## CONTENTS

### This Issue in the Journal

4  A summary of the original articles featured in this issue

### Editorials

7  The Māori Affairs Select Committee Inquiry and the road to a smokefree Aotearoa
   *Tony Blakely, George Thomson, Nick Wilson, Richard Edwards, Heather Gifford*

19  The B4School Check—addressing the new morbidity in child health
   *Pat Tuohy*

22  Has the time come for a universal varicella (chicken pox) vaccination in New Zealand?
   *Tony Walls, Elizabeth Wilson*

### Original Articles

26  The role of sociocultural factors in obesity aetiology in Pacific adolescents and their parents: a mixed-methods study in Auckland, New Zealand
   *Tasileta Teevale, David R Thomas, Robert Scragg, Gavin Faeamani, Vili Nosa*

37  Body image and body change strategies among Tongan adolescents in Tonga and New Zealand
   *Marita P McCabe, Kalesita Fotu, Helen Mavoa, Gavin Faeamani*

47  Improving school readiness with the Before School Check: early experience in Hawke’s Bay
   *Russell Wills, Kay Morris Matthews, Cath Hedley, Trish Freer, Helen Morris*

59  Gestational diabetes mellitus in Tonga: insights from healthcare professionals and women who experienced gestational diabetes mellitus
   *Frances Doran, Kierrynn Davis*

68  Māori challenges and crown responsibilities: Māori policymaker ideas on smokefree policy options
   *Heather Gifford, Kiri Parata, George Thomson*
77 Association of parent and best friend smoking with stage of adolescent tobacco smoking
Robert Scragg, Marewa Glover, Janine Paynter, Grace Wong, Judith McCool

88 SIDS-related knowledge and infant care practices among Māori mothers
David Tipene-Leach, Lynne Hutchison, Angeline Tangiora, Charlotte Rea, Rebecca White, Alistair Stewart, Edwin Mitchell

Viewpoints

97 Preventing cardiovascular disease: a review of the effectiveness of identifying the people with familial hypercholesterolaemia in New Zealand
Lauretta A Muir, Peter M George, Andrew D Laurie, Nicola Reid, Lisa Whitehead

103 Moving forward with healthcare prioritisation
David Hadorn

Clinical Correspondence

112 Love bites—an unusual cause of blunt internal carotid artery injury
Teddy Y Wu, Jonathon Hsiao, Edward H Wong

116 A case of oesophageal varices and portal hypertension in an HIV-positive patient with no evidence of cirrhosis
Sara Temelkovski, James Irwin, Jim Brooker

121 Medical image. A medical emergency following chicken pox
Tilak de Almeida, Charaka Goonasekera, Jon Skinner, Fraser Maxwell

124 Medical image. Aortic aneurysm in a girl with Takayasu’s arteritis
Selim Doganay, Ercan Kocakoc, Yasar Sen

100 Years Ago in the NZMJ

126 The prevention of sepsis in compound fractures

Methuselah

127 Selected excerpts from Methuselah

Letters

129 Poorer mental health in many New Zealand smokers: national survey data from the ITC Project
Nick Wilson, Deepa Weerasekera, Sunny Collings, Richard Edwards, Frederieke S van der Deen
A response to the article "Task Manager: an innovative approach to improving hospital communication after hours"  
Yvonne Williams, John Morton, Roxanne McKerras

Obituaries

134  Wilfrid Christie Mills
137  William Henley Bird

Notice

139  Heart Foundation: Grants Awarded November 2010

Errata

141  E Overton. Answer to NZMJ about Ron Jones’ research
   NZMJ
142  Thornley S, McRobbie H, Jackson G. The New Zealand sugar (fructose) fountain: time to turn the tide?
   NZMJ

Book Review

143  Decision Making in Medicine: An Algorithmic Approach (3rd edition; SB Mushlin, HL Greene, eds)
    David Cole
This Issue in the Journal

The role of sociocultural factors in obesity aetiology in Pacific adolescents and their parents: a mixed-methods study in Auckland, New Zealand
Tasileta Teevale, David R Thomas, Robert Scragg, Gavin Faamani, Vili Nosa

Structural not cultural reasons influence obesity for Pacific adolescents and their families in Auckland New Zealand. This study investigated the factors influencing food and physical activity habits of Pacific adolescents and their families and compared the responses of obese and non-obese (healthy weight) adolescents and their parents. The study found cost of food, lack of parental time to prepare healthy foods or monitor eating practices due to being absent from working in shift-type employment, was the main difference between obese and non-obese (healthy weight) adolescents. Both sets of students (obese and healthy weight) and their parents were knowledgeable about healthy foods and eating practices and valued highly the health benefits of physical activity. These cultural factors were less influential on food and physical activity choices and did not protect against obesity-risk for Pacific adolescents. The study recommends structural changes to the food environment, such as the removal of GST on healthy food items, re-instating the Healthy School Food policy and more public investment in school-based physical activity to address Pacific adolescent obesity in New Zealand.

Body image and body change strategies among Tongan adolescents in Tonga and New Zealand
Marita P McCabe, Kalesita Fotu, Helen Mavoa, Gavin Faamani

The aim of this study was to evaluate the body image and body change strategies of adolescents from Tonga, and Tongans who are resident New Zealand. In total, 598 Tongans from Tonga and 388 Tongans from New Zealand completed measures of body image, body change strategies and messages about their body. Tongans in Tonga were more likely to receive positive messages about a larger body from adults at school, church and the media, and losing weight from the media. They were also more likely to adopt strategies to lose weight, increase weight and increase muscles. The large body ideal appears to be still valued in Tonga, whereas Tongans also want to lose weight because of media messages to achieve a healthy body weight.
Improving school readiness with the Before School Check: early experience in Hawke’s Bay
Russell Wills, Kay Morris Matthews, Cath Hedley, Trish Freer, Helen Morris

The Before School Check is delivered by nurses in the community to 4-year-old children. It includes assessment of vision, hearing, growth, general health, development and behaviour. In Hawke’s Bay the programme was implemented as a partnership between the Hawke’s Bay District Health Board Public Health Unit, Child and Adolescent Mental Health Service and Department of Paediatrics; Hawke’s Bay Primary Health Organisation; Ministry of Education Special Education; and community social service organisations. This collaboration meant that referral pathways for children identified with problems worked well and children referred with problems were seen promptly.

Gestational diabetes mellitus in Tonga: insights from healthcare professionals and women who experienced gestational diabetes mellitus
Frances Doran, Kierrynn Davis

Diabetes is epidemic in Tonga. Obesity and lack of physical inactivity (risk factors for diabetes) are common in Tonga and women who experience gestational diabetes during their pregnancy have an added risk of developing diabetes. Even though the rates of gestational diabetes in Tonga are very high there has been little research on the topic. A qualitative study was undertaken to explore gestational diabetes in Tonga with women who experienced gestational diabetes and health professionals who worked in the diabetes area. It was found that during pregnancy women were encouraged to make lifestyle changes to help manage their gestational diabetes but this needs to continue after pregnancy to prevent diabetes. The research also highlighted the need to shift attitudes towards preventive screening for diabetes in Tonga as well as adequate funding of screening supplies.

Māori challenges and crown responsibilities: Māori policymaker ideas on smokefree policy options
Heather Gifford, Kiri Parata, George Thomson

Research by Whakauae Research and the University of Otago, looking at what Māori policymakers’ saw as important for smokefree tamariki, found that Maori politicians and officials were keen on a more Māori-focused and driven approach to tobacco control policy; saw children as drivers of smokefree changes and children’s rights to a smokefree environment one of the catalysts for change; and thought strong national and local indigenous leadership was needed for smokefree environments change. However they also saw an important role for central and local government in driving legislation and regulation; discussed the need to refresh the smokefree message and deliver this in a more holistic way focusing on health, family and children
Association of parent and best friend smoking with stage of adolescent tobacco smoking
Robert Scragg, Marewa Glover, Janine Paynter, Grace Wong, Judith McCool

We found in a large survey of Year 10 (4th form) students during 2002–2006 that smoking by best friend and parents, collectively, explain a high proportion of current Year 10 students who smoke tobacco daily (79%). In contrast, neither parental nor peer-smoking were related to smoking susceptibility among adolescent non-smokers, which suggests other factors, such as risk taking, family conflict or low self-esteem, may be involved in the progression to smoking once children reach adolescence. Given evidence showing the limited success of school-based interventions against the effects of peer-smoking, our findings support efforts to prevent youth tobacco smoking by targeting parents who smoke, particularly before their children reach the teenage years. This may have a double benefit of reducing both adult and adolescent smoking.

SIDS-related knowledge and infant care practices among Māori mothers
David Tipene-Leach, Lynne Hutchison, Angeline Tangiora, Charlotte Rea, Rebecca White, Alistair Stewart, Edwin Mitchell

Whilst it is known that Maori have high SIDS rates and that SIDS is related to cigarette smoking in pregnancy, to prone sleeping of the infant and to co-sleeping where there was cigarette smoking in pregnancy, there has not been any quantification of this in recent times. This paper does that. In addition, it is not known whether Maori mothers hear the messages around the prevention of SIDS and if they do, whether they follow them. The paper comments on information known, quantifies the above risky behaviours and discusses present SIDS prevention activities.
The Māori Affairs Select Committee Inquiry and the road to a smokefree Aotearoa

Tony Blakely, George Thomson, Nick Wilson, Richard Edwards, Heather Gifford

The Māori Affairs Select Committee (MASC) Inquiry in New Zealand on tobacco has released a report that is “bold and visionary” on many grounds. Firstly, it sets an ambitious but achievable goal of making New Zealand smokefree by 2025, with a clear interim target of halving tobacco consumption and smoking prevalence among all groups by 2015. The smokefree goal is, to our knowledge, the first such proposal in the world by an official body (e.g. the Finnish Government goal is not tied to a date).

Secondly, the Report recommends a comprehensive and cutting-edge programme of measures to achieve this goal—some of which would be new for New Zealand (e.g. removing point of sale displays), some new for anywhere in the world (e.g., direct intervention to reduce retail supply of tobacco products) and others which intensify existing interventions (e.g. additional tobacco tax increases). It further recommends that an updated tobacco control strategy be developed, and addresses the issue of the structure of tobacco control management.

Thirdly, it clearly targets the vector of the tobacco epidemic, the tobacco industry rather than the smoker, and suggests that tobacco control innovations “should place financial, ethical and legal pressure primarily on the tobacco industry”.

Fourthly, the MASC Report challenges the current strategy which focuses mainly on smoking cessation support, and makes it clear that broad policy interventions are necessary. One of the most innovative features is an additional focus on reducing the supply of tobacco, e.g. consideration of annually reducing tobacco imports and the number of retail outlets. The recommendation of empowering local councils to limit the numbers and location of retailers is an important and innovative aspect of the Report, which fits well with the strong community drives to limit alcohol and gambling outlets in New Zealand.

Finally, the Report places primacy on those who are disproportionately affected by the tobacco epidemic, Māori smokers and their whānau (extended family). It recommends Māori participation and leadership, kaupapa Māori approaches and a focus on interventions to reduce smoking among Māori. Implementation of the approach recommended by the Select Committee would contribute substantially to improving Māori health and reducing health inequalities.

It is critical to note that the MASC is not running against public opinion. Rather, it is legitimised by strong and increasing public support (including among smokers) for stronger actions on tobacco. For example, new data indicates that those agreeing with the statement ‘the number of places allowed to sell cigarettes and tobacco should be reduced to make them less easily available’ remained high at 65% and 67% during 2008–2010.
Likewise, those agreeing with the statement ‘tobacco companies should not be allowed to promote cigarettes and tobacco by having different brand names and packaging’ increased from 54% to 60. Thus, the New Zealand public (including smokers) support the direction of this bold policy prescription, legitimising government and societal action to achieve the smokefree goal.

The full list of the MASC Report’s 43 recommendations, and two commendations, are listed in Table 1. This is a comprehensive list, covering most important domains of tobacco eradication.

The remainder of this Editorial is grouped in three Parts:

- **Part 1** is an analysis of the MASC’s recommendations, with a particular view to what should happen next and in what priority order.
- **Part 2** examines what else might be needed to ensure a Smokefree New Zealand is achieved by 2025.
- **Part 3** is a summary and our view of what we need to do now.

**Part 1: Analysis of the MASC recommendations**

The MASC’s recommendations can be grouped into four categories:

- **Done or in progress**—The already in-train tobacco tax rises and the ban on smoking in prisons are the most obvious examples. The planned legislation announced by Minister Turia the day after the Report’s release addresses six more of the recommendations (Table 1).

- **Do now**—Many other recommendations in the MASC Report could be implemented now, without great cost, and without limiting options on the harder decision making needed for finalising the comprehensive strategy. We identified 14 such ‘Do now’ options, ranging from getting rid of vending machines to ensuring the age of the person selling tobacco is 18 years plus.

- **Develop policy options in 2011**—Some recommendations require careful policy analysis and decision-making. For example, the MASC was very careful in pointing to the need for more deliberative decision making about: using declining import quotas, regulating tobacco constituents (e.g. changing the palatability and/or nicotine content of tobacco products), the role of alternative nicotine delivery systems, and (most importantly in the medium term) what the exact shape of a new strategy should be to get to a halving of prevalence and consumption by 2015.

The MASC, understandably, was not able to do this detailed strategy development work, but it urgently needs doing by mid 2011 at the latest. Options for this responsibility include the Ministry of Health, or a Taskforce that reports back to Parliament. Information for decision-making is of course imperfect, but there is sufficient information to formulate a strategy that will guarantee achievement of firstly the 2015 goal, then with revision a high probability of achieving the ultimate goal by 2025.
Table 1. Summarised list of MASC recommendations to Government, and our categorisation and comments
(A = “In progress”; B = We suggest “Do now”; C = We suggest “Develop policy in 2011”; D = We suggest “Develop a marketing plan in 2011”)

<table>
<thead>
<tr>
<th>Grouping</th>
<th>Recommendation</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>1. Halve smoking by 2015, smokefree by 2025</td>
<td>B. Do now - Accept and embed the goal in legislation.</td>
</tr>
<tr>
<td>Tobacco Industry</td>
<td>2. Tobacco Industry (TI) finance all smoking cessation pharmaceuticals</td>
<td>C. Develop policy options in 2011. [We have some doubts about focusing only on pharmaceuticals (e.g., unnecessary added complexity; privileging of only pharmaceutical interventions for direct TI funding).]</td>
</tr>
<tr>
<td></td>
<td>3. Article 5.3 FCTC in NZ legislation and policy making</td>
<td>B. Do now – Embed into NZ legislation</td>
</tr>
<tr>
<td></td>
<td>4. Government-run counter marketing campaign</td>
<td>D. Develop overall social marketing plan</td>
</tr>
<tr>
<td>Reduce availability/supply</td>
<td>5. Investigate measures to reduce supply, including trade implications</td>
<td>C. Develop policy options in 2011 [A key area for NZ research.]</td>
</tr>
<tr>
<td></td>
<td>6. Consider annual quota reduction in tobacco imports</td>
<td></td>
</tr>
<tr>
<td>Plain packaging</td>
<td>7. Plain packaging to harmonise with Australia</td>
<td>A. In progress [monitor Australian progress]*</td>
</tr>
<tr>
<td>Additives</td>
<td>8. Compulsory reporting of additives by brand</td>
<td>B. Do now by amending present legislation.</td>
</tr>
<tr>
<td>Covert sponsorship</td>
<td>10. Amend SFEA to prohibit (e.g., exclusive supplier deals)</td>
<td>B. Do now by amending present legislation</td>
</tr>
<tr>
<td>Retailers – Ban displays</td>
<td>11. Ban all retail displays</td>
<td>A. In progress *</td>
</tr>
<tr>
<td>Retailers</td>
<td>12. Remove from SFCA ability for tobacco companies to engage in “normal trade discount or normal trade rebate”</td>
<td>A. In progress *</td>
</tr>
<tr>
<td></td>
<td>13. Penalty for selling to minors to increase to $10,000</td>
<td>A. In progress *</td>
</tr>
<tr>
<td></td>
<td>14. Person selling tobacco must be 18+ years</td>
<td>B. Do now by amending present legislation</td>
</tr>
<tr>
<td></td>
<td>15. Instant infringement notices, instant fines and retail bans on retailers violating SFCA</td>
<td>A. In progress *</td>
</tr>
<tr>
<td></td>
<td>16. Investigate giving local councils options to control number and</td>
<td>C. Develop policy options in 2011. (This could include</td>
</tr>
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<tr>
<td>Grouping</td>
<td>Recommendation</td>
<td>Comment</td>
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<tr>
<td>Location of retail outlets</td>
<td>removing tobacco sales from pubs and other licensed premises, as in Quebec.40)</td>
<td></td>
</tr>
<tr>
<td>17. Ban the use of word “Tobacco” in retail outlet names</td>
<td>A. In progress *</td>
<td></td>
</tr>
<tr>
<td>18. Ban cigarette vending machines</td>
<td>B. Do now by amending present legislation</td>
<td></td>
</tr>
<tr>
<td>Smokefree campaigns – children</td>
<td>19. Ensure smokefree campaigns are reaching right demographic</td>
<td>D. Developing overall social marketing plan</td>
</tr>
<tr>
<td></td>
<td>20. Campaigns to reinforce unacceptability and illegality of supplying minors</td>
<td>B. Do now.</td>
</tr>
<tr>
<td>Smokefree campaigns – Māori and pregnant women</td>
<td>21. Continue campaigns marketed towards high-risk groups</td>
<td>D. Developing overall social marketing plan</td>
</tr>
<tr>
<td>Smokefree campaigns – social media</td>
<td>22. Campaigns using newer forms of media, e.g. social media</td>
<td>D. Developing overall social marketing plan</td>
</tr>
<tr>
<td>Smokefree environments</td>
<td>23. Commend banning smoking in prisons</td>
<td>A. In progress (to happen in 2011)</td>
</tr>
<tr>
<td></td>
<td>24. Further increase support, including financial, to iwi and communities to promote smokefree events</td>
<td>D. Part of developing overall social marketing plan</td>
</tr>
<tr>
<td></td>
<td>25. Investigate extending SFEA to legislate against smoking in certain include vehicles (especially carrying children) and specific public places.</td>
<td>C. Develop policy options in 2011 for introduction in 2012 at the latest.</td>
</tr>
<tr>
<td>Support – Māori and whanau</td>
<td>26. Extend the range and reach of services for priority populations, especially Māori</td>
<td>C. Develop policy options in 2011</td>
</tr>
<tr>
<td></td>
<td>27. Progress the “Wai844 claim” that asks for “funding for Māori Health services to eliminate or reduce smoking among Māori”</td>
<td>Parallel activity. May impact on “C. Develop policy options in 2011”</td>
</tr>
<tr>
<td>Support</td>
<td>28. Nicotine therapy required to be sold wherever tobacco is sold.</td>
<td>B. Do now by amending present legislation.</td>
</tr>
<tr>
<td></td>
<td>29. Pharmacists to become quit card providers</td>
<td>B. Do now by amending present legislation.</td>
</tr>
<tr>
<td></td>
<td>30. Pharmac strongly encouraged to subsidise a wider range of treatments</td>
<td>(Do not support. Pharmac has robust assessment processes. The health sector’s job is to maximise the use of therapies deemed cost-effective, and emphasise equity and other criteria in future submissions.)</td>
</tr>
<tr>
<td></td>
<td>31. Further research into benefits and risks of alternative nicotine</td>
<td>C. Develop policy options in 2011. [A key area for NZ</td>
</tr>
<tr>
<td>Grouping</td>
<td>Recommendation</td>
<td>Comment</td>
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<tr>
<td>----------------------------------------------</td>
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<tr>
<td></td>
<td>delivery systems (e.g., snus, inhalers)</td>
<td>research.</td>
</tr>
<tr>
<td>32.</td>
<td>Initiate proactive cessation programme in prisons.</td>
<td>Do now.</td>
</tr>
<tr>
<td>Tobacco tax increases</td>
<td>33. Commend 10% (done), 10% (1 Jan 2011), 10% (1 Jan 2012) tax rises, and equalisation of loose (roll-your-own) tobacco and manufactured cigarettes.</td>
<td>Done, in progress (albeit with some scope for further equalisation based on typical RYO sizes)</td>
</tr>
<tr>
<td></td>
<td>34. Further tax increases over and above rate of inflation</td>
<td>C. Develop policy options in 2011 (as will intersect with recommendations 5 and 6 above)</td>
</tr>
<tr>
<td>Update tobacco control strategy and structure</td>
<td>35. Establish new tobacco control strategy, with strong emphasis on Māori, and how to achieve halving by 2015. Then revise for 2025 goal.</td>
<td>C. Develop in 2011. <strong>ABSOLUTELY CRITICAL.</strong> Will be where decisions on items C ‘Develop policy options in 2011’ and D ‘Develop overall social marketing plan’ are brought together.</td>
</tr>
<tr>
<td></td>
<td>36. Investigate options for optimal tobacco control governance and structure, including a possible (time limited) Tobacco Control Authority.</td>
<td>C. Develop policy options in 2011, and decide as part of above Recommendation 35. <strong>ABSOLUTELY CRITICAL.</strong></td>
</tr>
<tr>
<td></td>
<td>37. Consider a funding formula that provides equitable funding for all Māori programmes and services.</td>
<td>C. Develop policy options in 2011</td>
</tr>
<tr>
<td></td>
<td>38. Ongoing, independent research and evaluation for all Māori</td>
<td></td>
</tr>
<tr>
<td>Kaupapa Māori</td>
<td>39. Include Māori in all tobacco control planning and policy development.</td>
<td>B. Do now.</td>
</tr>
<tr>
<td></td>
<td>40. Develop a Kaupapa tupeka kore approach as viable Māori framework</td>
<td>C. Develop policy options in 2011, alongside recommendation 35 (Strategy).</td>
</tr>
<tr>
<td></td>
<td>41. Further increase support, including financial support, to iwi and communities for smokefree activities and events, and to extend smokefree environments</td>
<td>B. Do now, and C. Develop policy options in 2011.</td>
</tr>
<tr>
<td>Illicit trade</td>
<td>42. Increase monitoring of the illicit trade</td>
<td>C. Develop policy options in 2011.</td>
</tr>
<tr>
<td></td>
<td>43. Develop comprehensive systems for detecting smuggling in alignment with Article 15 of WHO FCTC, and with Asia-Pacific Region</td>
<td>C. Develop policy options in 2011.</td>
</tr>
<tr>
<td>Home-grown tobacco</td>
<td>44. Decrease personal allowance to approximate one person’s average consumption.</td>
<td>Do now by amending present legislation.</td>
</tr>
<tr>
<td>Duty-free tobacco</td>
<td>45. Investigate other jurisdictions with a view to changing amounts [of tobacco] permitted into New Zealand.</td>
<td>B. Do now.</td>
</tr>
</tbody>
</table>
* These measures were included in draft legislation tabled by the Hon Tariana Turia (Associate Minister of Health) the day after the MASC Report release. (www.beehive.govt.nz/release/tobacco+controls+tightened; accessed November 8, 2010.); SFEA – Smoke-free Environments Act.
The strategy development work needs to be co-ordinated with other work and sectors. The Ministry of Health has just approved funding (November 2010) for the development of a Māori Tobacco Control Strategy; strong partnerships will be essential to ensure that the emphasis expected by MASC of Māori-focused outcomes within a national strategy is achieved.

