgical wards, filling these and resulting in cancelling elective surgery. Ward rounds are prolonged as clinical teams visit patients throughout the hospital (“safari
ward rounds”), decision making is delayed, patients access the next phase of care later, and hospital length of stay is prolonged. Prolonged length of stay further reduces access for new acute patients to hospital beds, making the demand and capacity mismatch worse. Exacerbating this are systems which might not facilitate early definitive decision making, timely access of acute patients to diagnostics, (eg, CT scanning), timely access to other necessary interventions such as acute surgery, nor efficient discharge of the patient when hospital care is no longer needed. Because acute patients continue to present to the ED, but access to care beyond the ED has become increasingly overwhelmed, a significant—although not the only—manifestation of this demand and capacity mismatch is worsening overcrowding in the ED (patients keep coming in but they can’t get out). ED overcrowding is associated with a number of well-documented adverse consequences, including greater discomfort and indignity for patients, worse clinical outcomes and increased mortality.2-7

Backlog and queues beget more backlog and queues—a downward spiral of hospital dysfunction

Patients wait in ‘queues’ for ED cubicles, doctors, CT scans, hospital beds, and so on. The formation of queues represents a ‘backlog’ of work—work parked in a queue, needing to be done in addition to the ongoing clinical demand of those continuing to come in. Now the ‘capacity’ (cubicles, doctors, CT scans, hospital beds and so on) is attempting to process the ongoing incoming demand (which it was struggling to deal with before, hence the development of the backlog), in addition to the accumulated backlog of work. Consequently, the backlog grows. Indeed, the growth in the backlog accelerates like the compounding interest of an investment in the bank, as the capacity can deal with a smaller and smaller proportion of the total work asked of it. Furthermore, the formation of queues exacerbates delays over and above the sum of all the work accumulated in the backlog. For example, if five patients wait for beds and five beds become immediately available, the 2nd, 3rd, 4th and 5th patients will have incremental additions to their waits as the patients ahead of them are processed (like a car stationary in a queue at the lights, even though the lights have turned green it does not get through the intersection because each car’s departure is incrementally delayed while waiting for the car in front to depart). The mismatch of demand and capacity creates a self perpetuating cycle of worsening mismatch with more overcrowding and a larger and larger ‘backlog’ of demand. Furthermore, the consequences of this are delays to treatment, longer hospital lengths of stay, increased adverse events, safari ward rounds, and so on—all of which further consume capacity and all of this combines to produce a downward spiral of overcrowding and hospital dysfunction. Consequently ‘a bad day’, sending the system down this spiral, might take several days of extra capacity (eg, special measures such as forcing discharges, cancelling planned admissions, opening extra beds, etc.) to reduce the overcrowding; a bad weekend might take a week or more and a prolonged influx of winter illness might take months to return to a state where the ‘backlog’ can be cleared and the overcrowding resolved.

It is a very bad thing

Meanwhile, the overcrowded and dysfunctional hospital has undoubtedly harmed patients, contributed to the deaths of some, and exacerbated the stress and frustration of its staff. Furthermore, the inefficiencies associated result in reduced productivity and a costly investment is required to accommodate both the inefficiencies and to get back on top of demand. Failure to match demand and capacity prospectively is bad for patients, staff, and it is very bad for the bottom line. Running hospitals like this is burning money.

There is a delusion that when there is an appropriate demand and capacity match things are ‘quiet’ and even ‘inefficient’

When things return to a state where demand and capacity are better matched, hospital staff—having battled with the demands of an overcrowded system—often perceive things are ‘quiet’ and as a consequence, somehow less productive. With no patients in corridors, with beds available
when patients are ready to go to them, with all the team’s patients on the one ward, when the day allows time for lunch and a cup of coffee, there is a misperception that the human and physical resources are not being optimally utilised. However, the opposite is true. As patients get the care they need more promptly, they have better outcomes and shorter hospital stays. Clinicians, sufficiently rested, fed and watered, and with less time pressures, attend to patients more quickly and more comprehensively, and make better decisions. Wasted time is removed from throughout the patient journey, there is less ‘re-work’ as things are done better the first time, and there is less demand created by the complications associated with rushed, truncated and delayed care. Having capacity which accommodates demand, flexes when there are predictable spikes in demand (eg, winter), and can recognise early and respond to unexpected spikes in demand, is good for patients, staff and the bottom line. For all of these reasons, not the least of which is the best use of our health dollars, we must keep above the spiral—keep the capacity above demand—more on this shortly.

**Capacity is not a bed count and demand is not a head count**

A patient is not a unit of demand. Each patient will have their own needs but similar patients might be grouped and counted to identify the accumulated demand on a given resource—resuscitation bay, CT scanning, operating theatre, duty neurologist, and so on. Capacity is not a hospital bed count. Capacity, in acute care, is many things—the capacity of the triage nurse to triage the growing queue of patients, the cubicle capacity of the ED, the decision making capacity among the medical staff (some of whom might offer limited decision making capacity and others—who often see the patient relatively late—might offer a lot), CT scanning capacity, nursing capacity on the ward, and so on. If a patient journey was value stream mapped, then deficiencies in capacity (bottlenecks in the journey) might be identified. The greatest deficiency in capacity is the tightest bottleneck—the most significant capacity constraint for that patient journey. Once the demand for that phase of care is exceeded then queues, backlogs, etc, manifest. However, once that ‘bottleneck’ is addressed, by better matching demand and capacity for that phase, then a new bottleneck will emerge as the greatest capacity constraint for that journey. Each new bottleneck will be a lesser constraint and as each is addressed the journey will become increasingly efficient.