One of the most promising recommendations in the Report is that additives and nicotine levels in tobacco products should be regulated. Reducing nicotine levels as an overarching strategy is an avenue for which there is some evidence.15–20 The mandatory removal of all sweeteners and other additives could ensure tobacco products are less addictive or palatable, and thus reduce demand and initiation.21–23 These approaches require much greater attention to progress beyond aspirations to concrete policy development and implementation—with ongoing evaluation.

We believe they could have a key role alongside price increases, and a tobacco import reduction policy.24 Clarifying how these mechanisms should be used in New Zealand in the next 5–15 year is a crucial output of the policy analysis and decision making work during 2011.

Develop an overall social marketing plan—The MASC commend past campaigns, and recommends strengthening some of these (e.g. increasing support, including financial, to iwi and communities to promote smokefree events). It recommends the introduction of new mainstream campaigns (e.g. on tobacco and tobacco industry ‘denormalisation’ similar to that promoted by Te Reo Marama) and new approaches (e.g. Internet and social network websites). One recommended marketing strategy is, in our view, so urgent that it should happen now, i.e. campaigns to reduce social supply to minors. Otherwise we think a cohesive and planned overall strategy of marketing is required to be developed in parallel with the policy planning (i.e. Category C above).

Part 2: Ensuring a smokefree 2025 is achievable

Policy articulation, then implementation, may be particularly challenging in this area, since it is highly contested by tobacco companies and their allies. Maintaining, building and extending bipartisan political leadership is critical.

Here we address two aspects arising from the MASC Report that need further development to maximise the chance of success:

- An overarching mechanism to ensure the goal is achieved by 2025; and
- Several key elements of the package that need greater emphasis and better specification.

The need for an overarching mechanism

Imagine you are the newly appointed Director of the proposed Tobacco Control Agency charged with achieving the 2025 smokefree goal. What are going to be the key mechanisms to ensure success? The MASC Report suggests a comprehensive range of measures with increased activity proposed in many effective domains of tobacco control. However, most are incremental steps, and even implementing all of these measures will not ensure that the goal is achieved by 2025. If we were the Director(s) of the agency accountable for achieving the 2025 goal, we would want the necessary legal powers, including the goal of a smokefree Aotearoa embedded in law; and we would
require an effective overarching mechanism supported by legislation and sufficient resources.

The MASC Report highlights three potential mechanisms that we think could act as the backbone for achieving the goal (together or separately): annually reducing tobacco imports such that zero retail supply is guaranteed by 2025; an ongoing series of substantial tax rises that will achieve near zero demand by 2025; or regulation of tobacco constituents (the moving to zero-nicotine cigarettes being the most obvious ‘key’ mechanisms). Decisions will be required on what over-arching mechanism New Zealand is going to use, how best to integrate this with the full package of adjuncts measures listed in the MASC Report, and how to deal with potential sequelae and ethical issues (e.g. will we need a system of licensed smokers near 2025 for those smokers who at that stage cannot quit?).

If rising tax is chosen as the best overarching mechanism, a predefined programme of sufficiently large tobacco price increases, could ensure smoking prevalence is near-zero by 2025. A series of 10% per tax rises annum may not be enough, unless accompanied by other measures such as changes to tobacco constituents, and massive increases in cessation and social marketing. We believe that achieving the smokefree goal with tax as the main mechanism will need a clear 10-15 year programme of large annual tobacco tax rises, probably at well over 20% a year. The effects would need to be well monitored, to ensure that smoking prevalence is dropping across all groups. Similar policy analysis would be needed to develop the strategies for implementing the reducing imports or zero-nicotine approaches.

Some suggested additions to the recommended measures

As well as an over-arching mechanism, we propose some additional details that may increase clarity and the chances of success of a tobacco control strategy based on the MASC Report recommendations. These activities do not need to be in place immediately; rather they can be phased into the early parts of the implementation.

Clearer goal definition—The MASC Report does not elaborate on what is meant by a ‘smokefree’ nation. We suggest that this should mean the complete end of tobacco sales and that smoking prevalence is close to zero per cent. This would not be ‘prohibition’, as it would allow for persisting smokers to consume their home-grown tobacco, or to perhaps receive tobacco under some license system.

Ensuring Maori health gains—Ensuring particularly rapid progress in reducing the tobacco burden on Māori is critical, and the MASC Report appropriately focuses on this. The Report suggests many useful strategies such as targeted funding and services, support for Māori specific responses, strong Māori participation at all levels of decision making, and monitoring of outcomes for Māori. It will be critical to ensure that Government understand the wider population support for reducing smoking rates for Māori, and that encouragement is given from all communities and agencies to ensure that recommendations aimed particularly at improving outcomes for Māori are realised.

Identifying the most cost-effective approaches—To maximise the cost-effectiveness of efforts to achieve a smokefree Aotearoa, the Government needs to clearly identify which tobacco control interventions are the most cost-effective (preferably either cost-saving or near cost neutral) to run. For instance, tobacco tax interventions can be
Revenue generating, as would a sales quota auction system. Regulations – to ensure larger pictorial health warnings and to eliminate marketing on packs and in point-of-sale displays – are also a very effective and low cost intervention (i.e. it is the industry which pays for printing the warnings on tobacco packaging). Smoking cessation approaches also need to be considered in terms of reach (especially to Māori), effectiveness and cost-effectiveness. However, we also note that there will be a need to implement measures that logically have a high chance of success, but that have not been implanted or evaluated before. We should be brave enough to implement such groundbreaking interventions, but also to evaluate them to ensure they are actually effective and cost-effective.

Reducing the power of the tobacco industry—The MASC Report recommends that Government holds the tobacco industry accountable, and proposes a range of measures to eliminate the interference of the industry in undermining public health policies, including considering embedding Article 5.3 of the Framework Convention on Tobacco Control in legislation, and legislating various aspects of the Article 5.3 Guidelines. The latter requires that “in setting and implementing their public health policies with respect to tobacco control, Parties shall act to protect these policies from commercial and other vested interests of the tobacco industry in accordance with national law.”

In addition to these highly desirable measures, we suggest at least two other policy avenues. First, legislation requiring the divestment by all public agencies, (national and local) of tobacco industry investments (manufacturing and retailing). Second, legislation requiring tobacco industry marketing, public relations, lobbying, donations and accounts to be public. This would help to limit their ‘ability to operate, to hide and to obscure their behaviour and their ability to neglect the externalities of their products and escape responsibility for them’ and facilitate implementation of Article 5.3.

Part 3: Summary, and what we need to do now

In summary, we congratulate the MASC for providing bold leadership towards ending the tobacco epidemic for Māori and for all other New Zealanders, and in setting out a comprehensive range of options in the countdown towards a smokefree nation. The MASC Report is the first New Zealand tobacco control strategy document from an ‘official’ source which proposes measures commensurate with the scale and the urgency of the ongoing public health disaster from the tobacco epidemic. We have suggested some refinements and additions about next steps, but these should not detract from the overall assessment that this is a landmark Report.

Furthermore, there are good signs that the political leadership to act on these recommendations exists (e.g. a plan for new tobacco control legislation was introduced by Hon Tariana Turia). However, getting sufficient change will also depend on the activities of advocates and health professionals in getting behind the Report, building coalitions and generating active public and media support so that politicians see action as a necessity.

So what should we and you do next? First and foremost, commend the MASC Report to colleagues, patients, friends and civil society. Second, enter the public debate about the recommendations. Third, we all need to advocate for and contribute wherever we can to the implementation of the strategy. As a health workforce we have all seen the carnage of the tobacco epidemic, and we are now starting to coalesce around the goal of being...
smokefree as a nation. We need to further communicate this goal to the whole health sector, the media and the public.

Let the countdown to a Tupeka Kore Aotearoa begin.

**Competing interests:** Although we do not consider it a competing interest, for the sake of full transparency we note that all of the authors have undertaken work for health sector agencies working in tobacco control, and were involved in making submissions to the MASC. None of the authors has any financial interest in any nicotine, pharmaceutical or tobacco company.

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**References:**

2. Ministry of Social Affairs and Health. The aim of the Tobacco Act is to put an end to smoking in Finland [Finnish government media release]. Helsinki: Ministry of Social Affairs and Health.


The B4School check—addressing the new morbidity in child health

Pat Tuohy

The publication\(^1\) of the early results from the Hawke’s Bay implementation of the Before (B4)School check in this issue of the *Journal* marks a milestone for the Well Child/Tamariki Ora programme. The publication illustrates both a willingness and opportunity to evaluate our Well Child/Tamariki Ora programme, as part of a commitment to continuously improve quality.

The results indicate that many more children are now better prepared for learning, due to the early identification and referral for problems identified by the nurses undertaking the checks. There is almost universal parent support for the programme, which provides information and reassurance that in most cases their child is doing well, and allows the parent to talk with a trained health professional about any concerns they might have about their child’s readiness for school.

The B4School check is a comprehensive preschool health check for 4-year-old children which was designed to replace the 5-year-old school entry check. The purpose of the B4School check is to “identify and address any health, behavioural, social or developmental concerns which could affect a child’s ability to get the most benefit from school”. The programme was piloted in Whanganui and Counties Manukau District Health Boards, and was fine-tuned before it was rolled out nationally in 2008.

Alongside the development of the B4School check, the Ministry undertook a systematic review of the needs of whānau/families and children to determine how best a Well Child programme might address the present and emerging issues faced by modern parents and caregivers.

We consulted widely on the findings and found that although there was a general consensus that the current system had served us well, some changes needed to be made. These changes were intended to reflect the increasing recognition of the “new morbidity” for children.\(^2\) The American Academy of Pediatrics identified the epidemiological shift away from acute infectious diseases towards chronic illness and disability and behavioural difficulties as the major conditions now facing children and families.

The Ministry’s review also identified the emerging evidence around the importance of pregnancy, parental mental health and the child’s first years of life for a healthy life course trajectory. The changes also recognised the importance of improving the quality of the Well Child/Tamariki Ora service.

The B4School check introduced validated, evidence based behavioural and developmental questionnaires, fully manualised assessments for growth, vision and hearing screening and surveillance, and collection of clinical information for every child seen into a national database.

The New Zealand Well Child/Tamariki Ora programme has over 50 providers, who provide home visiting and clinic based services to the 300,000 New Zealand children
under the age of 5 years. The nurses and kaiawhina of the Plunket Society see around 85 to 90% of these children, and a range of smaller Māori and Pacific Tamariki Ora providers care for the remainder.

Well Child nurses and general practitioners are the health professional groups who have the most contact with New Zealand’s whānau/families, mothers and children. However, the major interface between these complementary facets of primary and community care for children and their whānau/families was the occasional referral, or chance meeting in another forum.

This fragmentation of primary and community care for mothers and children has meant that the considerable investment of people, time and money in these services has not been leveraged to maximise the benefit to New Zealand families. As a result of the significant numbers of B4School checks now being delivered through PHO based primary care, general practitioners and Well Child/Tamariki Ora nurses are beginning to work more closely, and the concept of broader team-based care is now beginning to emerge.

As anticipated, the concerns about unmet needs raised in the pilots have emerged in this publication. Although increases in waiting times are seen for some specialties, these have generally been managed in a constructive and innovative fashion. Although waiting times may create anxiety and concern among parents and professionals, most children are now getting a service in a timely fashion. Before the B4School implementation some were not being identified as even having a need.

The paper from Wills et al\(^1\) in this *Journal* describes the journey that the Hawke’s Bay District Health Board took when implementing this complex, professionally demanding programme for 4-year-old children. The high degree of professionalism, enthusiasm and innovation by the child health professionals in Hawke’s Bay demonstrated the value they placed on the programme.

The DHB’s decision to contract a PHO based provider to deliver the B4School check gave an opportunity for general practice to make strong professional relationships with a range of community based Well Child providers. It also enabled general practitioners to develop their role in the provision of a universal Well Child/Tamariki Ora programme.

The other key decision made by the DHB was the implementation of a Clinical Advisory group, chaired by the Director of Paediatrics. This group provided clinical governance, and enhanced intersectoral collaboration by bringing together the major child health, education and wellbeing groups from across the Bay. The collaborative nature of the Clinical Advisory group led to high levels of parental acceptance of the programme.

If the B4School check and the new Well Child programme are implemented nationally with as much commitment as in Hawke’s Bay, then the lifetime opportunities for all New Zealand children can only be improved.
Competing interests: None.

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Reference:
Has the time come for universal varicella (chicken pox) vaccination in New Zealand?

Tony Walls, Elizabeth Wilson

In New Zealand it is generally accepted that varicella is a universal childhood illness, a necessary evil that is troublesome but usually benign. Those of us who work in hospital paediatrics have a different perspective on this highly transmissible viral infection. Severe morbidity from suppurative or neurological complications of varicella, necrotising fasciitis, or even death of immune-compromised children, is as unacceptable as tetanus or other vaccine-preventable disease when very effective varicella vaccines have been available for over a decade.

In this issue of the Journal, de Almeida et al report a case of life-threatening pericardial tamponade in a young child as a complication of primary varicella infection (http://www.nzma.org.nz/journal/123-1326/4436). She developed a secondary infection with Staphylococcus aureus and required pericardectomy and a lengthy course of intravenous antibiotics. It is likely that this illness could have been prevented had she received varicella vaccination.

Varicella is not a notifiable disease in New Zealand, but its annual incidence should approximate the birth cohort, currently 60,000 per year, with almost 90% of cases occurring in childhood. Approximately one to two cases per year result in long-term disability or death, and 0.5–1 cases result in severe congenital varicella syndrome.

In temperate climates the rates of hospitalisation with varicella are highest in children 0–4 years, more than 20 times that for those >15 years of age, although the risk of severe disease, usually with varicella pneumonitis, increases with age. New Zealand hospital admission numbers have increased from approximately 50 per annum in 1970 to approximately 300 in 2002. Most of these hospitalisations occur in people without underlying medical conditions, with only 4% of hospitalisations involving people with an underlying immune deficiency.

It is likely that these numbers are an underestimate: Some complications such as acute demyelinating encephalomyelitis (ADEM) or stroke occur after the rash has disappeared, and the risk of skin and soft tissue or invasive infections due to Group A Streptococcus and Staphylococcus aureus persists for several weeks after chicken pox, meaning some cases may not be linked to the prior infection in discharge documentation.

There are other costs associated with varicella in hospital that may go unrecognised. As the infectious period for varicella begins 2 days prior to the rash many inadvertent nosocomial exposures occur when children admitted for other reasons, or siblings visiting hospital, develop chicken pox. The ensuing infection control and disease prevention measures are time and resource-costly. A prospective survey a Starship Hospital in 2002 conservatively estimated the hospital costs of varicella at $70,000 in
6 months despite there being no death or severe complicated case during the survey period.\textsuperscript{4}

A varicella vaccine has been available in New Zealand since 1996 and there are currently two licensed vaccines. Vaccination is recommended, but not funded, for adults and adolescents with no history of varicella infection who have lived in tropical countries (the virus does not circulate so efficiently in tropical climates and childhood infection may not have occurred), children with chronic liver disease, and children who are likely to develop severe immunosuppression. Parents may obtain the vaccine for their children but, at a cost of about $70, it is inaccessible to most.

In 1999 Scuffham et al\textsuperscript{5} investigated the cost-effectiveness of universal varicella vaccination in New Zealand. Based on high vaccine efficacy and assuming 90\% immunisation coverage they concluded that varicella vaccination would be cost beneficial from a societal perspective, with a return of $2.79 for every dollar spent on the programme. The bulk of the savings came from reduction in loss of work productivity through time parents would be required to spend caring for children. This reflects the greatest burden of disease being in those mildly affected not requiring hospitalisation.

At the time the MOH Varicella Working Party did not recommend inclusion of varicella vaccine in the immunisation schedule\textsuperscript{1} partly to limit changes to a newly introduced schedule and partly because of limited international experience with universal varicella vaccination.

Over a decade later, universal varicella vaccination has been shown to be highly effective in reducing complications of varicella infection. It was introduced in the United States in 1995, and by 2001 coverage rates exceeded 75\% in children 19 to 35 months of age. There has been a 66\% and 53\% decrease in varicella-related ambulatory and hospital discharges respectively, compared with the prelicensure period.\textsuperscript{6}

Following universal varicella vaccination introduction in Germany in 2004, a country-wide surveillance system showed a 63\% reduction in reported cases of varicella between 2005 and 2009.\textsuperscript{7} Importantly, there was an 83\% reduction in reports of varicella complications for children under 9 years of age. A large proportion (36\%) of complications of varicella were bacterial superinfections, most commonly superficial skin infections.

A combined measles-mumps-rubella-varicella (MMRV) vaccine, licensed in the United States in 2005, allows delivery of two doses of varicella vaccine at the current scheduled times for MMR. Unfortunately this new vaccine appears to have a slightly higher rate of fever, rash and possibly febrile convulsions in the 7–10 day period post-vaccination when compared to MMR and varicella vaccines being given separately.\textsuperscript{8}

Whilst the addition of varicella vaccination to the New Zealand schedule would not necessarily mean additional visits for children an extra injection might be required at the 15 month visit if the febrile convolution risk of MMRV were considered unacceptable.

Two factors make it important that New Zealand does not fall behind in use of this vaccine: firstly we know that we have a high burden of staphylococcal and
streptococcal\textsuperscript{10} disease, the commonest causes of secondary infection; in the absence of vaccines for these organisms varicella is a modifiable risk factor.

Secondly, we are sufficiently affluent to practise quaternary medicine resulting in increasing numbers of surviving solid organ and bone marrow transplant recipients as well as other immune-suppressed patients on chemotherapy and rheumatologic agents. These patients, in whom so much has already been invested, cannot be immunised themselves but we should be protecting them by immunising at least those closest to them, if not the whole community.

Chicken pox is generally thought of as a mild illness in children. However, as de Almeida’s case illustrates, a small proportion of children develop severe complications. The introduction of universal varicella vaccination in New Zealand has been recommended to the Ministry of Health by the Immunisation Technical Forum\textsuperscript{11} and will be given further consideration. Vaccination now has a proven track record and is likely to be cost effective, significantly reduce secondary complications and severe disease, and prevent deaths.

**Competing interests:** None.

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**References:**


The role of sociocultural factors in obesity aetiology in Pacific adolescents and their parents: a mixed-methods study in Auckland, New Zealand

Tasileta Teevale, David R Thomas, Robert Scragg, Gavin Faeamani, Vili Nosa

Abstract

Aim To explore sociocultural factors that may promote or prevent obesity in Pacific communities in New Zealand. Specific objectives were to describe the behaviours, beliefs and values of Pacific adolescents and their parents, related to food consumption and physical activity and to examine the patterns among obese and non-obese Pacific adolescents and their parents.

Methods A self-completion questionnaire was administered to 2495 Pacific students who participated in the New Zealand arm of the Obesity Prevention In Communities (OPIC) project, with quantitative comparisons between 782 obese and 814 healthy weight students. Sixty-eight people (33 adolescents and 35 parents) from 30 Pacific households were interviewed in the qualitative phase of the study.

Results Healthy eating and higher levels of physical activity were related to parental presence at home, parental occupational type (non-shift) and better health education and experience. Obese adolescents held the same attitudes, beliefs and values about food and physical activity as their healthy-weight counterparts, but these factors were not protective for obesity-risk.

Conclusion This study indicates that social status and environmental factors related to poverty affect the health-promoting behaviours of Pacific communities in New Zealand. To address obesity in Pacific youth, specific macro-environmental changes are recommended including food pricing control policies to mitigate healthy food costs, revising sustained employment hour policies, making changes to school food and physical activity environments.

The South Pacific region has the highest rates of obesity in the world. However, of particular concern is the higher prevalence observed in Pacific population groups in New Zealand. Pacific adults (63.7%) and children (23.3%) have an almost three-fold higher risk of being obese compared to the general population (26.5% for adults; 8.3% for children). These disparate prevalences and the lack of empirical data to support the development of preventive and management actions to address obesity among Pacific populations in New Zealand, is the key motivation behind the current study.

Current evidence from obesity aetiology suggests environmental factors are more influential in the rapid increase of population obesity levels than determinants such as evolutionary genetic changes. In particular, social changes in modern environments seem to track the observed increases in obesity rates.
Social factors are considered the most important influence on the prevalence of obesity although few investigations have examined the associations between sociocultural variables and obesity-risk behaviours related to eating and physical activity. Potential sociocultural (or socioenvironmental) determinants of obesity include social circumstances, such as economic and material wealth, social norms regarding physical activity and eating, levels of social support for obesity-protective behaviours, social and cultural customs, beliefs, values or expectations for what is important in relation to the role of food or the acceptability of vigorous exercise.  

Obesity research reviews have also reinforced the role that primary caregivers have over children and adolescent health behaviours. Parents often control the resources for adolescent lifestyles and values about food, diet and physical activity may also be influenced by parents and other caregivers. This study assumed that, for Pacific adolescents socialised in traditional Pacific cultural milieu, the influence of parents was a critical area for investigation, and the study therefore included Pacific parents as key participants.

This study was an affiliated sub-study to the larger Obesity Prevention in Communities (OPIC) project and this sub-study formed the basis of a University of Auckland PhD doctoral thesis for the first author. Further description of the OPIC study sample and methodology is available in other sources.

**Method**

**Study design**—The overall aim of the research was to explore sociocultural factors, such as community behaviours, beliefs and values that may promote or prevent obesity in Pacific communities. To further support the development of future obesity intervention or management programmes for Pacific communities in New Zealand the study used a solution-focused paradigm, or appreciative inquiry lens, to explore the factors that influence non-obese states.

The specific objectives were to:

- Investigate culturally specific beliefs, values and practices around food, eating and physical activity; and
- Compare the responses of obese Pacific adolescents and their parents to their non-obese or healthy weight counterparts.

A mixed-methods research design including both qualitative and quantitative research methods was used. Given the lack of research on sociocultural factors and obesity risk for Pacific populations in New Zealand, qualitative methods were used to allow the topic to be explored in depth.

**Quantitative survey questionnaire**—Information was collected from 2495 Pacific students who participated in the New Zealand arm of the OPIC project. Analysis presented in this paper include results for obese and healthy weight students only (n=1596). Students were surveyed at secondary schools. The questionnaire items included demographic variables, anthropometry, food and nutrition behaviours, physical activity and leisure time activities, and questions relating to family, home, school and neighbourhood environments. Anthropometric measurements such as weight were taken using an electronic scale (BC418 Body Composition Analyzer, Tanita, UK), and height was measured to the nearest 0.1 cm with a standard portable stadiometer. Students’ weight status was assessed using BMI measurements and international cut-off points recommended by the International Obesity Taskforce. In this survey, ethnicity was measured using a forced one-choice question. This study compared prevalence of outcomes between comparison groups, which is appropriate for cross-sectional studies. Chi-squared tests were used to determine the relationship in comparisons involving two variables and statistical significance was set at p<0.05. Statistical software SAS (v 9.1, SAS Institute Inc., Cary, NC, USA) was used to generate results. Relative risks were calculated to adjust for possible confounders using the Mantel-Haenszel method and p-values are reported along with the crude proportions.
Qualitative interviews—Sixty-eight individuals (33 students and 35 parents) from 30 Pacific households participated in the qualitative phase of the study. Students were recruited for individual interviews if they had completed the OPIC baseline questionnaire. Students were randomly selected for the interviews, depending on weight status (healthy weight and obese students only). In the qualitative interviews, students chose multiple ethnicities.

The scope of the interview included questions on participants’ eating and physical activity patterns, the influences on behaviour, and knowledge, beliefs or values about the health consequences of physical activity and food and eating habits.

Household location was deemed important for comparing equivalent environmental influences so families were recruited from the catchment area of the Mangere ward. Interview sessions included at least one adult parent or primary caregiver and a separate interview was conducted with their child/student. Five parent interview sessions included both parents present. Interview sessions progressed until information saturation was reached.

Integral to the research process and in alignment with indigenous Pacific research principles, particular cultural processes and strategies were followed for interviews. Participant consent was achieved for all participants and the study met the University of Auckland’s Human Participants Ethics Committee standards for undertaking research.

In the qualitative component, interview transcripts were transcribed and analysed using the grounded theory inductive approach described by Strauss and Corbin. This technique enables the systematic identification, categorising and sorting of key themes and sub-themes running through text segments in the transcripts. NVivo7 (a software program) was used to analyse, sort and code interview data.

Results

Demographic composition of study samples

Table 1 details the key demographic variables amongst the Pacific students recruited in the quantitative survey sample only showing heterogeneity (or otherwise) across variables. Results showed a difference in weight status by ethnicity, with a lower proportion of Cook Island students, and higher proportion of Samoan and Tongan students among the obese students compared to their proportions among healthy weight students.

Table 1. Weight status by key demographic variables amongst Pacific students in quantitative survey (n=1596)

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Weight status</th>
<th>Obese (n=782)</th>
<th>Healthy weight (n=814)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>386</td>
<td>49.4%</td>
<td>403</td>
</tr>
<tr>
<td>Girls</td>
<td>396</td>
<td>50.6%</td>
<td>411</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12–13</td>
<td>276</td>
<td>35.3%</td>
<td>299</td>
</tr>
<tr>
<td>14</td>
<td>165</td>
<td>21.1%</td>
<td>192</td>
</tr>
<tr>
<td>15</td>
<td>130</td>
<td>16.6%</td>
<td>133</td>
</tr>
<tr>
<td>16</td>
<td>125</td>
<td>16.0%</td>
<td>119</td>
</tr>
<tr>
<td>17</td>
<td>86</td>
<td>11.0%</td>
<td>71</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samoan</td>
<td>387</td>
<td>49.5%</td>
<td>329</td>
</tr>
<tr>
<td>Cook Island</td>
<td>133</td>
<td>17.0%</td>
<td>220</td>
</tr>
<tr>
<td>Tongan</td>
<td>195</td>
<td>24.9%</td>
<td>173</td>
</tr>
<tr>
<td>Other Pacific</td>
<td>67</td>
<td>8.6%</td>
<td>92</td>
</tr>
</tbody>
</table>

P value

0.95

0.09

0.09
Of the 33 students interviewed in the qualitative survey, 11 identified with multiple ethnicities (30% multi-ethnic cases). Most of the households had one or more adults who were employed (25 out of 30 or 83%), and they had a combined parental income in the low-mid range of $30–$60K per annum (not adjusted for total household size). Most families (21 out of 30 or 70%) lived in extended families, most parents were Island-born (26 out of 30 or 86%), were bilingual (26 out of 30 or 86%) and 9 out of 30 (30%) were mixed parental-ethnicity households.

The key differences between households of healthy weight and obese students was in parental presence at home, with healthy weight student households more likely to have a full-time or part-time parent at home (13 out of 15 or 86% compared to 8 out of 15 or 53% for obese student households), while obese student households had parents that were more likely to be working in shift type working arrangements (6 out of 11 employed households or 54% compared to 1 out of 12 or 8% of households with a healthy weight student). Healthy weight student-parent pairs also came from larger household sizes (average 8.3 compared to 5.3 for obese households) with greater numbers of dependent children (average 4.3 compared to 2.5 for obese households).

**Food consumption patterns**

In the quantitative survey, students were asked “In the last 5 school days, on how many days did you have something to eat for breakfast before school started?” The question was repeated for eating lunch across the five school days. Table 2 shows that by weight status, obese Pacific adolescents were less likely to regularly consume (i.e. 4–5 days) breakfast (45.4%) or lunch meals (55.6%) compared to their healthy weight Pacific counterparts (breakfast 56.8%, lunch consumption 70.7%).

<table>
<thead>
<tr>
<th>Times in the last 5 school days</th>
<th>Obese (n=782)</th>
<th>Healthy weight (n=814)</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–1 days</td>
<td>11.7%</td>
<td>8.9%</td>
<td>0.0077</td>
</tr>
<tr>
<td>2–3</td>
<td>42.9%</td>
<td>34.3%</td>
<td>0.0013</td>
</tr>
<tr>
<td>4–5</td>
<td>45.4%</td>
<td>56.8%</td>
<td>Reference</td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–1 days</td>
<td>8.6%</td>
<td>6.3%</td>
<td>0.0047</td>
</tr>
<tr>
<td>2–3</td>
<td>35.8%</td>
<td>23.0%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>4–5</td>
<td>55.6%</td>
<td>70.7%</td>
<td>Reference</td>
</tr>
</tbody>
</table>

* P value adjusted for age, gender and Pacific ethnicity.

These questions were repeated in the qualitative interviews and analysis confirmed the patterns shown by the quantitative data. That is, from the interview sample more healthy weight Pacific students (12 out of 17 or 70%) regularly ate breakfast on most school days compared to only 5 out of 16 (or 31%, p=0.056) of obese Pacific students. More parents of healthy weight students (11 out of 15, or 73%) reported regular consumption of breakfast but only 5 out of 15 (or 33%, p=0.067) of parents with an obese student reported regular breakfast intake. For both adolescents and their
parents, lack of available time was the main reason for not eating breakfast in the morning.

In the qualitative interviews, adolescents and parents were asked to identify foods they typically consumed for their main meal of the day (i.e., evening meals). Typically consumed foods differed between obese and healthy weight adolescent-parent pairs. Vegetables were identified by healthy weight adolescents and their parents as being a typically consumed food item for dinner evening meals, whilst parents with an obese child did not mention vegetables. They stated sausages as being a typically consumed food item. All other food items were similar.

**Food knowledge**

Students and parents were asked during the interviews to state foods they deemed healthy and unhealthy. All students and parents (i.e. 33 students and 35 parents or 100%) regardless of adolescent weight status, were knowledgeable about healthy versus unhealthy foods, for example, vegetables, fruits and water were rated healthy, and fizzy drinks, takeaways and chocolates or sweets were rated unhealthy. However, parents explained that cost, affordability and time restraints were more influential on food choices and habits than food knowledge alone.

...People eat bad foods because it’s cheap I think. Like you can go and get $10 worth of fish and chips if we have that our whole family would be eating that, you couldn’t finish it...I do know what’s right and what’s wrong, for me its expensive. Usually we will eat white bread, [its] cheap, it’s 89 cents a loaf, I can get two or three loaves of that and then the kids will get full up on that, but I know its not good for you...I mean I’m not going to go out and buy Vogel [bread brand] everyday cos they are like $5 a loaf, you know, I only buy those ones that cost a $1 something...I know what to do, but it’s just hard on the pocket.  

(NZ Māori/European/Samoan household with 2 dependant children, part-time cleaner & beneficiary, household size 6)

In the qualitative interviews, adolescents rated parents and other household members as the main sources of food knowledge and encouragement to eat healthy foods. There was a small difference by weight status, with healthy weight adolescents rating school educational classes and staff just as important as the family environment, whereas obese adolescents did not. However, one student was able to explain that despite all of the numerous sources of food knowledge resulting in good personal understanding of healthful foods it was still difficult to practice healthy eating surrounded by an obesogenic environment of easily accessible unhealthy foods.

...I get information about foods from my mother, cos my mother’s a nurse, and the health council at school, and a nutritionist came to talk to our whole class. Also sometimes from TV, like those obesity programmes like Downtime Me and the Biggest Loser. ...Takeaways, coffee, fizzy drinks, lots, really I would say there is more bad food out there than there is good, so, its kinda hard to stop having all the bad foods that’s out there, like takeaways.  

(Cook Island/NZ Maori, female, Age 17, classified obese)

Parents rated health professionals like doctors, diabetes nurses, dietitians, family members and media sources equally high as key sources of food knowledge. Nutritional knowledge was also related to prior experience and those that worked in health related fields or health employment places had working experiences that seemed vital in affirming knowledge about food.

**Food supply and preparation**—In the qualitative interviews adolescents and parents were asked to identify who typically made the household food decisions (i.e.
purchased and sourced household food), and if this was the parent being interviewed, to further explain what determined food supply and preparation decisions. This study found that mothers were typically responsible for food supply and preparation of household foods. Food pricing and affordability was the key purchasing factor for all Pacific households irrespective of adolescent weight status. Food supply was reliant on available monetary resources and for low-income large-member households, food insecurity occasions were regular and was a constant cause of stress for parents, as highlighted by comments below:

…Yeah, it’s true sometimes you know if I make the dinner and its not enough, sometimes I never eat, you know, mums are always like that, I have to feed them [the kids] first, it doesn’t matter about me… you can’t eat and leave your kids hungry. Sometimes you know my husband he always tries to eat first and then I say [to him] ‘you better be second, so the kids can eat first and then we see what they left, that’s for us’
(Tongan mother of 7 dependent children, at-home parent, household size 13)

Employment time particularly for those on shift work arrangements encroached on food preparation and takeaway ready-made meals was the default choice for family evening meals. The most popular food items supplied, prepared and consumed were those that were cheap and took little time to prepare.

…Sometimes during the week, if I don’t cook cos normally I have to go early [to work] like today, then I say to them [kids], ‘what are you going to have for dinner?’, ‘oh, I don’t know’, ‘get some fish and chips or buy some takeaways’, and then they will have that
(Samoan mother of 2 dependent children, cleaner, household size 6)

**Physical activity**

**Physical activity levels**—Physical activity status of adolescents was assessed in the quantitative survey with three questions which inquired about the frequency of activity across three school-time recess periods in the previous school week. Adolescents responded to the question ‘Over the last 5 school days, what did you do most of the time at morning recess/interval (apart from eating)?’ The question was repeated for “lunch time” and students had three responses to choose from: (1) Mostly just sat down; (2) Mostly stood or walked around; (3) Mostly played active games. The responses were dichotomised into two categories, with choices (1) and (2) combined as the ‘Inactive’ category and choice (3) as ‘Active’.

After-school activity was assessed with the question, “In the last 5 school days, on how many days after school, did you do sports, dance, cultural performances or play games in which you were active? There were 6 possible responses from 0 to 5 days. The responses were dichotomised into two categories of activity of 5 days and less than 5 days. Table 3 shows Pacific students’ activity by weight status. Healthy weight adolescents were more frequently active than obese adolescents and the difference was significant particularly during school lunchtimes.

The qualitative interview data confirmed that the most active students were of healthy weight status. Adolescents provided information on weekly frequency of activity, and the pattern of activities including, duration, intensity, seasonal variation, and historical participation. Activity status was assessed against current definitions of activity and inactivity using Ministry of Health guidelines.³ Thirteen out of 17 (76%) healthy weight adolescents interviewed were currently active compared to 3 out of 16 obese students (19%, p=0.003).
Table 3. Proportion (%) of Pacific students’ and their activity across three school-time recess periods by weight status \((n=1596)\)

<table>
<thead>
<tr>
<th>Activity by time period</th>
<th>Obese ((n=782))</th>
<th>Healthy weight ((n=814))</th>
<th>(P) value*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interval recess</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Mostly sat or walked&quot;</td>
<td>69.3%</td>
<td>65.2%</td>
<td>0.09</td>
</tr>
<tr>
<td>&quot;Mostly active&quot;</td>
<td>30.7%</td>
<td>34.8%</td>
<td>Reference</td>
</tr>
<tr>
<td><strong>Lunchtime</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Mostly sat or walked”</td>
<td>62.5%</td>
<td>56.3%</td>
<td>0.0062</td>
</tr>
<tr>
<td>“Mostly active”</td>
<td>37.5%</td>
<td>43.7%</td>
<td>Reference</td>
</tr>
<tr>
<td><strong>After school</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“0–4 days”</td>
<td>75.2%</td>
<td>70.3%</td>
<td>0.06</td>
</tr>
<tr>
<td>“5 days”</td>
<td>24.8%</td>
<td>29.7%</td>
<td>Reference</td>
</tr>
</tbody>
</table>

* P-value adjusted for age, gender and Pacific ethnicity

Reasons for adolescents’ being active (i.e. “to have fun”, “achievement motivations”; “finding challenges”; “for better health” and “historical habit”) and inactive (i.e., “not having skills to be selected for school teams”; “not having money for joining activities/sports/gym fees”; “No transport between home and sports activities, important for safety reasons”; “not enough time, competing activities like school work and church activities” and “needing friends or family members to train or join teams with”), were common across groups and consistent with reasons reported in current literature.17–19

All (except one) of the obese students who were currently inactive used to be active in sporting activities when they were younger usually at primary or intermediate schools. Drop-out from sports activities usually took place when they entered high school or senior school levels. Students explained that inactivity was related to finding the school sporting environment too competitive and that organised school activities did not meet their primary motive for physical activity participation, which was to have fun and enjoyment of the activity.

…Yeah, I used to play netball, that was for intermediate and primary [school]

[Interviewer] What made you stop playing?
Cos for previous seasons it was just for fun and now they’re too serious, whereas at intermediate [school] it was more like muck around and having fun. But now that we’re at high school the trainings are really serious you have to be there, you have to be there on time, otherwise you get laps or something. But I think they’re worth it cos they [school team] won their grade"

(Samoan/Niuean, female, Age 16, classified obese).