**How much capacity?**

We are able to forecast demand, even acute demand, accurately. Use of predictive forecasting is well established in a number of our health systems. However, all of them should understand likely future demand, based on sophisticated prediction methodologies, and should be prepared for it. Based on predicted demand a desired capacity to address that demand can be considered. If capacity at any stage in a patient journey is sufficient to cater for the average demand, then it will be overwhelmed half the time, sending the system down the spiral of dysfunction. If capacity is set to cater for more than the highest forecast peaks of demand (greater than the 100th percentile of demand fluctuation) then the system should not go down the spiral, but more than half the time there will be unused capacity. We cannot afford this level of capacity. So, the average (50%) is too low, and 100% is insufficiently frugal. The correct capacity must be somewhere in between. There has been much discussion about 85% with this level of occupancy of hospital beds often cited as being most efficient for patient flow.\(^8,9\)

Of course, what this means is that a bed is available for a patient when the patient needs it, so that queues for beds don’t develop. But it is not the 85% occupancy that matters, it is the avoidance of queues. Starting a hospital day with 15% of beds free will not necessarily prevent queues if the 15% spare capacity is soon used up and not replenished. Similarly, starting a hospital day with no free beds might not result in queues for beds if the hospital has the ability to free up beds as soon as they are needed. Suffice it to say, the closer your capacity is to exactly matching your demand the more responsive your system needs to be so that capacity is rapidly mobilised to prevent queues developing. In reality, our hospitals cannot maintain more than 15% free capacity of beds, or other capacities, at all times. Consequently,
we must have responsive systems which know what is happening throughout the system, recognise when demand is threatening capacity and can mobilise capacity promptly so that we stay as close to the top of the spiral as we can. In essence, the key is to avoid queues, or at least to limit their length as best we can. The methodology below uses this as a foundation.

A comprehensive approach to improving patient flow in our hospitals—the ‘Left to right, over and under’ model

This model has three foundation principles:

1. The patient journey, as experienced by the patient, is the vantage point.
2. All staff in the system are citizens of a system and are working together to maximise the utility of the whole system and not just parts of it.
3. Avoiding queues, or at least limiting their size, is a priority.

And three conceptual components (Figure 1):

1. Governance
2. The patient journey
3. Operations

The conceptual components of the model are represented in Figure 1 and are explained in more detail below.

**Governance**

The ‘over’ part of the model is the overarching governance of what is done and how it is done. The components of Governance include:

1. **Structure**
   
   The structure is the gathering of people who both lead and manage the model. The membership is seen by staff as both representative (among the group are people who represent me) and authoritative (among the group are important people who can get things done). Already this structure has provided a clear statement for staff that they have a unified and well-led system, and that they are part of it.

   A significant fault in our hospitals is that a great many of our staff work in their circles with little understanding of, or commitment to, the whole system. This isn’t their fault. It is usually unclear to them how they fit into the scheme of things, nor what the scheme of things is. A structure such as this can provide that clarity. Furthermore, it is clear that doctors make important decisions about the elements of patient flow—when to admit, investigate, operate, discharge and so on—but they are seldom aware of the bigger hospital picture and very rarely contribute to bigger picture operations.

   To quote one senior nurse; “nurses run hospitals and doctors mess them up.” A structure such as this can engage doctors in the bigger operational picture.

   Included in this structure are good clinical governance, operational leadership, street wisdom and project management grunt.

   This group would work to principles such as those above, or augmented with their own, perhaps including principles relating to cooperation, respect, and quality. They would oversee the ‘operations’ component of the model and would (by virtue of their influence and authority) disseminate good practice and standardise practice, as appropriate, across the system.

   In the Patient Journey section to follow, a number of expected practices are alluded to and many are listed in Table 1. Examples...
include referral and handover practices from the ED to inpatient services, use of ‘journey boards’ and ‘daily rapid rounds’ and a number of others. Many of these have become a standard of care, but have been applied only patchily in our hospitals. Governance structures such as this can facilitate both the expectation and the implementation of these and other initiatives.

2. Method
The method employed by the Governance Group would include commonly employed project methodology such as those used in Lean Thinking. Of most importance is that the group is well informed with good data and good diagnostics. Ultimately, the methodology is to define actions for change and improvement, and should be comprehensive, prioritised, pragmatic and action orientated.

3. Plan
Out of the methodology will form a plan—the actions to be done. In our hospitals there are a great many things to be done. A mistake manifest in many of them is to embark on actions without applying a good methodology within an appropriate structure (the steps above). Not everything can be done at once. If good actions are taken, but they are not the most important actions just now, and particularly if they are not driven with clear outcomes, timelines and responsibilities, then they will often bear no fruit. The analogy of a dog chasing seagulls on the beach is apt. She sees a seagull and sets off after it. Out of the corner of her eye she sees another and sets off after that—then another, then another and so on. Although the dog is very busy, and exhausted at the end of the day, she catches no seagulls. Our process improvement efforts in many of our hospitals have been like a dog chasing seagulls. The ‘double whammy’ of this is that the expected improvement is not achieved but, in addition, those enthused to partake (particularly clinicians) become disillusioned and walk away from future improvement efforts.

The actions undertaken must be the priority actions, because they address the biggest bottlenecks in the patient journey, they are the most important from a quality or safety perspective, they offer the greatest improvement for the effort instilled, or some combination of these. The prioritisation comes out of the methodology above with the superimposition of the structure of the Governance Group. Furthermore, the Governance Group enables clear outcomes, timelines and responsibilities to be associated with each action and rigidly manages these so that the actions bring results.