In the interviews, students were asked if they would like to increase or decrease their current level of activity. Obese students desired more future activity than healthy weight students. The barriers for future activity were the same for reasons for inactivity, that is, “needing friends or family members to train with or to join teams with”; “not having enough money for sports/gym fees”; “no transport between home and sports venues for safety reasons”; and “not having the skills to be selected for school teams” were the main reasons given as barriers to future activity.
Physical activity beliefs and values—To assess students and parents beliefs about physical activity and its relationship to healthy weight, in the interviews, participants responded to the question, ‘Do you think there is any link between physical activity and being of a healthy weight?’

This study found adolescents and their parents held the same beliefs and values for physical activity’ regardless of adolescent weight status. There was a small difference between obese versus healthy weight students with more obese students (12 out of 16, or 75%) stating there was a positive link between being physically active and body weight, and comparatively less healthy weight students (9 out of 17 or 53%, p=0.34) believed there was a positive link. Most students (21 from 33, or 64%) attributed body weight, described as bigness and thinness, to both inactivity and over-consumption of food.

Most students (30 from 33, or 90%) valued physical activity and regardless of weight status, all students thought it was important to participate in daily physical activity. When students were asked why doing physical activity was important, most stated the health benefits of physical activity, for example, “to increase energy”, “to live a long life”, “to be physically fit and healthy”. Most affirmed this knowledge was derived from taking health class at their school. Most students were able to correctly identify the recommended dosage of physical activity required per week to gain health benefits.

Most parents (27 from 30 or 90%) were knowledgeable about the health benefits of physical activity, and made a positive link between physical activity and healthy weight. This included knowledge about the recommended dosage of physical activity required for health benefits.

Parents, like the students, valued physical activity mainly for the “good health” of their children, because it “kept them off the street”, for increasing children’s self-esteem, self-confidence and giving them a “competitive edge”, because it was prescribed by doctors to manage chronic conditions, (e.g., child’s disability) and lastly, because being active “is being part of a kid”. Parents valued physical activity for their children and were happy to sacrifice their own physical activity to support their children’s interests.

Discussion

The results of this study found that socioeconomic circumstances determined food and physical activity behaviours more than cultural beliefs and values about food and activity. This analysis has important implications for obesity interventions, as framing the determinants of healthy eating and physical activity between individual cultural and social structural factors will determine the appropriate interventions. A key implication for interventions is that if food and physical activity habits are influenced more by structural factors rather than cultural, then interventions that address structural barriers should prove more effective.

This study supports the evidence from other studies which found that cost and affordability of food was found to be the main barrier to healthful eating and this should therefore be addressed as the intervention priority.20–22
Food price is a particularly important consumption determinant among low-income groups and therefore has the greatest potential to reducing health inequities in low income groups. Food price controls can involve either increasing the prices of foods which contribute to an unbalanced diet and or reducing the price of foods which would contribute to a more balanced nutritional intake. Supplementary grants for food purchases could mitigate food insecurity for such families. Food policies that directly impact on the cost of healthy food, for example, removing Goods and Services Tax (GST) on healthy foods will address perceptions of expense and affordability particularly important for low-income population groups.

Time constraint was also a key barrier to healthful eating which is consistent with other studies. Analysis of household demographic variables across student weight status showed obese students’ parents were absent due to employment such as working shifts. There is a case for making policy changes to continuous work time arrangements particularly in occupations requiring personnel to work longer than ten hours. For Pacific families overrepresented in low-skilled, low-income shift work occupations, these employment law changes are more pertinent. Government policies that support the well-being of families, by ensuring better work-life balance, should be prioritised.

Habitual levels of physical activity were different between healthy weight and obese Pacific students. The current high school sporting environments does well to support students with exceptional sporting skills. However, those with average ability but an enjoyment of sports and active leisure are often left out of school sporting opportunities. Changes need to occur within school environments to maintain the interest of Pacific young people in sporting activities. This is likely to require further government funding support for both facilities, equipment and given the decline of community volunteerism, sports and physical education personnel.

Students’ reasons for drop-out in activity matched their perceived barriers for future activity. To mitigate the structural barriers, interventionists can address monetary cost and transport for safety, by subsiding sports fees and providing transport for after-school activities. As found in other studies, safe transportation between home, school and sports venues is important for low-income communities resident in high-crime neighbourhoods.

Parents and particularly mothers, were identified as the most influential person for adolescent food habits. These results suggest the home environment and the family unit (or extended family unit) is the most influential for promoting health behaviours among Pacific adolescents. This provides further support for family-based intervention strategies to address childhood and adolescent obesity.

Conclusion

It is very likely that the recommendations suggested here have been presented before while political and policy response has been slow. Some authors explain this is due to dominant cultural values such as ‘free will’ and ‘individual right’ which run counter to public health goals like ‘health equity for all’. This has led subsequent governments to promote contradictory messages like “lose weight but enjoy the market-based offerings that encourage weight gain.”
Policymakers are therefore encouraged to assess outcome impacts carefully as proposed policy change will no doubt impact on commercial interests of other groups. However these repercussions should also be carefully assessed against future government health-related costs should no action be taken to remedy obesity risk for Pacific groups.

Health prevention is a desirable economic-impact policy approach to take over increasing health care costs and the long-lasting effect of children’s health status tracking into adulthood should compel those in power towards immediate policy action. Governments also need to be more explicit and act upon its own health goals and values particularly where it values positive health standards as a right for all New Zealanders.

Competing interests: None.

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References:


Body image and body change strategies among Tongan adolescents in Tonga and New Zealand

Marita P McCabe, Kalesita Fotu, Helen Mavoa, Gavin Faeamani

Abstract

Aim The aim of this study was to evaluate the body image and body change strategies of adolescents from Tonga, and Tongans who are resident New Zealand.

Method In total, 598 Tongans from Tonga and 388 Tongans from New Zealand completed measures of body image, body change strategies and messages about their body.

Results Tongans in Tonga were more likely to receive positive messages about a larger body from adults at school, church and the media, and losing weight from the media. They were also more likely to adopt strategies to lose weight, increase weight and increase muscles.

Conclusion The large body ideal appears to be still valued in Tonga, whereas Tongans also want to lose weight because of media messages to achieve a healthy body weight.

Being slim is highly valued within contemporary Western Society, particularly among females, for whom thinness is often associated with such attributes as attractiveness, self-control and economic success. Western culture also values a muscular mesomorphic body shape for males, emphasising muscle mass and physical bulk.

Although the above findings have been obtained for males and females in Western societies, it is not clear if these body ideals are universal. In particular, it is not clear if these ideals are now prevalent in countries where a large body ideal has previously been valued. The current study examined this issue among Tongan adolescents, who have traditionally valued a large body size for both males and females. This was traditionally a symbol of a high level of family care, and a large body led to increased power and prestige within Tongan society. These ideals applied to both males and females.

More recently, a large body has been shown to be also valuable for boys in the sporting arena. Previous research had demonstrated that adolescent Tongan boys place a high value on masculinity. This research has indicated that the focus was primarily driven by factors related to strength, sporting ability, and the capacity to engage in physical work. Research by McCabe et al also found that there was a high level of sociocultural pressures from parents, friends and the media on Tongan adolescent boys regarding their body size.

In the last two decades, Tongans have experienced greater exposure to Western influences through the media. For Tongans living in Tonga, this is also supplemented by messages from the large number of relatives who live outside Tonga, but maintain contact with their family living in Tonga. This contact has led to a shift towards body ideals for both males and females being thinner than traditional ideal bodies both among Tongans and other Pacific Islanders. Tongans have migrated to Western countries, in particular, New
Zealand. In fact, there were 50,468 Tongans in New Zealand in 2006, a 24% increase since the 2001 census.\textsuperscript{13} Fifty-six percent of these Tongans were born in New Zealand, with the remainder primarily being born in Tonga\textsuperscript{13}. One would expect that Tongans living in New Zealand would be more likely than Tongans in Tonga to adopt body image ideals closer to those valued by Western societies, due to their greater exposure to images of these bodies.\textsuperscript{6}

No studies were located that have examined the differences in the body image, body change strategies, or sociocultural influences on Tongans in Tonga and those who have migrated to countries where adolescents are more likely to experience Western influences in relation to ideal body size. However, Metcalf, Scragg, Willoughby, Finau, and Tipene-Leach\textsuperscript{14} found that Pacific Island people in general who were living in New Zealand were more likely to be overweight and obese than European New Zealanders, and perceived that a larger body size was acceptable. Likewise, Brewis et al\textsuperscript{11} found that Samoans in both Samoa and New Zealand displayed a high level of obesity, but did not perceive themselves to be obese, and were no more likely to be attempting to lose weight compared to their slimmer peers.

Many Tongan males and females have been classified as overweight or obese.\textsuperscript{15,16,17} While thin females and muscular males are ascribed positive qualities or traits in Western society, overweight individuals are often stigmatised and discriminated against in many facets of their lives, including education, employment, health care and social settings.\textsuperscript{18} What is not clear is the extent to which Tongan adolescents have internalized Western attitudes to obesity, and modified their behaviours to reduce their weight.

The current study was designed to investigate the nature of the messages that Tongans received from influential sociocultural agents about their weight (adults at home, adults at church, media). It also examined levels of body dissatisfaction, as well as the adoption of strategies to lose weight, increase weight and increase muscles.

It was expected that Tongans in Tonga compared to Tongans in New Zealand would receive fewer messages to lose weight, but more messages to increase weight and increase muscles from all of the sociocultural agents. It was also expected that Tongans in Tonga compared to Tongans in New Zealand would have lower levels of body dissatisfaction and strategies to lose weight, but higher strategies to increase weight and increase muscles.

Adolescents with a higher body mass index (BMI) in both groups were expected to receive more messages to lose weight, evidence higher levels of body dissatisfaction, and adopt more strategies to lose weight.

**Method**

**Participants**—In total, 598 Tongans living in Nuku’alofa, Tonga (301 males, 297 females), and 388 Tongans living in South Auckland, New Zealand (143 males, 245 females) participated in the study. The weight status and age groups of the participants is summarized in Table 1. All participants were drawn from lower middle class socioeconomic groups.
Table 1. Number of participants by cultural group, sex, BMI status and age

<table>
<thead>
<tr>
<th>Cultural group</th>
<th>N</th>
<th>Females</th>
<th>Mean BMI (SD)</th>
<th>Males</th>
<th>Mean BMI (SD)</th>
<th>Healthy weight</th>
<th>Overweight/obese</th>
<th>&lt;13yrs</th>
<th>14–15yrs</th>
<th>&gt;16yrs</th>
<th>Mean age (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonga</td>
<td>598</td>
<td></td>
<td>25.78 (4.24)</td>
<td>301</td>
<td>22.75 (4.00)</td>
<td>306</td>
<td>292</td>
<td>146</td>
<td>239</td>
<td>213</td>
<td>15.0 (1.84)</td>
</tr>
<tr>
<td>New Zealand</td>
<td>388</td>
<td></td>
<td>28.20 (5.90)</td>
<td>143</td>
<td>27.75 (5.86)</td>
<td>88</td>
<td>300</td>
<td>86</td>
<td>110</td>
<td>192</td>
<td>15.4 (2.21)</td>
</tr>
</tbody>
</table>

Table 2. Means and standard deviations for Tongans from Tonga and New Zealand

<table>
<thead>
<tr>
<th>Cultural group</th>
<th>Strategies to lose weight</th>
<th>Strategies to increase weight</th>
<th>Strategies to increase muscles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>New Zealand</td>
<td>8.41</td>
<td>3.19</td>
<td>8.09</td>
</tr>
</tbody>
</table>

Table 3. Means and standard deviations for messages from adults for Tongans from Tonga and New Zealand

<table>
<thead>
<tr>
<th>Cultural group</th>
<th>Male Adults at school/weight and shape</th>
<th>Female Adults at school/weight and shape</th>
<th>HW Adults at school/weight and shape</th>
<th>OW/OB Adults at school/weight and shape</th>
<th>Male Adults at church/weight and shape</th>
<th>Female Adults at church/weight and shape</th>
<th>HW Adults at church/weight and shape</th>
<th>OW/OB Adults at church/weight and shape</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Tonga</td>
<td>6.6</td>
<td>1.22</td>
<td>6.33</td>
<td>1.27</td>
<td>6.63</td>
<td>1.28</td>
<td>6.3</td>
<td>1.21</td>
</tr>
<tr>
<td>NZ</td>
<td>6.03</td>
<td>1.08</td>
<td>5.79</td>
<td>1.06</td>
<td>5.52</td>
<td>.98</td>
<td>5.91</td>
<td>1.09</td>
</tr>
<tr>
<td>Tonga</td>
<td>6.48</td>
<td>1.25</td>
<td>5.79</td>
<td>1.24</td>
<td>6.2</td>
<td>1.26</td>
<td>6.0</td>
<td>1.27</td>
</tr>
<tr>
<td>NZ</td>
<td>5.52</td>
<td>1.04</td>
<td>5.49</td>
<td>1.03</td>
<td>5.22</td>
<td>.96</td>
<td>5.55</td>
<td>1.04</td>
</tr>
</tbody>
</table>

NZ=New Zealand; OW=overweight; OB=obese; HW=healthy weight.
Table 4. Means and standard deviations for body dissatisfaction for Tongans from Tonga and New Zealand

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Healthy weight</th>
<th>Overweight/obese</th>
<th>Male</th>
<th>Female</th>
<th>Healthy weight</th>
<th>Overweight/obese</th>
<th>Male</th>
<th>Female</th>
<th>Healthy weight</th>
<th>Overweight/obese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Dissatisfaction with lower body</td>
<td>2.43</td>
<td>1.19</td>
<td>2.69</td>
<td>1.36</td>
<td>2.41</td>
<td>1.26</td>
<td>2.84</td>
<td>1.45</td>
<td>2.47</td>
<td>1.32</td>
<td>2.79</td>
<td>1.42</td>
</tr>
<tr>
<td>Dissatisfaction with middle body</td>
<td>2.74</td>
<td>1.14</td>
<td>2.67</td>
<td>1.18</td>
<td>2.66</td>
<td>1.23</td>
<td>2.59</td>
<td>1.15</td>
<td>2.8</td>
<td>1.31</td>
<td>2.57</td>
<td>1.18</td>
</tr>
<tr>
<td>Dissatisfaction with upper body</td>
<td>2.57</td>
<td>1.14</td>
<td>2.74</td>
<td>1.27</td>
<td>2.67</td>
<td>1.18</td>
<td>2.66</td>
<td>1.23</td>
<td>2.59</td>
<td>1.15</td>
<td>2.8</td>
<td>1.31</td>
</tr>
<tr>
<td>Dissatisfaction with weight and shape</td>
<td>2.19</td>
<td>1.3</td>
<td>2.7</td>
<td>1.45</td>
<td>2.05</td>
<td>1.23</td>
<td>2.85</td>
<td>1.45</td>
<td>2.31</td>
<td>1.14</td>
<td>2.78</td>
<td>1.33</td>
</tr>
<tr>
<td>Dissatisfaction with muscles</td>
<td>2.52</td>
<td>1.2</td>
<td>2.49</td>
<td>1.24</td>
<td>2.29</td>
<td>1.17</td>
<td>2.62</td>
<td>1.23</td>
<td>2.61</td>
<td>1.04</td>
<td>2.61</td>
<td>1.13</td>
</tr>
</tbody>
</table>
Materials—The Body Change Strategies scales were comprised of Body Change Strategies to Lose Weight (4 items), Body Change Strategies to Increase Weight (4 items), and Body Change Strategies to Increase Muscles (4 items). These scales were based on the Body Change Strategies Scales developed by Ricciardelli and McCabe,20 which have been validated in 1732 Australian adolescents. Several changes were made to these scales to increase their cultural validity. These changes were based on interviews with Pacific Island adolescents that suggested that they would have difficulty in responding to some of the items. In particular, the two items in each of the original scales that related to cognitions (as opposed to behaviours) about changing body size were deleted. Cronbach’s Alpha for these scales ranged from 0.75 to 0.84.

The Body Dissatisfaction Scale was comprised of five items and was developed from modifying the Body Dissatisfaction Scale developed by Ricciardelli and McCabe.20 These items were changed based on the results of interviews with Pacific Island adolescents that indicated that these two aspects of body size were a focus for Pacific Island adolescents.18

The final Body Dissatisfaction Scale was comprised of five items and respondents indicated their level of satisfaction with their weight/shape, muscles, and specific body parts (lower, middle, upper) using a 5-point Likert scale that ranged from 1–very happy to 5–very unhappy. Cronbach’s Alpha for this scale ranged between .75 and .81. In the current study, analyses were completed using the separate items of the scale, in order to better understand dissatisfaction with different parts of the body.

Sociocultural Influences Scales were designed to assess the influence of family, church and the media on body image and body change strategies. These scales were based on the Perceived Sociocultural Influences on Body Image and Body Changes Questionnaire.22 Perceived influences from adults at school and adults at church as potential sources of messages regarding body size were included. These changes resulted from the interviews that demonstrated the importance of these two groups in shaping the body image and body change strategies of Pacific Island adolescent.23

The final three scales in the current study were comprised of nine items that assessed the levels of messages from adults at school, adults at church and the media to lose weight (three items), gain weight (three items) and increase muscles (three items)(nine items in total). Separate scales were completed for each of these three sociocultural influences. Respondents rated their answer on a 5-point Likert scale that ranged from 1–never to 5–always. Cronbach’s Alpha for these scales ranged from .70 to .73.

Procedure—Ethics approval to conduct the study was obtained from Deakin University Ethics Committee, Victorian Department of Education and the Ministry of Education in Tongan and New Zealand. In Tonga, principals from local schools were approached to provide permission for the students from their school to participate in the study. All schools that were approached agreed to participate. In New Zealand, data were collected from the Churches rather than through the schools (since Tongans only comprise a small percentage of students at school). Since the majority of Tongan adolescents attend church, it was not expected that this would result in a biased sample. Community leaders from three churches agreed to be involved in the study.

For all potential participants, information sheets and consent forms were sent home for parents to provide consent for their adolescent children to complete the questionnaire. In total, nearly all parents in both Tonga and New Zealand provided consent. In both Tonga and New Zealand, students completed the anonymous questionnaire in small well-spaced groups. The surveys took about 30 minutes to complete. All participants’ height and weight was measured individually in a private location.

Analytic strategy—Group differences in body image and body change strategies were calculated using MANOVA. Regression analyses were utilized to determine predictors of body dissatisfaction and body change strategies for each of the groups (Tongan males, Tongan females), living in either Tonga or New Zealand. The statistical package used to analyse the results was SPSS (Version 15).24

Results

More than 60% of Tongan adolescent living in New Zealand were classified as overweight or obese compared to 49% of the Tongan adolescents in Tonga, $\chi^2=79.61$, $p<.001$. More than two-thirds of Tongan females (living in Tonga and New Zealand) were
classified as overweight or obese compared to about half of Tongan males, $\chi^2=46.48$, $p<.001$.

Tongan females living in New Zealand were more likely to be classified as overweight or obese than Tongan females living in Tonga, $\chi^2=13.11$, $p<.001$. This finding also applied for Tongan males living in New Zealand compared to Tongan males living in Tonga, $\chi^2=69.06$, $p<.001$. Interestingly, sex was not related to BMI status among Tongans living in New Zealand, but among Tongans living in Tonga, females were more likely to be overweight or obese than males, $\chi^2=48.28$, $p<.001$. There were no significant differences in the responses of adolescents from different schools in Tonga, or from different church groups in New Zealand, so the data were pooled across school and church group for the analyses described below.

MANOVA demonstrated that there were main effects on body change strategies for group, $F(3, 982)=60.12$, $p<.001$, and sex, $F(3, 982)=31.02$, $p<.001$. Univariate analyses demonstrated that Tongans in Tonga were more likely than Tongans in New Zealand to engage in strategies to lose weight, $F(1, 1063)=53.03$, $p<.001$, increase weight, $F(1, 984)=112.61$, $p<.001$, and increase muscles, $F(1, 984)=144.63$, $p<.001$ (see Table 2). Univariate analyses in relation to sex effects demonstrated that males were more likely than females to engage in strategies to lose weight, $F(1, 984)=16.50$, $p<.001$, increase weight, $F(1, 984)=15.17$, $p<.01$, and increase muscles, $F(1, 984)=92.90$, $p<.001$ (see Table 2).

MANOVA demonstrated that there was a significant main effect in terms of messages about their bodies and body dissatisfaction for group, $F(9, 975)=3.01$, $p<.01$, sex, $F(9, 975)=3.40$, $p<.01$, and BMI, $F(9, 975)=3.87$, $p<.001$. Univariate analyses demonstrated that Tongans in Tonga received more messages than Tongans in New Zealand from adults at school about the desirability of having a larger weight/shape, $F(1, 983)=6.78$, $p<.01$, and having larger muscles, $F(1, 983)=19.60$, $p<.001$. They also received more messages from adults at church about the desirability of having a larger weight/shape $F(1, 983)=9.87$, $p<.01$, and about having larger muscles, $F(1, 983)=16.03$, $p<.001$ (see Table 3).

In terms of gender effects, univariate analyses demonstrated that males received more messages from adults at church to obtain larger muscles, $F(1, 983)=10.15$, $p<.001$, whereas females were more dissatisfied with their muscles, $F(1, 959)=6.39$, $p<.05$, and with their middle body, $F(1, 983)=10.62$, $p<.001$ (see Table 3 and 4). In terms of BMI, univariate analyses demonstrated that overweight participants compared to normal weight participants were more dissatisfied with their weight/shape, $F(1, 983)=27.67$, $p<.001$, muscles, $F(1, 983)=10.11$, $p<.01$, and their middle body, $F(1, 983)=7.50$, $p<.001$ (see Table 4).

In terms of media messages, there was a significant group effect, $F(3, 982)=32.68$, $p<.001$, and sex effect, $F(3, 982)=17.58$, $p<.001$. Univariate analyses demonstrated that Tongan adolescents in Tonga reported receiving more messages to lose weight ($M=8.39$, $SD=3.37$) than Tongans in New Zealand ($M=7.7$, $SD=3.23$), $F(1, 982)=13.35$, $p<.001$; increase weight ($M=7.18$, $SD=3.31$) compared to ($M=5.42$, $SD=2.51$), $F(1, 982)=86.05$, $p<.001$; and increase muscles ($M=8.28$, $SD=3.52$) compared to ($M=6.71$, $SD=2.94$), $F(1, 984)=53.13$, $p<.001$. 

NZMJ 26 November 2010, Vol 123 No 1326; ISSN 1175 8716 Page 42 of 143
URL: http://www.nzma.org.nz/journal/123-1326/4447/ ©NZMA
Gender effects indicated that females (M=8.27, SD=3.53) received more messages from the media than males (M=7.85, SD=3.05) to lose weight, F(1, 984)=5.69, p<.05; in contrast, males (M=6.94, SD=3.11), reported more messages than females (M=5.93, SD=3.04) to gain weight, F(1, 984)=19.10, p<.001; and to increase muscles: males (M=8.19, SD=3.43) versus females (M=7.06, SD=3.23), F(1, 984)=24.42, p<.001.

Regression analyses were conducted to determine the extent to which messages from adults at school, the church, media and BMI predicted strategies to lose weight, increase weight and increase muscles. Separate regressions were calculated for Tongan males in Tonga, Tongan females in Tonga, Tongan males in New Zealand, and Tongan females in New Zealand. For Tongan males in Tonga, F(4, 296)=2.25, p<.001, R²=.17. Unique variance was explained by messages from adults to lose weight, t=3.39, p<.01, β=.24. For Tongan females in Tonga, F(4, 292)=7.97, p<.001, R²=.20. Unique variance was explained by messages from adults to lose weight, t=3.39, p<.01, β=.27. For Tongan males in New Zealand, F(4, 138)=2.25, p<.001, R²=.17. Unique variance was explained by messages from the church, t=2.21, p<.01, β=.17, and the media, t=2.2, p<.05, β=.17, to lose weight. For Tongan females in New Zealand F(4, 240)=8.27, p<.001, R²=.16. Unique variance was explained by messages from adults, t=3.8, p<.001, β=.35, and the church t=2.18, p<.05, β=.15, to lose weight.

Similar results were obtained for strategies to increase weight. For Tongan males in Tonga, F(4, 296)=18.63, p<.001, R²=.24. Unique variance was explained by messages from adults at school, t=4.52, p<.001, β=.31, and the media, t .20, p<.05, β=.11, to increase weight. For Tongan females in Tonga, F(4, 292)=6.0, p<.001, R²=.09. There were no significant unique predictors. For Tongan males in New Zealand, F(4, 138)=13.34, p<.001, R²=.29. Unique variance was explained by messages from adults, t=2.01, p<.05, β=.18, and church t=2.08, p<.05, β=.16, to increase weight. For Tongan females in New Zealand, F(4, 240)=15.29, p<.001, R²=.26. Unique variance was explained by messages from adults at school, t=2.87, p<.01, β=.23, and the media, t=3.77, p<.001, β=.25, to increase weight.

Similar results were obtained for strategies to increase muscles. For Tongan males in Tonga, F(4, 296)=10.45, p<.001, R²=.15. Unique variance was explained by messages from adults at school to increase muscle, t=4.88, p<.001, β=.35. For Tongan females in Tonga, F(4, 292)=10.42, p<.001, R²=.15. Unique variance was explained by messages from adults at school, t=2.5, p<.05, β=.18, and the church, t.12, p<.05, β=.13, to increase muscles. For Tongan males in New Zealand, F(4, 138)=13.71, p<.001, R²=.29. Unique variance was explained by messages from the church to increase muscles, t=4.48, p<.001, β=.34. For Tongan females in New Zealand, F(4, 240)=21.79, p<.001, R²=.33. Unique variance was explained by messages from adults at school, t=3.46, p<.01, β=.23, and the church, t=4.81, p<.001, β=.29, to increase muscles.

**Discussion**

Consistent with previous research,6 Tongans received messages to obtain a large body; adolescents in Tonga were more likely to receive these messages than Tongan adolescents in New Zealand. This may be due to Tongan adults and adolescents in New Zealand being more exposed to Western media, and so not as strongly adopting the traditional cultural ideal of valuing a larger body.14 Once people migrate to Western societies from traditional societies they are more likely to be influenced by Western values.6 It may also be due to
the fact that Tongans in New Zealand were more likely to be overweight than Tongans in Tonga (77% as opposed to 49%).

Interestingly, females were more dissatisfied with their muscles and their middle body than males, although males were more likely than females to receive messages to obtain larger muscles. Previous research has demonstrated that Tongan males are focused on their upper body, but not on their middle and lower body.34

The large body ideal appears to apply to both males and females, but males are more satisfied with their bodies than females. This is in contrast to previous research that demonstrates that Western ideals for females are slim and lean,25 and certainly needs to be explored further in this population to determine the meaning of a large body build for females. However, consistent with past research, the media, which was primarily Western media, was reported to provide more messages to females to lose weight, whereas the messages for males were more likely to be related to gaining weight and increasing muscles.

The results of this study demonstrated that the level of overweight or obesity is extremely high among Tongan adolescents. This is particularly the case for Tongans living in New Zealand. These results are consistent with previous research,17 but extend this research to examine the prevalence of overweight and obesity among Tongans in both Tonga and New Zealand.

It was interesting to note that although females overall were more likely to be overweight or obese, this effect was primarily due to females in Tonga being twice as likely to be overweight or obese compared to Tongan males. These gender differences were not evident in New Zealand, with over 75 percent of both male and female Tongan adolescents in New Zealand being overweight or obese. Clearly, further research is necessary to determine the causes of these high levels of overweight or obesity, and the reasons for the gender differences in Tonga. It is likely that the findings relate to the types and volumes of food consumed as well as levels of physical activity.

Overweight adolescents were more dissatisfied with their bodies than normal weight adolescents. This is surprising, given the focus in Tongan society on the value of a larger body.9 However, the extremely high percentage of adolescents who were overweight or obese is likely to contribute to health risks, particularly for Tongan adolescents in New Zealand. Shoko et al.16 also found that a high percentage of Tongans in Tonga were overweight or obese.

Of concern was the finding by16 that, although this high BMI for males was not strongly correlated with fat mass, for females there was a strong correlation between fat mass and BMI. Craig et al.15 suggested that the same cut off scores for obesity should not be used for Tongan and Caucasian populations. They suggested that for adult Tongan men, the cut off for overweight and obesity should be a BMI of 27.5 and 35.8 respectively, whereas the equivalent cut offs for Tongan women should be 28.8 and 35.1. Even if these cut-off scores were changed, a large proportion of adolescents in the current sample would still be overweight or obese. Further research needs to be conducted to determine appropriate cut-off scores for overweight and obesity among Pacific Island adolescents.

Adolescents in both Tonga and New Zealand are increasingly exposed to Western media that places a high value on a slim ideal for females, and a lean muscular ideal for males.6 There is a focus among Tongans to look like film stars and celebrities.9 Perhaps this
exposure has led to changes in the type of body desired by Tongan adolescents, and so if they are overweight they evidence body dissatisfaction. These findings may also relate to the high level of publicity that has associated obesity with health problems, and so the desire by participants to lose weight, as well as increase weight and muscles.

Tongans in Tonga were more likely than Tongans in New Zealand to adopt strategies to lose weight, increase weight and increase muscles. It would appear that Tongans in Tonga still want to maintain a large body size that is valued within their society, but also lose weight because of messages from the media about a healthier body size. Although it appears contradictory for adolescents to be adopting all three of these body change strategies, it is possible that they want to build up their muscles, but reduce body fat: these adolescents appear to be striving for a leaner, muscular body, with lower levels of body fat. This is more likely to be the goal of males, since they were more likely than females to engage in the three body change strategies, and so be attempting to both lose weight and increase muscle tone.

The main predictors of all of the body change strategies were messages from adults, and to a lesser extent from the church, for the adolescents to change their bodies. This applied for both males and females, in both countries. Thus it would appear for these adolescents that the family and church, but not the media, were more likely to predict the body change strategies they adopted.

The results from this study need to be explored further in future research to determine the extent to which Tongans in both countries are still influenced by the cultural ideal of a large body, and so how this ideal is shaping the body image and body changes strategies of adolescent in both countries. Further sources of information about the sociocultural messages received by Tongans from both countries need to be investigated. For example, the influence of the peer group on messages to lose weight and increase muscles needs to be investigated.

The motivation of Tongans in both countries to adopt the various strategies to change their body size and shape also needs to be explored to determine the extent to which these body change strategies are motivated by health, as opposed to striving for the Western ideal of a slim, toned body.

Competing interests: None.

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References:


Improving school readiness with the Before School Check: early experience in Hawke’s Bay

Russell Wills, Kay Morris Matthews, Cath Hedley, Trish Freer, Helen Morris

Abstract

Aim The New Zealand Ministry of Health’s Before-School Check (B4SC) aims to identify those 4-year-old children with health, developmental or behavioural problems likely to impact on their education so these can be remediated before school entry. This evaluation aims to demonstrate the outcomes of the first 10 months of the B4SC programme in Hawke’s Bay and the lessons learnt.

Methods The B4SC was implemented in Hawke’s Bay using an intersectoral, collaborative approach including all major stakeholders, led by the Hawke’s Bay Primary Health Organisation (HBPHO). Local clinical practice and referral processes were established by a Clinical Advisory Group. Eighty-four practice nurses, Well Child/Tamariki Ora nurses and independent practitioners have been trained in group and individual settings. All referrals come through a clinical nurse leader to an intersectoral triage group.

Results In the 10 months since the first training the nurses have assessed 1848 out of 2180 or 84% of the cohort, including 75% of children in quintile 5. Referrals average 55% and have been of high quality with 74% accepted, 14% already known, and only 8% declined at triage.

Conclusion The intersectoral Clinical Advisory Group has been critical to the success of the programme, as it has achieved engagement and commitment from all stakeholders to the clinical processes and referral pathways. Training nurses with existing community health skills, relationships with families and strong community networks has led to high rates of children seen from the most deprived quintile. The training and the referral pathway, via the Clinical Nurse Leader to an intersectoral triage group, have led to high quality referrals and a low rate of referrals declined.

School readiness is a complex construct including cognitive, social and emotional skills, a family’s willingness and ability to support a child’s pre-school education and a school’s readiness for the children. There are wide ethnic and socioeconomic gaps in achievement apparent at school entry in the US, Canada, Australia and New Zealand. These differences matter because they predict later achievement.

Interventions in later childhood or adulthood produce mixed results and are labour and resource intensive. In contrast, there is a growing evidence base of effective interventions for younger children with developmental and behavioural difficulties, including in New Zealand.

The Minister of Health launched the Before-School Check (B4SC) in February 2008. Its purpose is to “identify and address any health, behavioural, social, or
developmental concerns which could affect a child's ability to get the most benefit from school…”. 19

The B4SC includes a child health questionnaire,20 vision and hearing screening (sweep audiometry, tympanometry and distance visual acuity), height and weight, assessment of behaviour with the Strengths and Difficulties Questionnaire21 (SDQ) and development with the Parent Evaluation of Developmental Status22 (PEDS), oral health screen, health promotion and education and referrals as indicated. 23 In Hawke’s Bay the Ages and Stages Questionnaire24 is used as a second-stage screen for development if there is one significant concern on the PEDS or parental communication difficulties. On time immunisation is promoted and opportunistic immunisations provided where indicated.

The B4SC was piloted in Counties Manukau and Whanganui District Health Boards between August and November 2007 and then evaluated.25 Parents reported high levels of confidence and satisfaction in the programme and said they would recommend it to others. A number of recommendations were made, which were noted in the design of the B4SC programme in Hawke’s Bay.

The Hawke’s Bay District Health Board (HBDHB) services a largely rural population on the East Coast of New Zealand. In 2006 there were 34,101 children and 18,210 young people residing in the region26 and there are approximately 2,200 deliveries a year. The preschool population of Hawke’s Bay is more deprived than that of New Zealand (NZ), with 56% of babies born in NZ Deprivation Index deciles (NZDep) 8–10 in 2006, compared to 39% in NZ. In 2006, the proportion of young people 15 years and over with little or no formal attainment on leaving school was 40% compared with a national average of 31%. 27

Methods

The Hawke’s Bay District Health Board (HBDHB) used a formal tender process to choose a provider for the B4SC. The tender was won by the Hawke’s Bay Primary Health Organisation (HBPHO), whose proposal emphasized collaboration between providers, registered nurses with well child experience and maximizing the potential of established relationships with families.

In December a Clinical Advisory Group (CAG) was formed, chaired by a Clinical Director of Paediatrics at HBDHB. The CAG meets quarterly and includes clinical leaders or managers from HBPHO: HBDHB Paediatrics, Child Development Unit (CDU), Child, Adolescent and Family Service (CAFS), Oral Health Service, Planning, Funding and Performance and Healthy Populations Team; non-governmental (NGO) social services; Eastern Institute of Technology (EIT) educationalists and Ministry of Education Regional Office and Group Special Education (MOE:SE). The decision was taken to defer implementation until the CAG was satisfied that all the necessary systems and processes were in place. Ten workstreams were formed reporting to the CAG to recommend processes suitable to the local environment. These were agreed to by the CAG in January 2009.

All referrals come through the B4SC Clinical Nurse Leader to a triage group of senior clinicians from Paediatrics, CDU, CAFS, NGO social services and MOE:SE. This group meets fortnightly and agrees which service referrals will be sent to or whether further information is required. As MOE:SE and CAFS have long waiting lists, referrals for behaviour are sent to NGOs for support until appointments at the secondary services are available.

A 3-day workforce development programme was designed and delivered by an intersectoral group including paediatrician, nurses, public health, Plunket and education academicians. The training was based on a train-the-trainer programme designed by Plunket and modified for use in Hawke’s Bay. Content included the epidemiology of preschool childhood illness, long term consequences of the conditions screened for in the B4SC, introduction to health promotion and the Well Child/ Tamariki Ora Schedule, the content of the check, referral processes and the evaluation.
Training was promoted to all three PHOs in Hawke’s Bay. Māori and independent providers, Plunket and General Practice nurses were encouraged to attend. The first cohort of 41 nurses completed training in February and the programme began in March 2009. Of the 41, 23 were general practice nurses, 11 were Well Child/Tamariki Ora nurses and 7 were independent practitioners from Public Health, general practice and Tamariki Ora nursing backgrounds. A second group training was provided in August in response to demand. In total, 84 B4SC nurses have been trained to date.

Personal approaches were made to Kohanga Reo, kindergartens and other early childhood education services and organisations. Evening and afternoon information meetings for early childhood teachers were held. Nationally and locally-written information was distributed through mailouts. Public health nurses and vision and hearing technicians actively promoted the programme during regular visits to early childhood education centres and Kohanga Reo.

Data collection was initially on paper and has become increasingly electronic over time as resources and time allowed, e.g. using a MedTech32 advance form. The data is manually re-entered from the HBPHO database into the Ministry of Health B4SC database on the MOH website. Data was exported from the website into an Excel spreadsheet designed specifically for B4SC by HBPHO staff. Data cleaning was required on the data retrieved into the Excel spreadsheet. Analysis was performed in Excel.

Feedback on training was graded on a 5-point Likert scale from very poor to very good and narrative responses were also sought. Demographic data, volumes of checks completed, referrals and referrals declined were collected. New Zealand Deprivation Index quintile was recorded for all children from the HBPHO database.

Results

The first two trainings went over three and 2 days in February and August 2009 respectively. Each day of training was evaluated by 6-11 questions depending on content, and each question answered by 14–29 respondents. From the two nurse trainings 776 survey questions were answered, of which 673 (88%) responses were 4 or 5/5 (good or very good). Narrative responses were overwhelmingly positive and the few constructive criticisms informed the second session, e.g., shortening the programme and specific feedback to individual presenters.

Following training in February, volumes of checks rapidly increased to peak at 333 in May and have steadily fallen since (Figure 1).

![Fig 1. Hawke’s Bay B4SC checks and referrals Sept 2008 - Dec 2009](http://www.nzma.org.nz/journal/123-1326/4434/)
A total of 1848 checks (84% of the cohort) had been completed in the 10 months between March 2009 and January 7th 2010 (Table 1). After a settling-in period, the referral rate has remained constant at around 50%.

Table 1. Children seen by quintile to 7 January 2010

<table>
<thead>
<tr>
<th>Quintile</th>
<th>Births</th>
<th>B4SC done</th>
<th>% of cohort</th>
<th>% of all checks</th>
<th>% of quintile checked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q5/Q0</td>
<td>790</td>
<td>593</td>
<td>36%</td>
<td>32%</td>
<td>75%</td>
</tr>
<tr>
<td>Q4</td>
<td>449</td>
<td>358</td>
<td>21%</td>
<td>19%</td>
<td>80%</td>
</tr>
<tr>
<td>Q3</td>
<td>411</td>
<td>368</td>
<td>19%</td>
<td>20%</td>
<td>90%</td>
</tr>
<tr>
<td>Q2</td>
<td>269</td>
<td>241</td>
<td>12%</td>
<td>13%</td>
<td>90%</td>
</tr>
<tr>
<td>Q1</td>
<td>261</td>
<td>288</td>
<td>12%</td>
<td>16%</td>
<td>110%</td>
</tr>
<tr>
<td>Total</td>
<td>2180</td>
<td>1848</td>
<td></td>
<td></td>
<td>84%</td>
</tr>
</tbody>
</table>

Each year the number of children who receive checks may exceed the number in the MOH database because of immigration into the area and children just turned 5 whose parents request a check or who are finally found and receive a check. Children in Quintile 1 are more likely to not require a referral so checks are registered as “completed” earlier than children in other quintiles. The number of children in Quintile 1 whose checks are completed is therefore more likely to exceed the number in the database than other quintiles. No child received the B4SC more than once.

The proportion of children assessed in each quintile over time was examined in consecutive groups of 100 (Figure 2). The proportion in Quintile 5 has varied between 25–40%.
Overall, despite considerable effort to recruit children in Quintile 5, there remains a clear gradient of recruitment between Quintiles 1–5 (Figure 3).

Referrals were examined by issue (Figures 4 and 5). Dental (24% of referrals, 14% of children), hearing (21%, 12%) and vision (20%, 11%) were the most common issues requiring referral. Most dental referrals were for non-enrolment, but significant numbers of children with severe caries were identified and referred. Integration of the Oral Health Service and B4SC databases greatly reduced unnecessary referrals.