Operations
The ‘under’ part of the model is Operations, which underpins good patient flow. One of the most important developments in our hospitals in recent years has been more sophisticated operations, sometimes based on precedents in other industries (eg, airlines) and often including an Operations Centre and operations meetings during the day. However, despite this improved sophistication there is much still to be done. Some of our hospitals still are run (particularly after hours) by senior nurses roaming the wards with a pencil and a clipboard. Even those with Operations Centres often are using them as little more than meeting rooms with electronic clipboards. Even when the information displayed and discussed demonstrates or predicts a hospital going down the spiral of dysfunction, often there is little able to be done in response. To leave the bed meeting on Friday after noting the hospital has a capacity and demand mismatch, is forming long queues and significant backlogs of work, with no further meetings until Monday, and with little more than a plan to ‘encourage early discharges’ is an indictment of how poorly we manage our hospitals.

Furthermore, despite the fact doctors often are responsible for key decisions which allow patient movement to the next part of their journey, it is very unusual to see one in an Operations Centre or at a daily bed/operations meeting. I doubt there are other industries which allow such crucial players to be so distant from operations.

The components of Operations might include:

1. **Forecasting demand in the future—days, weeks and months out.**
Predicting demand, days, weeks, months and even years in advance is important, so that predicted variations in demand (eg: Sundays in an
ED; the winter months in a medical ward; or a major event in a city), are matched by pre-emptive adjustments to capacity. Our health systems should understand likely future demand, based on sophisticated prediction methodologies, and should be prepared for it.

2. **Knowing demand now**
   Understanding demand right now is essential for the functioning of a responsive system which can shift capacity and demand effectively. Good, comprehensive, real-time data are needed to be able to respond to fluctuations in demand. It should be reiterated that demand is not a head count and capacity is not a bed count. A patient is not a unit of work and modern systems should be able to apply an appropriate ‘weighting’ to the capacity required to cater for a patient's needs, (the ‘weighting’ in this context is sometimes referred to as ‘acuity’). Many hospitals are doing this in some form, assisted by available tools (‘acuity tools’) and displaying this information to provide an overview of hospital demand and capacity ‘at a glance’. Operations Centres (or Control Centres) established in some hospitals provide the ‘command and control’ focus charged with scrutinising and responding to such information. Our hospitals should have authoritative control of capacity informed by comprehensive, real-time, understanding of demand.

3. **Matching capacity and demand**
   The two components above are about understanding capacity and demand in the future (forecasting), and now (daily operations). Responding to that understanding is essential. In general terms three categories of response might be considered:
   i. Medium to long term responses: eg, winter planning.
   ii. Short-term: daily operations
   iii. Crisis responses: also known as gridlock or overload plans. If the first two categories have been done well then crisis responses should become less and less necessary. As discussed earlier, the crisis is when the descent down the spiral of dysfunction has begun, with queues formed and backlogs of work accumulated. With this comes overcrowding, outliers, safari ward rounds, delayed care, longer length of stay, and so on. As much as we can, we should avoid getting into this state.

**How do we match capacity and demand?**

   Unless we are happy to reduce the quality of care delivered to patients then, in simple terms, the options to address capacity and demand mismatch are to:
   1. Reduce demand
   2. ‘Smooth’ demand and capacity curves so they are better matched—more later
   3. Free-up capacity by improving processes
   4. Purchase more capacity

   In reality, the answer is ‘all of the above’. While we must do all we can to reduce demand, it is ambitious to think we will be able to reverse it. Much work has been done to free-up capacity, but there is plenty of scope to do more. However, inevitably greater capacity will need to be purchased to cope with increasing demand. What we must not do is wallow unduly in options 1, 2 and 3 in the mistaken belief that we can avoid option 4 altogether. Options 1, 2 and 3 take time and, if we allow demand to exceed capacity regularly such that we descend down the spiral of dysfunction, it will ultimately be costly for patients, staff and the bottom line.

**Smoothing demand and capacity**

   Every day, demand for acute services follows a reasonably predictable curve, starting to climb out of its early morning nadir from about 10 or 11am until mid-afternoon, remaining high until late evening and then falling to its late night/early morning nadir again. However, the capacity curve lags behind. The freeing-up of inpatient beds—for example, as patients are discharged—tends to occur from mid-to late-afternoon. As the demand for beds begins to peak at 11am and the availability
is not for some hours later, there is a demand/capacity mismatch for these hours. Many observers are dismissive of this relatively brief mismatch and reassure that ‘beds will be coming up soon.’ However, during these hours queues develop and a backlog builds. Overcrowding ensues meaning queues for other parts of the journey (ED cubicles, nurses, etc) also develop, creating backlogs of work for these capacities too. While beds do ultimately become available, clearing the queue for beds, then clearing the queues that developed for other capacities and the accumulated backlog of work (while continuing to deal with the prolonged afternoon/evening peak in demand), takes a long time and great effort. Meanwhile care is delayed, length of stay in the ED is prolonged, and so on, further reducing the capacity to deal with ongoing demand and the accumulated backlog. Inefficiencies beget inefficiencies, and a relatively brief period of capacity and demand mismatch creates significant problems for a significant period of time. Ultimately, over the whole day, there is enough capacity and there isn’t too much demand, but the demand and capacity curves are mismatched. If this is happening at your hospital then shifting the capacity curve to earlier in the day is an important intervention.

Similarly, every week Monday brings significant demand for hospital beds (usually the highest number of acute admissions). However, the weekend days have seen the lowest numbers of discharges of the week. Consequently, we superimpose a high-demand day on a low-capacity day. Furthermore, some hospitals still bring elective admissions in on a Sunday and many have high elective day of admission rates on a Monday. These capacity/demand mismatches are self-inflicted. Consequently, queues and backlogs occur early in the week and the hospital remains over capacity well into the week. If these are occurring at your hospital, then increasing weekend discharges and smoothing elective in-flow so that it occurs when acute demand is least during the week, are important interventions.