Most referrals for hearing were for glue ear. Referrals for developmental concerns (PEDS 13% of referrals, 7% of children) were greater than for behaviour (SDQ 5%, 3%). Narrative feedback from nurses and the triage group however suggests that the SDQ referrals under-represent actual numbers with behaviour concerns, because many children with behaviour concerns are identified via the PEDS.

The breakdown of referrals by type and deprivation quintile is shown in Figure 6. There was a clear gradient of increasing referrals by quintile, with children in Quintile 5 having the highest referral rate. The gradient effect was seen for all referrals.

Overall, 74% of referrals were accepted (Figure 7). Referrals were declined at triage for 8% and only 2% of parents declined referral, giving a yield of $(1024 \times 0.74)/1848 = 41\%$. 
Fig 4. Referrals by issue as % of all referrals

Fig 5. Referrals by issue as % of children referred for that issue
Fig 6. B4SC referrals by type and quintile to 7 Jan 2010

Fig 7. Outcome of referrals 16/3/09-22/01/2010
The three NGOs receiving the majority of the B4SC referrals for social work, counselling or parenting programmes reported accelerated demand that exceeded the resources available. Some have had to reduce service to client groups who have previously received service. Even so, NGOs prioritised B4SC referrals and all reported 60-70% attendance rates upon referral.28

The impact of referrals to Ministry of Education: Special Education has meant that waiting lists for children to be seen by Special Education have increased from 2 to 3 months.29 The Child Development Unit (CDU) also reported a significant workload increase where, as a result of texting parents to remind them of appointment times and locations, they achieved 100% attendance rate to date.30 Senior staff from the non-governmental organisations, Special Education and CDU who are also members of the B4SC Triage Team reported that the preparation required for Triage plus its regular meeting times added another 6-8 hours to their respective fortnightly workloads.31

The volumes of referrals to Vision Hearing Testers (VHTs) from the B4SC have placed an additional administrative load on this service, particularly given the data entry requirements. The number of referrals has resulted in waiting lists of 3 to 8 weeks. TXT2Remind has ensured low non-attendance rates in this service.

The referrals to Dental Therapists from the B4SC have placed the service under pressure due to large numbers of children referred from the B4SC with severe caries and an increased administrative workload.

In Hawke’s Bay, immunisation levels at 2 years are among the highest nationally at 91%. Nurses report many opportunistic vaccinations of 4-year-olds and other family members by general practitioners and independent nurse practitioners in homes.32 Nurses also report a greater understanding of child development and behaviour, family issues and services in the community for families in need.

**Box**

Sandy* was home visited by an independent practitioner after failing to attend B4SC clinic appointments. Her children were 4 years 11 months, 2 years and 8 weeks. She had separated from her husband recently. She reported that he continued to visit when he wished with no warning, undermined her parenting and failed to keep promises to the children. She reported symptoms of moderate depression. She was breastfeeding the 2 year-old and the baby, as she lacked the energy to wean the toddler. The 4-year-old had severe behavior disturbance, scoring 15 on the SDQ and 6/6 for conduct, and repeatedly stated that, “Dad moved out because he doesn’t love me any more”. Referrals were made to Plunket to wean the baby, the general practitioner for treatment of depression and to an NGO for social support and including placing boundaries on the ex-husband’s behaviour. Referral to counselling for him was offered but declined. A public health nurse supported transition to school. The mother’s depression lifted, the son’s behaviour improved, transition to school went well and while the ex-husband continues to be unsupportive, the mother reports feeling well-supported by the school and NGO.

*Details changed to protect identities.
Discussion

Ten months after the first nurse training, the B4SC in Hawke’s Bay is beginning to demonstrate some of the outcomes we had hoped for. Seventy-five percent of children in Quintile 5 and 84% of the total cohort have been assessed. There remains a gradient of recruitment from Quintile 1 to 5 despite considerable effort to recruit from the poorest quintiles. This is consistent with the experience of the pilots,\(^{25}\) where considerable extra effort was required to recruit low-decile families.

Referrals are stable at 55%, higher than the 31% referral rate of the pilots,\(^{25}\) but this includes high numbers of children referred simply for enrolment in the oral health service. It is pleasing to see the clear gradient of increasing referrals with deprivation and the low decline rate. Narrative feedback from the triage group suggests referrals are appropriate and of a high standard.

The very low rate of parents declining assessment is encouraging. The referral rate of 7% of children for development appears reasonable. The apparently low referral rate for behaviour of 3% is approximately half of that expected, but could be explained by some referrals for behaviour from the PEDS, which is administered first in Hawke’s Bay. Narrative feedback from nurses suggests some resistance to the SDQ from parents and nurses, however it appears to be gaining acceptance as nurses become more confident in its use.

The referrals have increased the workload for referral services, none of which have had increased resources to cope with the additional workload, but they have prioritised B4SC referrals. Over time this may mean that some services change their skill mix to manage the higher-complexity families referred from the B4SC programme. Managing expectations will also become increasingly important to services and funders as families with more straightforward problems used to receiving a service can no longer receive it.

We have also identified a need for services in remote settings, such as the Chatham Islands, Central Hawke’s Bay and Wairoa, where there are currently limited or no NGO social services or secondary behaviour services. Discussions to meet the identified need are underway.

While considerable work has been done to engage early childhood education and Te Kohanga Reo, there remains skepticism about the SDQ in particular and engagement remains patchy. The CAG’s view is that this skepticism will be addressed most effectively by parents’ and teachers’ successful experiences and ongoing feedback of programme outcomes.

Clinical governance from the CAG worked well. The CAG agreed local clinical and referral processes quickly and proved an effective forum to address issues as they arose. The triage process, with referrals funneled through the clinical nurse leader to an intersectoral group of senior clinical leaders, is time consuming but has led to very few inappropriate referrals or referrals declined and has contributed to the impact on services being manageable.
In our view this has been an appropriate use of these clinicians’ time. Narrative feedback from nurses suggests that long waits for secondary services and poor coordination when multiple appointments are needed continue to act as a barrier to access to services for poor families. Long waits also mean interventions may not be completed by school entry.

Practice nurses and Well Child/ Tamariki Ora nurses self-selected for training and have gained the necessary skills quickly. Their existing relationships with families proved helpful, though many said they learnt new things about families they had thought they knew well. Hard-to-reach families were often engaged by independent practitioners, who proved very effective at finding mobile families using their extensive community networks.

On their home visits they have identified a wide variety of previously unmet needs including food poverty, lack of heating, crowding, parental mental illness, family violence, unimmunized children and dental caries, for which referrals were made. These disparate outcomes, while tangible and important to families, are difficult to capture in quantitative reporting and cost-benefit analysis (see Box).

Early referrals were variable in quality and under-referral was noted for Quintile 5 families and for behaviour and developmental concerns. The multiagency triage process and a trusted, senior nurse leader to discuss the referrals with were time-consuming, but proved effective strategies to increase nurse confidence, the quality of assessments and referrals, and referral numbers. In our view these were key to the success of the programme.

Few parents when phoned by the referral services have declined support. Those that did were referred back to the practice nurse, who has often been able to persuade families to engage.

A mixed-method research programme evaluating the B4SC in Hawke’s Bay is underway with a first report due in July 2010. Funded by the Hawke’s Bay Children’s Holdings Trust it will include an analysis of the outcomes of the programme as it develops and the experiences of nurses and parents. A longitudinal study of up to 100 children referred with high scores on the SDQ will report in June 2011.

**Competing interests:** None.

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References:


30. Interviews with senior staff of Hawke’s Bay NGOs, 27 October, 2 November 2009 conducted by EIT-Hawke’s Bay researchers.

31. Interview with Hawke’s Bay B4SC Triage Team 2 November 2009 conducted by EIT-Hawke’s Bay researchers.

32. Ibid.

33. Ibid.


35. Interview with senior staff member, Immunisation, 3 November 2009.

Gestational diabetes mellitus in Tonga: insights from healthcare professionals and women who experienced gestational diabetes mellitus

Frances Doran, Kierrynn Davis

Abstract

Aim To gain contextual insights from Tongan healthcare professionals and women who had developed gestational diabetes mellitus (GDM).

Method Qualitative, individual, semi-structured, face-to-face interviews were conducted during 2006 with 11 women who had developed GDM in the previous 12 months and 10 health professionals who worked in the GDM/diabetes area in Tonga.

Results Due to funding issues glucose supplies were often scarce which precluded universal screening. GDM management which focused on encouraging behavioural change to diet and physical activity were reported to be effective in managing GDM in Tonga. Changes to physical activity levels were difficult because of ‘laziness’ (the participant’s words). Preventative screening was perceived to be a foreign idea in Tonga which negatively influenced post-partum screening and monitoring.

Conclusion GDM was reportedly well-managed through lifestyle interventions. ‘Laziness’, identified as a contributing factor to obesity and physical inactivity needs to be considered within a broader context of complex social and economic changes in Tonga. There are clear challenges to shift attitudes towards preventative screening in Tonga and for screening supplies to be adequately funded. Lifestyle intervention targeted towards modifiable risk factors of obesity and physical activity for GDM and Type 2 diabetes need to extend into the postpartum period.

Diabetes, including GDM is a significant and increasing global public health issue in the Asia-Pacific region. The overall rate of diabetes in Tonga is 15.1% which has doubled in the last 25 years.

Women from the Pacific Islands are a known high risk group for diabetes with reported incidence rates of GDM around 20%. Women who develop GDM have an increased risk of developing GDM in subsequent pregnancies and many women who have had GDM will go on to develop Type 2 diabetes later in life.

Yet, research into GDM in Tonga is virtually non-existent. This qualitative study explored GDM in Tonga, through interviews, with women who experienced GDM and health professionals who worked in the GDM/diabetes area.

The research was undertaken in Nuku’alofa, the capital of Tonga, in May/June 2006. Ethics approval was granted from the Tongan Ministry of Health and Southern Cross University, NSW, Australia.
Methods

The researcher worked closely with a Tongan counterpart; a senior medical officer who worked at Vaiola Hospital, the main hospital in Tonga on research design and implementation.

Participant recruitment—A purposive sampling method was used by the counterpart who recruited all participants. Thirty women who had experienced GDM in the previous 12 months, who had their baby at the main hospital in Tonga were contacted by phone and the study explained. Eleven women agreed to be interviewed by the researcher at the hospital and travel costs were reimbursed. Three women were not contactable despite several attempts and messages left. Although not explicitly determined, the counterpart suggested reasons for non-participation of 16 women related to difficulties travelling to the hospital; other commitments or reluctance to participate in research conducted by a palangi (foreigner).

The health professionals worked in the area of GDM/diabetes within the Ministry of Health. Most worked at the main hospital in either the diabetes clinic, maternity ward, ante-natal clinic or obstetrics and gynaecology. One health professional worked at a local village health centre. All health professionals contacted by the counterpart agreed to be interviewed.

Interview rationale and techniques—Following discussion with the Tongan counterpart, a verbal interview was deliberately chosen as the most appropriate qualitative data collection method for all participants based on its suitability and potential to obtain a detailed picture of how people experience their world. Although schooling in Tonga is conducted in English it was suggested by the counterpart that some women’s reading and writing skills may not be as proficient as conversational English. Therefore, a written survey was deliberately not used.

Interviews with all participants were face-to-face, in-depth, individual and semi-structured. Interviews were tape-recorded, transcribed and analysed for key themes by the researcher. All participants provided written informed consent to be interviewed. The consent forms (the ‘Savea Suka Feitama’) were written in the Tongan language.

Interview objectives—The objectives of the interviews with women who experienced GDM were to explore if, and how, a diagnosis of GDM influenced behaviour change, particularly in relation to diet and physical activity; any concerning/motivating factors that influenced change and insights into what was needed to support sustained change. The objectives of the interviews with the health professionals were to explore the screening, management and follow-up of GDM; whether GDM was seen as a warning signal for the prevention of Type 2 diabetes and key GDM issues regarding weight, diet and physical activity.

Interview questions—Guiding questions were developed to enable an exploration of the topic in line with the research objectives. These questions ensured the interviews were focused but also allowed for conversation. (See Tables 1 & 2)

Table 1. Women who experienced GDM interview guide

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have a family history of GDM? Relationship?</td>
</tr>
<tr>
<td>If you were concerned, what were you mainly concerned about a diagnosis of GDM?</td>
</tr>
<tr>
<td>After the diagnosis of GDM what information were you given about GDM?</td>
</tr>
<tr>
<td>Were you given any information about physical activity in relation to GDM? If so, what was the advice?</td>
</tr>
<tr>
<td>Did the diagnosis of GDM influence you to change your physical activity levels at all?</td>
</tr>
<tr>
<td>What helped you engage in physical activity during your pregnancy and after the baby was born?</td>
</tr>
<tr>
<td>What are some of the barriers to you doing physical activity during pregnancy and after the baby was born?</td>
</tr>
<tr>
<td>Are there any particular things for Tongan women that you think influence exercise / physical activity levels during pregnancy?</td>
</tr>
<tr>
<td>Do you think Type 2 diabetes is a significant health issue for Tongan people generally?</td>
</tr>
<tr>
<td>What do you think is needed to prevent diabetes/ GDM?</td>
</tr>
</tbody>
</table>
The interview with GDM participants began with questions concerning age, number of pregnancies, and family history of Type 2 diabetes. The interview with the healthcare professionals began with questions about their profession and work in relation to GDM and/or Type 2 diabetes.

Table 2. Health professional’s interview guide

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is your understanding of a woman's risk of developing gestational diabetes?</td>
</tr>
<tr>
<td>Can you tell me about the general screening and diagnostic tools that are used?</td>
</tr>
<tr>
<td>What is your usual treatment/management of gestational diabetes?</td>
</tr>
<tr>
<td>What are your views about exercise/physical activity in terms of the management/prevention of gestational diabetes?</td>
</tr>
<tr>
<td>What recommendations (if any) would you make to women with a recent diagnosis of GDM?</td>
</tr>
<tr>
<td>In what ways do you think culture may influence women during pregnancy in terms of general lifestyle and behaviour factors?</td>
</tr>
<tr>
<td>What do you consider to be the barriers to pregnant women and women generally engaging in physical activity?</td>
</tr>
<tr>
<td>What are your thoughts on the significance of GDM and Type 2 diabetes in Tonga?</td>
</tr>
</tbody>
</table>

Results

Individual face-to-face interviews were conducted with eleven women who had experienced GDM in the previous 12 months and ten health professionals. Interviews with GDM participants ranged from 20 to 40 minutes and with health professionals 40 to 60 minutes.

The average age of women interviewed who had GDM was 34 years (24-40 yrs). Seven of the eleven women had a family history of diabetes and two women had a family history of GDM. Although BMI was not ascertained, all women were overweight.

Doctors, registered nurses/midwives and a dietitian were interviewed. Those who work within the Ministry of Health, particularly in the GDM, diabetes area and obstetrics and gynaecology areas are relatively few in number. Therefore, in order to avoid identification of any particular health professional and to ensure confidentiality, the results of interviews with the health professional are presented generally as themes, developed according to commonality.

Interviews with women who had developed GDM

Ways the diagnosis of GDM influenced behaviour change (specifically regarding diet and physical activity)—All women were influenced by education and an increased awareness of the need for some kind of behaviour change as a result of a diagnosis of GDM. ‘Not doing enough exercise and too much eating is why I put on weight and got GDM’.

Recommendations for dietary change were mentioned by all women. Women reported being advised to eat more fruit and vegetables, eat more fish and ‘pulu’ (cow) and less ‘buaka’ (pork); drink water and not soft drinks; reduce their intake of sugar, fat and
starch and to eat smaller meals, particularly at night. Some women were advised to lose weight. Women were advised to become more physically active; mainly to walk. Difficulties with behaviour change were a common theme for all women; ‘it was hard to change but I tried not to eat so much fat or sugar’. Not all reported becoming more active and two women specifically said they did not make any changes to physical activity levels.

**Concerning or motivating factors that influenced any changes to diet or physical activity**—Adopting more healthy behaviours during pregnancy was generally motivated by concerns for the health of the baby. Fear of a caesarean was a concern; ‘scared that if the sugar was too high they would take the baby out’.

Fear of developing diabetes was reported a motivating factor for change. One woman was fearful that if she kept eating ‘buaka’ (pork) she would develop diabetes. Another woman commented on a woman in her village that ‘had her foot cut off because of diabetes’.

Laziness [the women’s words] was perceived by all women to negatively influence changes to physical activity; ‘it’s hard for the lazy people but not hard for the people afraid of death’. An awareness of the benefits of the recommended changes was a theme; ‘exercise makes you feel healthier’.

**Perceived ways to support sustained change**—In terms of GDM prevention, a common theme was that doctors and nurses should provide lifestyle education to women before marriage and pregnancy on ways to prevent GDM and Type 2 diabetes. Educational programs from the Ministry of Health; ‘to let people know if they don’t do this then they get that’, were viewed as effective ways to support sustained change.

No comments were made about follow-up support or screening.

**Interviews with healthcare professionals**

**A consideration of the key screening, management and follow-up issues in relation to GDM**—Screening was viewed as essentially a very cost-effective package for the ‘national battle against diabetes’ and important ‘not only for its obstetric value but as a predictive factor for the future.’ At-risk’ women were advised of lifestyle changes to weight, diet and physical activity that could delay or prevent the onset of permanent diabetes. Cost-effectiveness in managing GDM was reported with clear evidence in Tonga that diet-control to manage GDM, does make a difference because few women required insulin. GDM management included education on the increased risk of developing diabetes; the silent nature of the disease and the need for follow-up screening.

Even though universal screening via an oral glucose tolerance test (OGTT) was recommended practice in Tonga, it did not always happen. Glucose supplies were not part of the Tongan Ministry of Health’s budget but were funded by the World Health Organization (WHO) which had an office in Tonga. Supplies often ran low which necessitated selective screening. This was viewed as a major problem as most Tongan women had modifiable risk factors for GDM (especially overweight); the criteria used to selectively screen women at risk.
Problems related to lack of follow-up screening for both Type 2 diabetes and GDM emerged as a common theme. Most women post partum GDM reportedly do not attend for follow-up screening appointments. Likewise, many Tongan people presented to the clinics with advanced stages of diabetes, despite a variety of strategies that were in place to remind people to turn up for their appointments. ‘Screening is a foreign idea for most Tongans—they have the idea that if you are well you do not need to go…. [to the health service]…you only go if you are sick’.

Considerations of GDM as a significant “warning signal” for the prevention of Type 2 diabetes—Because of the high prevalence of diabetes in Tonga, most women were thought to be already very aware of the disease; to know someone, or care for someone with diabetes at home. All health professionals viewed diabetes as the most significant health problem in Tonga yet did not think GDM was a significant warning signal for women for developing future diabetes.

Key issues regarding weight, diet and physical activity—Weight gain in the first pregnancy was seen as a serious issue for pregnant women; weight not lost between pregnancies, coupled with idleness, contributes to obesity which increases the risk of another GDM pregnancy and future Type 2 diabetes. Because of high rates of obesity in Tonga, ante-natal advice provided women with GDM was often to start being active during pregnancy and to lose weight when they become pregnant; which reportedly was in contrast to ante-natal guidelines in other countries.

Laziness was identified as a contributing factor to high levels of overweight, poor diet and lack of physical activity in Tonga; ‘too much sitting around, doing nothing and eating’. Health professionals referred to the changes in Tonga over the last twenty years such as more cars; more unhealthy take-away food options and less eating and cooking of healthy traditional foods. ‘No-one walks now—lots of people have cars and they even drive to church and around the corner.’

Current health promotion programmes on the radio that focused on nutrition and physical activity and exercise programmes supported by the Tongan Ministry of Health were seen as effective tools for delivering messages on healthy weight, healthy eating and the importance of being physically active.

Discussion

The purpose of this qualitative study was exploratory and the findings are only applicable to the study participants. The interviews enabled contextual insights into GDM and diabetes in Tonga and this subjectivity is integral to meaningful qualitative data. Even though the women with GDM could speak English, a translator may have facilitated deeper responses and encouraged more women to participate in interviews.

Most women in this study had common risk factors for GDM: a relative with Type 2 diabetes (many first degree relatives); age over 35 years; overweight and belonging to a high-risk population. Obesity and physical inactivity are particularly prevalent risk factors for Tongan women.

Screening via an oral glucose tolerance test for GDM was seen by the health professionals as a cost-effective strategy but lack of funding for supplies precluded universal screening in Tonga. Financial commitment to enable universal screening is a
cost-effective investment and relatively easy way to identify and target women who have a substantial risk of developing Type 2 diabetes in Tonga.

Preventative screening was reported to be a foreign idea to Tongan people and ongoing monitoring in the post-partum period was basically non-existent. As stated by Colagiuri et al the high rate of undiagnosed Type 2 diabetes most likely reflects a lack of available routine medical services in Tonga; a lack of community awareness of diabetes and the 'prevailing attitude of seeking medical advice only for advanced problems'. Women would clearly benefit from a greater awareness of glycaemic symptoms to allow early self-referral with education that diabetes frequently occurs in the absence of symptoms, hence the importance of regular blood glucose checks.

Following a diagnosis of GDM women’s major concerns were for the baby. Adverse delivery outcomes and perinatal morbidity are supported by evidence of the risks involved for mother and baby with a pregnancy complicated by GDM. It was not clear from this research if and how these or any other concerns specifically influenced behaviour change.

Changes to Tongan culture and influences brought about by increasing westernisation, globalisation, urbanisation and economic factors have negatively impacted on diet, physical activity and obesity in Tonga. Complex social and economic change has contributed to reduced physical activity, changes in manual employment and an increase in the availability of high-fat, energy foods. Since the mid-90’s imported foods which are relatively expensive compared to traditional foods are eaten more and have contributed to high rates of obesity in Tonga. 'Laziness’ was seen to contribute to obesity and physical inactivity. Increased urbanisation contributes to decreased levels of physical activity and higher rates of obesity in Tonga, despite the fact that many residents continue to have some rural component to their lives.

Obesity, particularly triggered by weight gain during the first pregnancy was reported to be a significant risk factor for GDM and diabetes. Preventing obesity in young women combined with interventions on effective nutrition and physical activity that produce weight loss, targeted at women who develop GDM are needed to postpone or prevent the development of Type 2 diabetes. Lifestyle interventions have been shown to delay or prevent the development of diabetes particularly in overweight women.

Whilst GDM was reported to be effectively managed in Tonga through lifestyle education and diet-control, sustained compliance to lifestyle changes will only be achieved if women understand the potential benefits to be gained through changes to diet and physical activity levels. Tonga has its own particular deterrents and barriers to physical activity and good nutrition. McCarty and Zimmet maintain the ‘promotion of healthy lifestyles, while respecting local culture, poses an enormous challenge but it is essential to optimize health for all Pacific Islanders.’ Participants commented positively on broader public health programmes in Tonga that delivered healthy lifestyle messages. Preventing chronic diseases including Type 2 diabetes and obesity is on the political, economic and health agenda of the Tongan Ministry of Health. Diabetes was identified as the main public health issue in Tonga for all participants. Given that complications associated with diabetes, particularly severe diabetic foot damage are common in Tonga it was understandable
that fear of developing diabetes including amputation was mentioned as a concern in the interviews with GDM participants. GDM, however, was not seen as a warning signal for the development of Type 2 diabetes in Tonga.

Conclusion

The results of this exploratory research provide some insight into the complexity of issues related to GDM and Type 2 diabetes in Tonga. Even though there was evidence of the effectiveness of lifestyle recommendations to manage GDM, there is a challenge in Tonga to support women who experience GDM to minimise their risk of developing future diabetes which needs to extend to the postpartum period.14

Ongoing education on the symptoms of diabetes and the importance of screening even when there are no apparent symptoms of diabetes is needed20 to raise awareness of the significant risk women who experience GDM have of developing Type 2 diabetes. Financial commitment is needed to ensure all women in Tonga are screened for GDM.

There are clear implications for lifestyle intervention targeted towards reducing obesity and encouraging physical activity of women in Tonga, both during pregnancy and in the postpartum period to curb the incidence of GDM and Type 2 diabetes for this high risk group of women. A further in-depth study of this type by a Tongan researcher would provide needed insight on screening and comprehensive care to this group of women.

Competing interests: None.

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References:


Māori challenges and crown responsibilities: Māori policymaker ideas on smokefree policy options

Heather Gifford, Kiri Parata, George Thomson

Abstract

Aim To determine obstacles/opportunities within policy processes, for smokefree interventions appropriate to Māori. In particular, to explore Māori policymakers’ ideas on how to achieve progress on smokefree homes, cars and community property.

Methods Documents and interviews with 16 senior Māori officials and Members of Parliament, and nine interviews in two case studies, were used to explore Māori policymakers’ ideas for (i) Progress, within relevant policy processes, on smoking in homes, cars and community property; (ii) Particular interventions that the interviewees felt were most and least effective, practical, sustainable, politically feasible or desirable in some way; (iii) The context, and obstacles and opportunities for such interventions. The case studies were of a Māori health service and a group of Māori District Health Board managers.

Results Several key themes emerged from the research including, (i) children as drivers for change, (ii) strong national and local indigenous leadership needed for change, (iii) delivering smokefree messages as part of wider healthy living approaches, (iv) targeting of the messages for greatest impact for Māori, (v) need for a Māori approach, not a general approach, (vi) central and local government having a significant role in the prevention of tobacco harm, (vii) ideas on how tobacco tax revenue should be spent on tobacco control, and (viii) the rights of children to smokefree environments.

Conclusions Results indicate that indigenous specific approaches and indigenous leadership are critical for Māori tobacco-free advances. Harnessing indigenous values and principles related to health, family and children was the preferred method of these Māori policymakers for delivering social marketing messages.

Smoking in homes is a crucial factor in starting smoking and quitting.\(^1\)\(^-\)\(^5\) For New Zealand youth, the relative risk of Māori children reporting smoking inside their homes has been increasing.\(^6\) Substantial immediate gains in preventable mortality and morbidity are possible by reducing exposure to secondhand smoke (SHS) in homes and cars, particularly from the reduction of the exposure to children.\(^7\)\(^-\)\(^11\) There is clear evidence of higher exposure to SHS in homes and cars for Māori children.\(^6,12\)

When Year 10 students were asked in 2008 if there was smoking in their homes, 36% of Māori students reported smoking in the home, compared to 18% for European/other students.\(^6\) These figures had decreased significantly since 2001, when 48% of Māori students reported smoking in the home, compared to 27% for European/other students. Exposure may be compounded for Māori by over representation in low socioeconomic groupings; for students in the three most
socioeconomically deprived deciles of schools in 2008, 31% reported smoking in the home.\(^6\)

Māori children are also exposed to SHS in cars at a higher rate. When asked in 2006 if someone had smoked while they were travelling in cars or vans in previous seven days, 43% of Māori Year 10 students reported exposure, compared to 22% of European/other students.\(^13\)

One option for addressing the problem of tobacco smoking, and specifically the widespread exposure to secondhand smoke, is through policy approaches. At present, information is lacking on New Zealand stakeholders’ attitudes and responses to policies on reducing the exposure of children to smoking behaviour and to SHS, and on the optimal avenues for introducing such policies. Little work has been done on the processes for new tobacco policies, or on health policy processes in groups such as iwi (tribal groups). Research on Māori and Pacific health decisionmakers’ views is rare,\(^14\) and in-depth research about any Māori and NZ Pacific decisionmakers is uncommon.\(^15,16\) We found no published research on their views about smoking.

The aim of the research was to determine obstacles and opportunities within policy processes, for smokefree interventions appropriate to Māori. In particular, to explore Māori policymakers’ ideas on how to achieve progress on smokefree homes, cars and community property.

**Methods**

This research reports on the results of interviews conducted with senior Māori officials and Members of Parliament, and interviews with members of two case studies; one of a tribal health provider organisation, and the second, a formal collective of senior Māori policymakers employed by district health boards.

The criteria for interviewee selection included being a Māori policymaker (senior central government officials or ex-officials, or a Member of Parliament), closeness to processes relevant to tobacco control, and ability to articulate information. The sample was selected using purposeful sampling, including the use of reputational snowball recruitment methods.\(^17\) An advisory group of senior Māori researchers, including those with policy and tobacco control expertise, identified an initial list of 28 potential interviewees and four potential case study groups; this list was used to approach potential participants. Māori researchers conducted all components of the research, including formulating the interview schedule, collecting and analysing data.

The case study sites were selected as formal Māori collectives with an interest in Māori tobacco control, as accessible within the research timeframe, and as having the ability to influence policy at a local and or national level. One case study was a medium size Māori primary healthcare provider employing approximately 20 employees and servicing approximately 4000 clients. Six interviews were undertaken with the staff and tribal elders, who are affiliated with the provider and the governance of the organisation.

The second case study site was the group of senior Māori officials of the twenty one district health boards, who meet regularly as a formal collective to discuss key national health issues for Māori. Initially it was suggested that a focus group approach would be undertaken with the collective. However, it was considered by the group that individual interviews should be conducted with key people to represent the view of the collective. Three interviews were undertaken with members of the second case study site. The opportunity to be involved in the research was well supported by both case study groups.

A semi-structured interview format was created based on a comprehensive literature review of Māori policymaking and tobacco control, and was added to as the interviews progressed. The same interview schedule was used for both policymaker and case study interviews.
Open-ended questions were used to find:

- General ideas on how to achieve progress on smoking in homes, cars and community property;
- Particular interventions that the interviewees felt were most and least effective, practical, sustainable, politically feasible or desirable in some way; and
- The context, and obstacles and opportunities for such interventions.

The interviews were not conducted to find the extent of the policymakers’ knowledge, but their ideas and beliefs.

The interviews were conducted on the basis of confidentiality, with the results to be anonymous. All data collection occurred between May 2008 and March 2009. Ethics permission for the study was obtained through the University of Otago ethics process.

The data was examined for patterns and themes, and then all the material identified that related to the patterns identified was gathered. The use of semi-structured interviews, with some open questions, allowed for template analysis to identify themes. Template analysis is the coding of material within hierarchic groups, some based on the set questions. The selection of themes was discussed by the research team and advisory group, and compared to those in the literature available.

**Results**

Sixteen policymaker interviews were conducted, with 3 politicians and 13 officials/ex-officials. Including the case studies, a total of 25 interviews were completed.

Several key themes emerged from the research including, children as drivers for change, strong national and local indigenous leadership needed for change, delivering smokefree messages as part of wider healthy living approaches, targeting of the messages for greatest impact for Māori, central and local government having a significant role in the prevention of tobacco harm, tobacco tax revenue being spent on tobacco control, and the rights of children to smokefree environments.

**The context for changes around tobacco and Māori**—There was general agreement that tobacco smoking is highly addictive and requires support and intervention from many, including whānau. Almost all participants believed that most smokers have a desire to kick the addiction, but find it difficult to do so:

...It’s got to be more addictive than heroin because you look around society, when you’re working in Wellington and you’re walking down Lambton Quay (Central Business District) and you see seriously intelligent people standing out in the wind and the rain...and there is all of this public shame but they still do it.

Participant responses were varied on the issue of normalisation of tobacco within New Zealand and in particular within Māori culture. Some felt very strongly that smoking was still a normalised part of some sections of the Māori population, while others believed that tobacco smoking was now an unaccepted part of Māori society. One interviewee said.

...The product [tobacco] within Māoridom was seen as a normal cultural activity, now it’s not and I think we have to get to a point where we denormalise it.

The majority of participants believed that children have a fundamental right to be free not only from secondhand smoke but also from the role modelling of adults smoking. One person stated that it is the role of whānau (extended family) to ensure their tamariki (children) are safe.
...Yes, children’s rights are greater [than adults]. Children have a right to a safe environment and it’s the adult’s responsibility to ensure this.

Some made the comparison with alcohol policy.

...So if I want to smoke, more power to me, but I also need to be conscious of the impact that has on other people … we [government] certainly do that subtly and also quite explicitly around our drinking behaviour. So you get to holiday periods and suddenly you get bombarded on TV with a whole lot of ads around drink driving, wearing your seat belts, not speeding. So we’re linking our choice or our decision to have a drink with the impact that it might have on other people once we do that.

**The need for Māori approaches**—All participants argued that general population approaches (i.e. addressed to the whole population, Māori and non-Māori) are not the best way to support Māori to reduce smoking. While the goals for reduction may be the same across the whole population, the approaches need to take into account the specific social, political, historical and cultural differences for Māori. Most went on to say that Māori can make change if the message comes from someone they identify with, and many believed that a whānau-focused approach is more effective for Māori than a focus on the individual. One participant spoke of the need to ensure our legislative responses are meeting the needs of all groups within the wider population.

...You need to have a policy that is flexible enough to be able to respond to which ever group needs to use it. So it’s … like – got this kete [basket], got all these tools in it, this particular community can take that kete and go, [but] I want [just] those 3 tools, the rest I don’t need to use. And government needs to do that, because it needs to meet the needs of it’s entire population and it can’t take out one brush or one policy for everyone.

**The range of solutions**—The majority of participants interviewed said that children hold the key to making change within Māori households; largely as a motivator for quit behaviour. Participants described a duty and obligation to tamariki/children. They said that almost all whānau/families understood the negative role modelling of smoking, and that was often a sufficient motive for them to quit. Some interviewees felt it might be too late with the older generation, but educating our young ones and using children as “agents for change” was the best way forward.

...My mother only gave up smoking once the mokopuna [grandchildren] arrived, it was that easy, she knew it was wrong and didn’t want to harm them.

Other participants discussed a wider intergenerational approach.

...If there’s a whānau focus, … there is a sense of intergenerational responsibility and obligation to take care. Particularly for those of us who are in mid adult years, where we are both caring for children but we are in the process of caring for our kuia and kaumātua [elders] too. Our health matters. Their health is dependant on our health, therefore there is that responsibility for getting that message through.

Many participants believed that Māori leadership at a national, local, community and whānau level was fundamental to making change with Māori smoking rates. Almost all those interviewed agreed that Māori need to take ownership of the situation. They generally advocated starting locally with leaders within a whānau or hapū, and the need for them to lead by example, despite the problems with this approach.

...Unfortunately many of the respected people on a marae[meeting house] or within a whānau are smokers. It can be difficult to change behaviours and implement rules around smoking if iwi leaders are smokers themselves …. who’s going to tell a respected kaumātua what to do?

There was also some debate about the role of individual responsibility for behaviour change (and sometimes the guilt attached for individuals who don’t change) and the
role of government or wider structural change. While most saw the use of whānau/families in social marketing campaigns as positive and educative, a few saw it as unhelpful for those unable or unwilling to quit, due to a range of pressing and immediate social and economic challenges.

…It’s a bit like the cervical screening ads that were very guilt laden, you have to do it for your family. So what if you don’t? Does that mean you’re bad, that you have let down your family? … [Government] needs to be particularly careful around the assumptions of personal responsibility. Because while it is true everyone does have personal responsibilities for their own health and wellbeing, the process of colonisation and the systemic racism that still exists in both the health and the legal system mean that there are particular barriers to getting access to … information [for] Māori. … [And] if those systemic failures aren’t recognised, the message does not get through.

A number of participants talked about the over-use of the same messages in smokefree campaigns. They spoke of a need to move away from the specific focus of being smokefree, and wrapping it up in a broader healthy lifestyle approach, such as the Healthy Eating Healthy Action campaign, (a national public health campaign to reduce obesity).

…They are sick of it [smokefree messages]. We had a recent Māori golf tournament and people said they are sick to death of the same old smokefree messages. It’s been that way for 10 years now, it’s gone stale.

When discussing a particular after-school and holiday programme in the Hutt Valley, another interviewee said:

…The kids come together, they’re off the streets and out of trouble, they learn a number of things about being healthy, and smokefree messages might be part of that… it’s kaupapa Māori, it’s about who we are and the kids like it and get it.

All participants agreed that the government has a significant role in the prevention of tobacco harm. All agreed that a portion of tobacco tax revenue should be spent on tobacco control.

…There should be a hypothecated/tied tax regime. There’s a billion dollar tax take per year… and just $40 million out of the billion dollar tax take [is being invested in tobacco control], your math quite easily says this is not right.

Some believed that a blanket approach, such as legislation to ban tobacco products from Aotearoa/New Zealand, was the best idea and believed this could be done within a five year period:

…The only obstacle is lack of political will. If we had the courage today to pass a piece of legislation to ban the manufacture and sale of tobacco in Aotearoa, tomorrow there would be none [tobacco].

Others wished to see local body councils taking a stronger leadership role, for example by introducing smokefree bylaws for playgrounds and sports fields. While some participants identified that it would be difficult to enforce, the promotion of smokefree environments concept and the discussion it would raise was seen as useful. Some interviewees spoke of their own experiences introducing smokefree policies on their marae; this was generally positive but took some time to be adopted.

Other participants thought that it would be inappropriate for a Council to impose rules on Māori-owned land or resources such as urupa or Marae; they felt strongly that such changes needed to be owned by the people involved.
Discussion

The findings—Māori policymakers interviewed called for a strong interventionist role for central and local government in reducing disparities in tobacco smoke exposure. This is not surprising, when considered alongside a Treaty of Waitangi framework that holds government accountable for ensuring that Māori experience at least the same level of health as that of the wider population. There was clearly some opinion that the emphasis needs to move from constraining the individual to constraining the market, through managing the supply of tobacco. And that political will (other than that being demonstrated by some Māori members of government), is currently lacking in this area.

Māori leadership at all levels was considered critical to leading change. This included taking ownership of the situation, role modelling positive behaviours, and helping design tobacco control interventions in collaboration with tobacco control experts. The implicit Treaty agreement with government could be: share authority and appropriate levels of resources with Māori groups for the purpose of tobacco-free change, and Māori leadership within government and within tribal structures will be responsible for change.

One of the challenges that currently exists in engaging Māori leadership in tobacco resistance work is that many of the leaders smoke; this should not be an impediment to action. Tobacco resistance can take many forms, including policy level interventions and the creation of smoke free environments. This work does not require the advocate to be smokefree themselves but does require a commitment to a smokefree Aotearoa for future generations; a concept that the majority of Māori leadership may support.

The theme of children as a motivator of quitting has been found in research of smokers’ quit reasons. There is some evidence from the USA (with Latinos v whites) that ethnicity can be a factor in the extent to which smokers quit as an example to children. That Māori policymakers stressed the birth of children and grandchildren as a strong catalyst for quit behaviour, suggests that there is potential for advocacy through such policymakers for additional relevant quit support.

There was a strong theme that the rights of children clearly outweigh the individual rights of adults to smoke in privately owned spaces, for instance homes and cars, and that adults have a duty of care to protect children from harm. However there was no one clear view on how best to achieve changes in the area of smokefree environments around children. Some thought that the changes needed to be at a more structural level where the manufacture and supply of tobacco was limited, others called for a comprehensive approach requiring a “suite of programmes and responses” needing to be put in place, others said that we should not legislate for a smoking ban in cars, as people should be supported to make changes and choices for themselves in their private spaces.

While this research did not show a consensus on approaches for increasing smokefree environments for children, other New Zealand research does indicate strong Māori public and smoker support for a legislative framework banning smoking in cars with children.
Policy implications—A total ban on tobacco products within New Zealand, an approach receiving increasing support by Māori tobacco control advocates and Māori policy makers over the past five years, was supported by some of the Māori policy makers interviewed in this research. While a total ban may be unachievable in the near future, there is an onus on government to show that their alternatives are effective in reducing disparities for Māori.

Māori tobacco control should be a high priority for government, including a distinctive indigenous controlled approach to reducing disparities in outcomes. Approaches need to take into account the specific social, political, historical and cultural differences for Māori. Greater funding for various targeted programmes should come from tobacco tax revenue, and should be reflective of the health significance of high rates of smoking for Māori.

The call by interviewees, for a move towards a broader wellness approach for smokefree marketing to Māori, indicates an avenue to be considered when social marketing and health education messages are reviewed.

Limitations—While the search for themes used validated qualitative approaches which were conducted rigorously, the thematic selection from the data by another research group might be quite different. The small sample size means that the results from the study are not indicative of the opinion of all Māori policy makers; additional research is needed to explore the issues raised more widely. We note that contrasting Māori policy makers’ views with non-Māori policy makers’ would cast further light on approaches to policymaking.