Finally, it is not uncommon for hospitals to be doing large elective volumes in the winter and to do least in the summer. The reasons for this might include elective performance deadlines or to accommodate staff holiday patterns. Of course, acute demand is maximal in winter. Superimposing high elective demand on high acute demand, with a fixed hospital capacity, is inviting descent down the spiral. If this is happening at your hospital then changing seasonal patterns of elective activity to occur when acute activity is least is an important intervention.

Daily, weekly and seasonal demand and capacity mismatches are sometimes due to modifiable, self-imposed patterns of work. There is opportunity to smooth the demand and capacity curves so that mismatches are minimised.

The Patient Journey

Central to the model is the patient journey. Governing the sorts of things that happen on the patient journey, and the expectations of it, is the Governance Group. Operations ensure that these things happen as best they can. The patient journey, in this model, is central because it represents a foundation principle of the model, and because it is what governance and operations are all about.

There are a number of processes in the patient journey which the Governance Group should encourage and which Operations should facilitate. Figure 2 is a diagrammatic representation of the patient journey with each of the arrows representing a process which should be applied, as appropriate, to every acute patient journey through the hospital. Many of these are now considered a standard of care. To not apply them, therefore, is a failure to provide an acceptable standard of care. Listed in Table 1 is a selection of these processes.

In many of our hospitals, general/acute medical services have been innovative, applying many of these interventions to their patients. However, even this application is patchy with some wards doing it well and others not. For example, many wards have an ‘expected date of discharge’ displayed above the patients’ beds. Some fill it in and a few pay heed to it. However, outside of general medicine, use of these expected practises is uncommon. It behoves us to do these things and do them well to
## Table 1: A selection of expected elements of an acute patient journey

<table>
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<tr>
<th>Element</th>
<th>Description</th>
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| 1. Efficient referral processes for primary care to ED and acute specialities | • Easy and not obstructive.  
• Standardised as appropriate.  
• To consultant if possible.  
• With alternatives to immediate transfer (eg, acute clinics).  
• With alternative access to hospital if ED care not required (eg, direct to MAPU). |
| 2. Streaming from triage | • Triage nurse movement of patient to appropriate part of ED or other service. |
| 3. Nurse initiated treatments and referral | • For appropriate cases. |
| 4. Front loaded decision making in ED | • ED Consultant involved early to facilitate decision making. |
| 5. Explicit attention to patient flow in the ED | • Includes explicit responsibility for patient flow either in the form of a dedicated ED flow nurse or making this an explicit function of the senior nurse and doctor in charge of the shift (a non-clinical person facilitating flow is not the preferred model as it tends to prioritise time in ED as a driver for movement rather than clinical utility)  
• Measurement and display of metrics regarding flow (length of stay and occupancy, for example) to facilitate understanding of clinical progress of patients. |
| 6. Clinical agreements and clinical pathways | • Standardised care for appropriate patient groups.  
• Includes agreed specialist team for acceptance.  
• Includes agreed transfer to ward criteria (like the fractured neck of femur pathways, but applicable to many other patient groups).  
• Includes review by inpatient registrar in the ED only when required for patient benefit and not as a routine.  
• Includes encouragement of acceptance of referrals from ED based on negotiation, no refusal, and the concept of ‘best fit’ rather than definitive diagnosis.  
• Includes what and when imaging is done.  
• Includes agreements regarding ‘known’ patients and recent discharges. |
| 7. Maximised responsiveness of inpatient teams | • Medical representatives of inpatient teams (usually registrars) who are rostered to attend ED for acute care of patients under their speciality’s responsibility should be available or provide an alternative.  
• This means being free from other duties and having a backup plan (another registrar or consultant) when unable to attend promptly (for example, when doing acute surgery). |
| 8. Efficient nurse handovers to wards | • Standardised among all services, as appropriate.  
• Ideally electronic. |
| 9. Use of medical assessment and planning units (or similar) | • For the inpatient team workup of acute medical patients.  
• Includes transfer to the MAPU as soon as appropriate.  
• Surgical units (SAPUs) or similar units for other specialities, are not considered a standard of care but might be desirable. |
| 10. Use of expected date of discharge, journey boards and daily rapid rounds | • All patients admitted acutely (with few exceptions) should have an expected date of discharge displayed, communicated to the patient and family, and logged on a ‘patient journey board’ or similar.  
• From the day of admission patients’ discharge planning should begin, with opportunity for all members of the multidisciplinary team to see, understand and log their involvement with the patients on the journey board.  
• Daily rapid/board rounds including representatives of all disciplines involved in the patients’ care sharing a mutual update of the patients’ progress and revising their involvement with patients’ care accordingly. |
| 11. Prioritised discharge processes on day of discharge | • Medical and nursing prioritisation of patient discharge.  
• Includes ward rounds prioritising discharge patients (after those with urgent clinical needs).  
• Includes freeing junior medical staff early to complete any remaining paperwork.  
• Includes dedicating a nursing resource to discharging patients (various models). |
| 12. Community outreach/support/integration to facilitate discharge. | • Support in the home and community to facilitate discharge (various models). |
maximise the efficient use of the capacity we have.

**Summary**

It is essential we manage the capacity of our hospitals so that acute demand can be accommodated without developing queues for care and backlogs of work. This paper presents a comprehensive model for improving patient flow in our hospitals, by attending carefully to both the demand and capacity states of the hospital, and maximising efficient flow of our acute patient journeys. The model includes attention to the patient journey as the central focus, with an overarching governance structure and an underpinning sophisticated operations structure.

**Competing interests:**
The author has recently retired from the position of National Clinical Director of Emergency Department Services, with the Ministry Of Health, New Zealand. The author has recently resigned as a member of the Governance Group of the Safe Staffing Healthy Workplace Unit, Health Sector Unions and DHB Shared Services.