Conclusions

The results indicate that Māori policy makers consider indigenous specific approaches and indigenous leadership critical for Māori tobacco-free advances. In addition, the research supports a strong role for central and local government to reduce disparities in tobacco smoke exposure. Funding for interventions could come from dedicated tobacco tax, and the mandate to act on behalf of children is provided through human rights frameworks. Harnessing indigenous values and principles related to health, family and children provides an impetus to change smoking behaviours, and was the preferred method of these Māori policy makers for delivering social marketing messages.

Competing interests: The authors have undertaken tobacco control work for health sector agencies.

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References:


Association of parent and best friend smoking with stage of adolescent tobacco smoking

Robert Scragg, Marewa Glover, Janine Paynter, Grace Wong, Judith McCool

Abstract

Objective compare the effect of parental and best friend smoking across the stages of adolescent smoking, from being a never smoker susceptible to smoking, to being a daily smoker.

Method national cross-sectional annual survey (2002-2006 combined) of 157,637 Year 10 students aged 14 and 15 years who answered an anonymous self-administered questionnaire.

Results the effects of smoking by parents and best friend varied with stage of adolescent tobacco smoking. Attributable risk calculations showed that parental and best friend smoking explained only 6.3% of susceptibility to smoking among never smokers, and 21.7% of non-smoking students who had ever experimented with cigarettes. The attributable risk for parental and best friend smoking progressively increased with smoking frequency, up to 78.7% for daily smoking. The effect of best friend smoking was stronger than parental smoking, although there was a synergistic effect of both variables on the risk of daily smoking.

Conclusion smoking by best friend and parents are strongly associated with current smoking by adolescents, but unrelated to susceptibility to smoke among those who are non-smokers.

The majority of adult tobacco smokers take up smoking during adolescence. A number of stages in the pathway to becoming a regular smoker during adolescence have been described including ‘triers’, ‘experimenters’, ‘regular users’ and ‘dependent users’.1 Cohort studies of adolescents have identified various trajectories through these stages to adult smoking, which combine measures of stability in smoking status over time along with early/rapid or late/slow adopters of smoking.2-6 However, once adolescents start trying or experimenting with smoking, the transition is mostly a one way process towards regular smoking,7 although some smokers start quitting in their early 20s.2 5

An early review of the predictors of youth smoking concluded that there was a high level of support for social learning variables, such as peer and family smoking, being involved in the initiation of tobacco smoking.8 In particular, the review found stronger evidence for an effect from peer smoking than for parental smoking. However, subsequent reports have provided conflicting evidence with regard to this conclusion. A Californian cohort study observed that friends’ smoking had a stronger effect on adolescent smoking behaviour, particularly initiation, than parental smoking;9 although a subsequent report from this study found that, while smoking by friends was important in the transition from trial to experimental smoking, parental smoking predicted the transition from experimental to regular smoking.10
The latter finding is supported by a US Mid-West cohort study which found that parental smoking was associated with regular smoking in adolescence and adulthood, but not with adolescent smoking experimentation; although the parental effects were not as strong as peer effects.²

In contrast, a New Zealand cohort study observed that parental smoking predicted smoking experimentation by age 13 years, while smoking at age 16 years was most strongly predicted by affiliation with smoking peers at 15 years.¹¹ Further, the US National Longitudinal Study of Adolescent Health concluded that adolescent smoking is more influenced by friend smoking than parent smoking, after comparing the relative sizes of the risk ratios for these two variables.¹²

A recent review has concluded, based on the strengths of relative risks, that peer or friend smoking is more strongly related to adolescent smoking than parental smoking.¹³ However, this conclusion has recently been challenged by the argument that the preferred measure of effect for ranking public health risk factors is the population attributable risk, which integrates into a single measure both the strength of a risk factor (i.e. the relative risk) and its frequency (prevalence).¹⁴ The population attributable risk (or fraction) can be interpreted as the proportion of outcome events (e.g. adolescent smoking) that can be attributed to (or explained by) an exposure variable (assuming the latter is causative).¹⁵

Applying this calculation to a national sample of New Zealand Year 10 students produced attributable risk values of 67% for best friend smoking and 64% for parental smoking combined with exposures under parental control such as allowing smoking in the home or amount of pocket money.¹⁴ Further, the influence of parents precedes that of peers, and previous studies which have controlled for the effect of friend and older sibling smoking in multivariate analyses will have underestimated the effect of parental smoking.¹⁶¹⁷

In this current paper we extend earlier results from the national Year 10 (aged 14 -15 years) surveys by comparing the relative importance of the influence of parental smoking and best friend smoking on the various stages of adolescent smoking, along the continuum from being a never smoker susceptible to smoking, to becoming a daily smoker.

Method

Annual national surveys of tobacco smoking by Year 10 (4th form) students (ages 14-15 years) have been carried out yearly since 1999.¹⁸ Each year, all New Zealand schools with Year 10 students were invited to participate in the survey by administering a short questionnaire to their Year 10 students in November. The current paper reports data from the 2002-2006 surveys which collected information on smoking by parents and best friend of students. The annual school response rate was 67% in 2002 (n = 309), 66% in 2003 (n = 312), 65% in 2004 (n = 319), 58% (n = 278) in 2005, and 78% (n = 291) in 2006. The Ethics Committee of the Ministry of Health in Auckland granted a waiver of the formal review and consenting processes.

School principals gave permission for teachers to supervise students while they completed the anonymous self-administered questionnaires in class. To maintain confidentiality, teachers did not examine the surveys for completeness.

Students answered a two-page questionnaire, which included questions on age, sex and ethnicity (self-assigned). Because students could choose more than one ethnic group, a priority system was used to classify any student choosing Māori as such, then any Pacific student as such, followed by any Asian
student as such, followed by European. Students answered whether their mother, father or best friend smoked; and whether people were allowed to smoke inside their house.

With regard to their own smoking status, students were asked “Have you ever smoked a cigarette, even just a few puffs?”, and if they answered “yes”, they were asked “how often do you smoke now?” Those who answered “no” to both questions were classified as never smokers, while those who answered “yes” to the first question and “no” to the second were classified as experimenters. Those who answered “yes” were queried about the frequency of their current smoking (at least once a day, at least once a week, at least once a month, less often, never).

Susceptibility to future smoking was assessed by asking “Do you think you will smoke a cigarette at any time during the next year?” Respondents were classified as non-susceptible only if they answered ‘definitely not’. Similar measures of susceptibility have been shown to predict experimentation with tobacco smoking in previous youth cohort studies. Students smoking monthly or more often were asked their age (in years) when they first started smoking monthly (for the years 2003-2005).

The total number of completed questionnaires returned by schools during the 5 year period was 167,488 (30,972 in 2002, 34,812 in 2003, 33,279 in 2004, 34,038 in 2005, and 34,387 in 2006), out of 229,240 on school rolls (73.1% student response). Analyses were restricted to 162,931 students who were 14 and 15 years old. We further excluded students with missing data for gender (n=509), ethnicity (n=1283), student smoking status (n=1,291), and parent or best friend smoking status (n=2,211). This left 157,637 students available for analyses.

All statistical analyses were made using SAS callable SUDAAN (Release 9.0.1, 2005) which corrects standard errors and confidence intervals for any design effect from clustering of students by school. The CROSSTAB procedure was use to calculate relative risks, and the MULTILOG procedure was used to calculate adjusted odds ratios (OR) while adjusting for age, gender and ethnicity, and to test for interaction. The population attributable risk was calculated by estimating the attributable proportion for the exposed cases within each exposure category using standard methods.

Results

The distribution of smoking status, by level of demographic variable and smoking status of parents and best friend, is shown in Table 1. Age was associated with an increased risk of smoking, with a higher proportion 15-year-old students distributed in the smoking categories than 14-year-old students (p<0.0001). Girls were more likely to be smokers than boys, who had a higher proportion of never smokers (49.3% v. 43.3%, p<0.0001). With regard to ethnicity, smoking levels were highest among Māori students, followed in order by Pacific, European and Asian (p<0.0001).

Students who lived in a house where smoking was allowed were three times more likely to be daily smokers than those who did not (20.7% v. 6.3%, p<0.0001).

When students were categorised by the smoking status of their parents and best friend, student smoking levels were highest among those with both parents and best friend being smokers (41.1% daily smokers), followed by students who had non-smoking parents but their best friend smoked (19.1% daily smokers), and by students with smoking parents but best friend a non-smoker (5.4% daily smokers), while smoking was lowest among students with neither parents nor best friend being smokers (1.8% daily smokers). Students were more likely to be exposed to parental smoking (40%) than best friend smoking (25%).

Table 2 shows the relative risk of never smoking students being susceptible to smoking in the next year, associated with parental and best friend smoking. Students of non-smoking parents with a best friend who smoked were most likely to think they would smoke during the next year (47.9%), followed by students with both parents and best friend being smokers (41.4%).
Table 1. Distribution of student tobacco smoking status, by demographic status and parental and best friend smoking

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Never smoked</th>
<th>Not smoking now</th>
<th>Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not susceptible</td>
<td>Susceptible</td>
<td>Experimenters</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>85,157</td>
<td>33.3</td>
<td>15.1</td>
<td>26.7</td>
</tr>
<tr>
<td>15</td>
<td>73,068</td>
<td>30.5</td>
<td>13.2</td>
<td>27.3</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>76,914</td>
<td>35.7</td>
<td>13.6</td>
<td>28.9</td>
</tr>
<tr>
<td>Female</td>
<td>80,311</td>
<td>28.4</td>
<td>14.9</td>
<td>25.2</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>European</td>
<td>103,392</td>
<td>32.5</td>
<td>16.6</td>
<td>26.7</td>
</tr>
<tr>
<td>Maori</td>
<td>28,496</td>
<td>16.6</td>
<td>7.8</td>
<td>32.4</td>
</tr>
<tr>
<td>Pacific</td>
<td>10,813</td>
<td>30.3</td>
<td>9.9</td>
<td>30.5</td>
</tr>
<tr>
<td>Asian</td>
<td>14,524</td>
<td>60.1</td>
<td>13.7</td>
<td>15.9</td>
</tr>
<tr>
<td>People smoke in house</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42,459</td>
<td>18.3</td>
<td>10.5</td>
<td>29.6</td>
</tr>
<tr>
<td>No</td>
<td>113,162</td>
<td>37.3</td>
<td>15.7</td>
<td>26.0</td>
</tr>
<tr>
<td>Parents smoke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22,770</td>
<td>5.7</td>
<td>4.0</td>
<td>20.0</td>
</tr>
<tr>
<td>No</td>
<td>40,349</td>
<td>29.8</td>
<td>13.5</td>
<td>36.5</td>
</tr>
<tr>
<td>Friend smokes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16,879</td>
<td>10.4</td>
<td>9.6</td>
<td>24.3</td>
</tr>
<tr>
<td>No</td>
<td>77,231</td>
<td>45.6</td>
<td>18.7</td>
<td>24.6</td>
</tr>
</tbody>
</table>

*Row percents.
Table 2. Relative risk, and attributable risk, of a never smoker being susceptible to smoking in next year.

<table>
<thead>
<tr>
<th>Parent smokes</th>
<th>Best friend smokes</th>
<th>Susceptible</th>
<th>Relative Risk (95% CI)#</th>
<th>Attributable cases</th>
<th>Population attributable risk+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes N (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>918 (41.4%)</td>
<td>1.45 (1.37–1.53)</td>
<td>285</td>
<td>1.3%</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>5449 (31.2%)</td>
<td>1.10 (1.06–1.13)</td>
<td>495</td>
<td>2.2%</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>1615 (47.9%)</td>
<td>1.63 (1.57–1.70)</td>
<td>624</td>
<td>2.8%</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>14,413 (29.0%)</td>
<td>1.00</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>22,395</td>
<td>50,312</td>
<td>1404</td>
<td>6.3%</td>
</tr>
</tbody>
</table>

*Percent of total of each parent-friend smoking category; # Adjusted for age, sex and ethnicity; +Attributable cases / total number of susceptible.

The effect of parental smoking by itself was weak, with only a 10% relative increase in the risk of being susceptible (to 31.2%) compared with the reference category of students with neither parents nor best friend being smokers (29.0% susceptible). The population attributable risk, which gives the proportion of susceptible students that can be explained by parental and/or best friend smoking, was only 6.3%, indicating that susceptibility is explained primarily by other risk factors.

A stronger effect from parental and best friend smoking was seen on the risk of current non-smokers having ever experimented with cigarettes (Table 3). The relative risk (RR) of being an experimenter was highest for students with both parents and best friend being a smoker (RR = 2.01) or with best friend only being a smoker (RR = 1.83). However, the attributable risk value was highest for students with parents only being smokers (11.9%) because students in this category made up a greater proportion (29%) of all students not currently smoking compared to the previous two categories (each 6%). Collectively, 21.7% of current non-smoking students who had ever experimented with cigarettes could be explained by parental and/or best friend smoking.

The relative and attributable risks of current student smoking associated with parent and best friend smoking are shown in Table 4. The general pattern for less than daily smoking by students was for the effect to be strongest for best friend smoking alone, followed by both parent and best friend smoking, with parent smoking alone having the lowest relative risks within each of these student smoking categories. In contrast, for daily smoking, the effect of both parent and best friend smoking combined (RR = 14.29) was more than the sum of the net effect of parent smoking alone (RR = 2.19) and best friend alone (RR = 8.25). This interaction was statistically significant (p<0.0001).

More than half of student daily smokers (53.9%) could be attributed to the combined effect of parent and best friend smoking. The other important feature of the results in this table is the progressive increase in the population attributable risk values with increasing frequency of smoking: from 28.3% for students smoking less than monthly up to 78.7% for those smoking daily. The pattern in Table 4 occurred within each sex,
with parental and best friend smoking, separately and together, being significantly (p<0.01) associated with all frequencies of adolescent smoking (data not shown).

Table 3. Relative risk, and attributable risk, of a non-smoker having ever experimented with cigarettes

<table>
<thead>
<tr>
<th>Parent smokes</th>
<th>Best friend smokes</th>
<th>Experimented N (%)*</th>
<th>No N</th>
<th>Relative Risk (95% CI)#</th>
<th>Attributable cases</th>
<th>Population attributable risk+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>4553 (66.9%)</td>
<td>2250</td>
<td>2.01 (1.94–2.07)</td>
<td>2288</td>
<td>5.4%</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>14,742 (45.6%)</td>
<td>17,610</td>
<td>1.52 (1.49–1.55)</td>
<td>5043</td>
<td>11.9%</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>4098 (54.7%)</td>
<td>3401</td>
<td>1.83 (1.78–1.89)</td>
<td>1859</td>
<td>4.4%</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>19,028 (27.6%)</td>
<td>49,858</td>
<td>1.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>42,421</strong></td>
<td><strong>73,119</strong></td>
<td></td>
<td><strong>9190</strong></td>
<td><strong>21.7%</strong></td>
</tr>
</tbody>
</table>

*Percent of total of each parent-friend smoking category; #Adjusted for age, sex and ethnicity; +Attributable cases / total number of experimenters.

Table 4. Relative risk and attributable risk of smoking, associated with smoking by parent and best friend, by frequency of student smoking.

<table>
<thead>
<tr>
<th>Parent smokes</th>
<th>Best friend smokes</th>
<th>N (%)* in smoking category</th>
<th>Relative Risk (95% CI)#</th>
<th>Attributable cases</th>
<th>Population attributable risk+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking &lt; Monthly</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>2672 (11.7%)</td>
<td>1.82 (1.72–1.93)</td>
<td>1204</td>
<td>9.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>3519 (8.7%)</td>
<td>1.41 (1.34–1.48)</td>
<td>1023</td>
<td>7.6%</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>2665 (15.8%)</td>
<td>2.44 (2.32–2.58)</td>
<td>1573</td>
<td>11.7%</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>4589 (5.9%)</td>
<td>1.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>13,445</strong></td>
<td></td>
<td><strong>3800</strong></td>
<td><strong>28.3%</strong></td>
</tr>
<tr>
<td><strong>Monthly smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>1648 (7.2%)</td>
<td>3.15 (2.90–3.42)</td>
<td>1125</td>
<td>18.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>1344 (3.3%)</td>
<td>1.54 (1.43–1.67)</td>
<td>471</td>
<td>7.5%</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>1707 (10.1%)</td>
<td>4.43 (4.10–4.79)</td>
<td>1322</td>
<td>21.2%</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>1549 (2.0%)</td>
<td>1.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>6248</strong></td>
<td></td>
<td><strong>2918</strong></td>
<td><strong>46.7%</strong></td>
</tr>
<tr>
<td><strong>Weekly smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>2321 (10.2%)</td>
<td>5.83 (5.28–6.44)</td>
<td>1923</td>
<td>30.7%</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>1084 (2.7%)</td>
<td>1.72 (1.57–1.89)</td>
<td>454</td>
<td>7.2%</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>1821 (10.8%)</td>
<td>6.69 (6.13–7.30)</td>
<td>1549</td>
<td>24.7%</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>1035 (1.3%)</td>
<td>1.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>6261</strong></td>
<td></td>
<td><strong>3926</strong></td>
<td><strong>62.7%</strong></td>
</tr>
<tr>
<td><strong>Daily smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>9361 (41.1%)</td>
<td>14.29 (13.1–15.6)</td>
<td>8706</td>
<td>53.9%</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>2170 (5.4%)</td>
<td>2.19 (2.03–2.36)</td>
<td>1179</td>
<td>7.3%</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>3214 (19.0%)</td>
<td>8.25 (7.57–8.99)</td>
<td>2824</td>
<td>17.5%</td>
</tr>
<tr>
<td>No</td>
<td>No</td>
<td>1398 (1.8%)</td>
<td>1.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>16,143</strong></td>
<td></td>
<td><strong>12,709</strong></td>
<td><strong>78.7%</strong></td>
</tr>
</tbody>
</table>

* Percent of total of each parent-friend smoking category; #Adjusted for age, sex and ethnicity; +Attributable cases / total number of smokers in same smoking frequency category.

Controlling for smoking in the house greatly reduced the relative risks associated with parental smoking, with this confounding effect weakening with reducing frequency of
student smoking. For example, compared to students not exposed to parent nor to best friend smoking, the RR of daily smoking in students exposed to both parent and best friend smoking decreased from 14.49 shown in Table 4 to 9.51 (95%CI: 8.74–10.36) with additional adjustment for smoking in the house; while the RR of smoking less than monthly for the same exposure declined from 1.82 in Table 4 to 1.67 (95%CI: 1.57–1.79) with additional adjustment for smoking in the house.

There was an inverse association between age of starting smoking and frequency of smoking (Table 5). Students who smoked daily were nearly twice as likely to have started smoking by the age of 9 years (18.2%) than students smoking weekly (11.8%) or monthly (10.1%).

Table 5. Distribution of age students started smoking monthly, up to 13 years, by current frequency of smoking: 2003–2005

<table>
<thead>
<tr>
<th>Age started smoking monthly (years)</th>
<th>Smoking frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td>&lt;9</td>
<td>18.2%</td>
</tr>
<tr>
<td>10</td>
<td>11.1%</td>
</tr>
<tr>
<td>11</td>
<td>14.4%</td>
</tr>
<tr>
<td>12</td>
<td>25.0%</td>
</tr>
<tr>
<td>13</td>
<td>31.3%</td>
</tr>
<tr>
<td>(N)</td>
<td>(8030)</td>
</tr>
</tbody>
</table>

The increased risk of early initiation in cigarette smoking for daily smokers remained statistically significant after controlling for demographic variables (p<0.0001). This finding is consistent with the results in Figure 1 which show that students with both parents and best friends who smoke have a higher prevalence of smoking at all ages, followed by students with only their best friend being a smoker, followed by students with only their parents being smokers, while students with both parents and best friends who are non-smokers have the lowest smoking prevalences at all ages.

![Figure 1: Cumulative percent of smokers (>monthly) at each year of age, by parental & friend smoking status - 2003-2005](image-url)
Figure 2 shows that the proportion of student smokers with a parent who smokes was higher in their younger years (age < 12 years), when it ranged from 68-72%, compared with