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**URL:**
REFERENCES:


9. Cooke MW, Wilson S, Halsall J, Roalfe A. Total time in English accident and emergency depart-

10. Ardagh M. How to achieve New Zealand’s shorter stay in emergency departments health target. New Zealand Medical Journal 2010 123 (1316)


Urate testing in gout: why, when and how
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ABSTRACT
Urate testing is essential for monitoring of gout treatment. Long-term urate lowering is required for effective management of gout. For all people with gout on urate-lowering therapy, the target concentration is less than 0.36mmol/L. This target is recommended by both the American College of Rheumatology and the European League Against Rheumatism, and is required to achieve urate crystal dissolution in vivo, prevent gout flares, and allow regression of tophi. The velocity of tophus regression is inversely related to the blood urate concentration, and for this reason, a lower target of less than 0.30mmol/L may be required for those with severe tophaceous disease. Monitoring of urate concentration is crucial to ensure that patients are achieving the relevant treatment target and to guide intensification of urate-lowering therapy to achieve the target. In this context, urate testing should be seen as much a part of the management of gout as HbA1c monitoring is for the management of diabetes.

While elevated blood urate (hyperuricaemia) is the central risk factor for development of gout, with increased risk of incident gout with increased serum urate concentrations, ‘screening’ people by measuring urate is not recommended. Most people with hyperuricaemia do not have gout. At present, drug treatment of isolated hyperuricaemia in the absence of clinical features of gout or urate nephrolithiasis is not recommended. Although some observational and laboratory data

Urate is a frequently measured blood test in people with gout and those at risk of gout. Although gout is potentially curable with long-term urate lowering therapy, confusion about the details of urate measurement has contributed to suboptimal care. In this article, we provide recommendations regarding urate testing in gout, focusing on the use of this test in clinical practice.

Urate (uric acid) is a frequently measured blood test in people with gout and those at risk of gout. Aotearoa New Zealand has a very high prevalence of gout, affecting 3.8% of those aged 20 years and over, and with an age-standardised prevalence of >10% in Māori and Pacific men. Therefore, understanding the role of this test is important. In this article, we provide recommendations regarding urate testing in gout, focusing on the use of this test in clinical practice.

Why test urate?
Urate is often tested when a diagnosis of gout is under consideration. Gout is a chronic disease of monosodium urate crystal deposition; these crystals form in presence of supersaturating concentrations of urate (above 0.41mmol/L at 37°C and physiological pH). For gout diagnosis, an elevated urate level in an individual with arthritis increases the likelihood of gout, but is not diagnostic. For accurate diagnosis, a complete clinical assessment is required and ideally, microscopic confirmation of urate crystals from a joint aspirate or tophus. The presence of a blood urate concentration consistently below 0.36mmol/L substantially reduces the likelihood of gout. In a recent large multinational study of people presenting with at least one swollen joint or subcutaneous nodule, only 7% of those with crystal-proven gout had urate levels consistently below 0.36mmol/L.

Urate testing is frequently measured in people with gout and those at risk of gout. Although gout is potentially curable with long-term urate lowering therapy, confusion about the details of urate measurement has contributed to suboptimal care. In this article, we provide recommendations regarding urate testing in gout, focusing on the use of this test in clinical practice.

ABSTRACT
Urate testing is essential for monitoring of gout treatment. Long-term urate lowering is required for effective management of gout. For all people with gout on urate-lowering therapy, the target concentration is less than 0.36mmol/L. This target is recommended by both the American College of Rheumatology and the European League Against Rheumatism, and is required to achieve urate crystal dissolution in vivo, prevent gout flares, and allow regression of tophi. The velocity of tophus regression is inversely related to the blood urate concentration, and for this reason, a lower target of less than 0.30mmol/L may be required for those with severe tophaceous disease. Monitoring of urate concentration is crucial to ensure that patients are achieving the relevant treatment target and to guide intensification of urate-lowering therapy to achieve the target. In this context, urate testing should be seen as much a part of the management of gout as HbA1c monitoring is for the management of diabetes.

While elevated blood urate (hyperuricaemia) is the central risk factor for development of gout, with increased risk of incident gout with increased serum urate concentrations, ‘screening’ people by measuring urate is not recommended. Most people with hyperuricaemia do not have gout. At present, drug treatment of isolated hyperuricaemia in the absence of clinical features of gout or urate nephrolithiasis is not recommended. Although some observational and laboratory data
have implicated urate in the pathogenesis of various conditions—including hypertension, metabolic syndrome and chronic kidney disease—there are insufficient clinical trial data to advocate treatment of these conditions with urate-lowering therapy at present. In those with established gout, diabetes and cardiovascular disease frequently coexist. For people with a family history of gout, discussion about ways to reduce risk factors for cardiovascular disease and diabetes is prudent, along with formal cardiovascular risk assessment for those in the relevant age and ethnic group. However, no specific interventions have been shown to prevent development of gout in people with elevated urate. Careful consideration must be given to urate testing in individuals who do not have suspected or confirmed gout, and routine urate screening of ‘high-risk’ groups without gout is not recommended.

When should urate be tested?

No clinically important diurnal variation exists for urate, and it can be measured non-fasting at any time of the day. Up to 40% of patients with an acute gout flare may have urate within the normal range at that time. Hence, if the urate is not elevated at the time of a flare of arthritis, and the diagnosis of gout remains a possibility, testing should be repeated after the flare has resolved to help establish the diagnosis of gout.

For individuals with confirmed gout, urate should be measured frequently (eg, monthly) during initiation and escalation of urate-lowering therapy. Once the target urate is achieved, it should be tested every 6–12 months to ensure ongoing maintenance of urate control.

How should urate be tested?

Urate should be measured using an accurate, reliable and precise method, as clinical decisions about gout management are made based on these test results. Most commonly, urate is tested on venous blood in an accredited chemical pathology laboratory, using an uricase assay, a method with high reliability and precision. The uricase assay is also available using the portable Reflotron™ system, with capillary blood test strips.

Various small point-of-care test meters using electrochemical methodology are commercially available for finger prick testing. Such mobile systems have the potential advantage of real-time urate monitoring, which would facilitate immediate adjustments in treatment depending on the test results. Point-of-care testing may also prevent the inevitable drop-out of patients attending a community laboratory for a venous sample. However, marked variation in the quality and performance of these meters has been reported. Collaboration with local laboratories is required to ensure appropriate training, record keeping, calibration and quality control prior to widespread community use of point-of-care test meters, as recommended by the New Zealand Best Practice Guidelines for Point-of-Care Testing. If quality is assessed as being adequate in a local situation, ongoing maintenance and assessment of calibration is necessary to ensure appropriate results are driving clinical decision making. A further key recommendation of the New Zealand Best Practice Guidelines for Point-of-Care Testing is that point-of-care testing should only be carried out by healthcare staff who have undergone appropriate training and competency certification and who have their competency levels regularly assessed. This is of particular relevance for point-of-care urate testing, as inadequate training may lead to false reassurance during an acute gout flare, or anxiety and fear about the long-term health risks of an elevated urate level in those without gout.

Patient understanding about treatment targets and urate testing

In order to ensure effective gout management, patient understanding about the rationale for urate testing, the role of urate-lowering therapy and the urate target is essential. We currently recommend the Ministry of Health patient resource that firmly focuses on urate lowering as the core...

Summary
Gout is a chronic condition with considerable impact on the lives of patients and their families. Although potentially curable with urate lowering therapy, confusion about the details of urate measurement has contributed to suboptimal care. The central strategy for effective gout management is long-term urate lowering therapy to maintain the urate below 0.36mmol/L. This approach requires regular urate testing and adjustment of urate lowering therapy to achieve and maintain this target. The gold standard is a venous sample at an accredited laboratory, and point-of-care urate testing requires training and calibration with an approved laboratory. We hope that these recommendations will clarify the role of urate testing in clinical practice, and ultimately lead to improved gout management in Aotearoa New Zealand.

Competing interests:
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REFERENCES:
What is this condition and how could it be treated?

Pamela Buchwald, Eve Keller, Christopher Wakeman

A 67-year-old, previously fit, woman presented with a history of rectal bleeding. Per rectum examination revealed a low rectal mass, which on endoscopy was demonstrated to be submucosal. MR rectum confirmed a 5 cm rectal mass displacing the rectum anteriorly. Chest x-ray and abdominal CT did not reveal any metastatic disease. Biopsies were consistent with high grade gastrointestinal stromal cell tumour (GIST). C-Kit was positive and Ki67 greater >20%. The patient came forward for an abdominoperineal rectal resection with permanent stoma and had an uncomplicated postoperative course.

GISTs are rare tumours that develop from interstitial cells of Cajal. Only 5% of GIST tumours arise in the rectum and GIST should be considered as differential diagnosis for submucous rectal lesions. Complete resection is recommended to achieve local disease control either by local resection or rectal resection depending on size. The benefit of imatinib as neoadjuvant treatment is uncertain.

**Figure 1a & b:** MR rectum showing a posteriorly located rectal GIST and the subsequent operation specimen.

**Competing interests:** Nil.

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A fungating tumour (measuring 7.9x8.5x7.5cm) on a 71-year-old patient’s right buttock (Figure 1).

Initial histopathological diagnosis was dermatofibrosarcoma protuberans (DFSP). Presenting as a small mass, it grew rapidly over 3 months. Repeat biopsy revealed high-grade spindle cell sarcoma. Clinically, the patient displayed ongoing systemic inflammatory response syndrome with coagulopathy and hyperdynamic circulation preventing surgical intervention. She had no pre-existing co-morbidities. Urgent palliative radiotherapy (Figure 2) achieved haemostasis at the bleeding tumour and subsequently the inflammatory response improved significantly.

Two weeks post radiotherapy, the patient underwent palliative surgical resection of this large mass. Unfortunately, restaging scans showed progressive pulmonary metastases. She continues to receive follow-up with oncologists for monitoring and consideration of systemic agents.

Dermatofibrosarcoma protuberans is a low-grade spindle cell neoplasm that constitutes 1% of all soft-tissue sarcomas, but it is the most common sarcoma of cutaneous origin with high cure rate. DFSP typically grows slowly over years with small rate of distant metastasis at 2–5%. Rarely, DFSP can transform into the more aggressive DFSP-fibrosarcomatous variant which is shown to have a higher local recurrence and metastatic potential.

The standard treatment is wide local excision with at least a 2 cm margin, however, when the tumour starts as a protruding mass, it has been shown to pose diagnostic and reconstructive challenges.

This case highlights that early referral to dermatologists and repeat biopsy of skin mass is crucial as we need to stay mindful of alternate diagnoses when the clinical picture is disparate with the natural history of the working diagnosis.

Figure 1: Fungating tumour on right buttock
CLINICAL CORRESPONDENCE

Figure 2: Tumour during course of palliative radiotherapy

Competing interests: Nil

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LETTER

Excise, electronic cigarettes and nicotine reduction to reduce smoking prevalence in New Zealand by 2025

Murray Laugesen, Randolph C. Grace

We investigate the possibility of achieving the Māori Affairs Select Committee's aspirational goal of only 5% of adults smoking by 2025, by increasing excise tax, making electronic cigarettes legal to sell, and reducing cigarette nicotine content. Our results show this is feasible.

Consumption and census data show similar rates of decline. Nicotine e-cigarettes (ECs) do not contain tobacco, cause few deaths, are not taxed, but currently cannot be purchased legally in New Zealand. Many ‘vape’ these devices without any proven extra harm. In 2014, a total of 1% of New Zealand adults used e-cigarettes daily. ECs, if approved for sale as a medicine, can be sold under the Medicines Act. Otherwise, ECs could only be sold if the Smoke-free Environments Act was revised. In 2015, tank e-cigarettes cost $3 per week, while the price of a packet of 20 cigarettes ($20) is rising each year due to excise.

From 2006–2009, tobacco consumption failed to fall below 2006 figures, as the translated smoking prevalence graph shows in Figure 1. From 2010 to 2014 the excise rose 10% per year and cigarette consumption per adult decreased by a mean 6.3% per year (for 2010–2013 and M. Laugesen, personal communication, 2015). The decreases in future prevalence after 2016 are estimated proportionally as 9.45%, 11.1% and 12.6% if excise rose annually by 15%, 17.5% or 20%. These new plots are depicted in Figure 1, numbering each plot from the top down.

Plot 1. Shows the legislated scenario for 2010–2016, during which time tobacco excise increased 10% per year. We would expect the percentage of smokers to decrease by a mean 6.3% per year through to 2016, and then decrease by 2.16% per year (based on the years 2003–2009, when real excise was not increased any more). In this scenario, 10.2% of adults would smoke in 2025.

Plot 2. Excise tax is extended at the current 10% increase per year from 2017 to 2025. If Parliament approved this, we would expect prevalence to decline by 6.3% per year. This would result in 6.9% of adults smoking in 2025, well above the goal of 5%.

Plot 3. Excise is increased to 15% commencing 1 January 2017. The percentage smoking each year declines by 9.45% and lowers adult smoking to 5.1% in 2025.

Plot 4. This shows the effect of increasing price by 17.5% annually from 2016, composed of 10% excise increase combined with a 7.5% effect from reducing nicotine content per year. This would mean reducing nicotine below New Zealand’s average nicotine content in 2011 (8.1 mg for factory-made and 10.9 mg for roll-your-own cigarettes)5 to the lowest possible level of 2 mg nicotine per cigarette (a non-addictive level). In our recent New Zealand trial, comparing ordinary full-priced cigarettes versus nicotine-free non-addictive cigarettes at no cost, consumption was halved.6 Increases in cost and decreases in nicotine content have been shown to have similar effects on consumption, suggesting that the key factor is the unit price of nicotine.7 By 2025 4.1% of adults still smoke.

Plot 5. If excise is raised 20% per year, smoking prevalence falls 12.6% annually and 3.7% smoke in 2025.
Plot 6. Excise is increased to 15% beginning 1 January 2017. In 2014 in the US, 5.7% of ex-smokers reported daily e-cigarette use, while 85% of vapers among ex-smokers had stopped smoking within the past five years, suggesting but not proving that ECs had helped them stop smoking.8 In the UK in 2014, 4.7% of ex-smokers reported regular e-cigarette use.9 On this basis we deducted an average (5.7+4.7)/2*85% =4.4% from New Zealand’s consumption from 2016 to 2025; 3.0% of adults would smoke in 2025.

Plot 7. With prevalence decreasing 12.6% per year as in Plot 5, and with ECs legal as in Plot 6, 2% would smoke in 2025.

Discussion

The bottom four scenarios in Figure 1 achieve the desired 5% or less smoking by 2025. Excise increases of 20% per year from 2017 to 2025 are required to reduce smoking rates to under 5%. Reduced increases will not achieve this goal. Excise, combined with legalised nicotine e-cigarettes or reduced nicotine cigarettes, will also reduce smoking below 5% in 2025. For groups with traditionally high smoking prevalence, further government action may be needed to make e-cigarettes low cost. Kozlowski,10 writing in the US where support has been strongest for reduced nicotine cigarettes, asks why wait—when the excise measures to reduce the harms of smoking can become available as soon as government decides. We estimate that as current rates of excise continue, cigarettes in 2025 will retail at over $40 per packet of 20s. Once the 2025 goal is attained legislation may be needed to phase out the import and sale of tobacco products altogether.

Figure 1: Estimated proportion of adults who smoke, by prevention group, 2006–2025.

Smoking prevalence is shown in 2006 and 2013 by Census, and for the years between it is estimated from tobacco products consumption per adult.4
LETTER

Competing interests:
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REFERENCES:
5. Laugesen M. Modelling a two-tier tobacco excise policy to reduce smoking by focussing on the addictive component (nicotine) more than the tobacco weight. NZ Med J 2012 14 Dec;125 (1367):35–48.
OBITUARY

Dr John Francis Arthur
(2 May 1930 – 7 March 2015)
MBBS University of London 1953, MD University of London 1967, FRCP 1973

John Arthur was born in Betchworth, Surrey, UK, educated at Sydney House School, Hastings and St Edward’s School, Oxford subsequently gaining his medical degree from the University of London in 1953. His pathology training was at the Royal Hampshire County Hospital Winchester and the Middlesex Hospital Medical School, London, where he became a Senior Lecturer in Pathology and Honorary Consultant Pathologist. John wrote a thesis on metaplastic polyps, one of the first to recognise and describe them. These are now known as serrated polyps, some of which carry a malignant potential. During this time he was Honorary Research Assistant at St Mark’s Hospital London, secretary to the World Health Organization (WHO) Consultant Group on the Histology of Breast Tumours and later director of the WHO International Centre for Histological Definition of Breast Tumour Types. He was a founding member of the College of Pathologists 1963. He was awarded the Windham Baring Prize in Pathology 1951 and the John George Mills Scholarship (Cancer Research) 1958–1960. He was a member, or affiliate member, of numerous pathology societies in Great Britain, Ireland, Australia and New Zealand.

In 1970 he was appointed jointly Associate Professor of Anatomic Pathology at the newly established School of Medicine, University of Auckland, and Histopathologist-in-Charge at Auckland Hospital. In these capacities, served on several medical school and hospital committees. In a busy career spanning nearly three decades, John, together with Professor Peter Herdson, built a pathology service that was respected and seen as a critical partner to clinicians in patient care. After retiring from the medical school he worked at Diag-
OBITUARY

nostic Medical Laboratory until the end of April 2007.


John was an outstanding teacher with the great gift of being able to present a complex topic simply. His autopsy sessions with clinicians were memorable in the days before the autopsy was largely superseded by advances in imaging technology. Clinicians in Auckland held him in high regard for his wide-ranging diagnostic ability, regularly referring difficult cases for his second opinion.

Pathology colleagues found John easy to work with and a good friend with a quiet sense of humour. In his relationships with junior colleagues, registrars and students, “Prof” as he was known, taught largely by example in professionalism, unfailing courtesy and dedication to pathology and to his colleagues—particularly those freshly qualified and facing unfamiliar responsibilities. When problems arose he was calm and logical in his approach.

John was a skilful sailor, and a proud and devoted family man. His adult children remember him reading stories at bedtime, or quoting poetry, a favourite being Edward Lear’s “The Owl and the Pussy Cat”. He was a superb yachtsman, and a member of the Institute of Navigation. With Heather, they took their four children sailing every summer. Woodworking skills were shared with his children. There were many good deeds without fanfare in his spare time, including building a ramp for a friend who needed easy access.

John was a modest and unassuming man who maintained strong principles of service to patients and to the medical community. He was a role model for generations of doctors and pathologists.

He is survived by his wife Heather, children Christopher, Elizabeth, Michael and Lucy, and grandchildren Catherine, Sarah, Emma and Veronica.

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Comprehensive geriatric care for patients with hip fractures

Most patients with hip fractures are characterised by older age (>70 years), frailty, and functional deterioration, and their long-term outcomes are poor with increased costs. This report concerns a randomised control trial which compares the effectiveness and cost-effectiveness of giving these patients comprehensive geriatric care in a dedicated geriatric ward versus the usual orthopaedic care.

397 home-dwelling patients with hip fractures, aged 70 years or older, were randomised in the emergency department—to either comprehensive geriatric care or orthopaedic care. The primary outcome was mobility at 4 months after surgery for the fracture. The comprehensive care cohort had a significant improvement in mobility at 4 months. The authors note that the trial was not powered enough to show differences in costs.

Lancet 2015; 385: 1623-33

Intensive diabetes therapy and ocular surgery in type 1 diabetes

Diabetes can cause vision loss by promoting sight-threatening conditions such as severe retinopathy, cataracts, and glaucoma. Although ocular surgery may preserve vision—or prevent loss of vision—in these patients, the question asked in this study is whether intensive therapy may reduce the need for such surgery.

The Diabetes Control and Complications Trial (DCCT) showed a beneficial effect of 6.5 years of intensive glycemic control on retinopathy in patients with type 1 diabetes. The DCCT now report an extended follow-up (median 23 years), comparing the need for ocular surgery in the intensive and conventional treatment groups. They report a substantial benefit in the intensive cohort. There was a 48% reduction in the risk of any diabetes-related ocular surgery in the intensive glycemic control group. The costs of surgery were 32% lower in this group.


Primary prevention with lipid-lowering drugs and long-term risk of vascular events in older people

Results from clinical trials show beneficial effects of lipid-lowering drugs in the primary or secondary prevention of coronary heart disease and stroke in people aged 50-70 years. This population-based cohort study reviews the association between use of lipid-lowering drugs (statin or fibrate) in older people with no known history of vascular events and long-term risk of coronary heart disease and stroke.

7,484 men and women (63%) with a mean age of 73.9 years and no history of vascular events were followed for a mean follow-up of 9.1 years. The findings were that use of statins or fibrates was associated with a 30% decrease in the incidence of stroke but had no effect on coronary heart disease.

BMJ 2015; 350:h2335

URL:
100 YEARS AGO

British Medical Association attacked

Suggestions for legislative restraint upon the operations of the British Medical Association were made by Mr. R. Fletcher in the House of Representatives recently. He gave notice to ask the Minister of Internal Affairs if he would amend the Medical Practitioners Act, 1914, in the interests of the welfare of the general public of New Zealand, as follows:

“(1) To insert a clause to the effect that any applicant for registration as a medical practitioner in New Zealand, if his application has been rejected by the Medical Board, shall be entitled to sit for any prescribed examination, and, on passing such examination, provided that he be of good moral character and repute, he shall be entitled to registration.” This provision, he explained, was made in previous Acts and there did not appear to be any reason for its deletion.

“(2) To insert a clause making it compulsory for any Medical Practitioner registered and practising in New Zealand to attend in consultation when, so required by any duly registered practitioner provided that a fee of not less than £1 1s. be tendered for such consultation, failing which that he be struck off the Medical Register and be not allowed to practise for a period of six months.” “It is an acknowledged fact amongst the medical faculty in New Zealand,” says Mr. Fletcher in a note, “that cases have occurred wherein it is positively detrimental for a medical man to assert his independence of the British Medical Association in different parts of the Dominion. The aforesaid Association, having locally formed itself into a ring or trust, and having practically insisted in an agreement with a numerous section of the public that the Association will only consult with those eligible for membership to it, is thereby a menace to the well being of public life, and the free practice of the medical profession.”

“(3) To include in an amending Act the widening of the University system by more fully assisting all Universities with medical schools for the youth of New Zealand who desire to follow a medical course and further to nationalise our medical system.”

NZMJ OCTOBER 1915

URL: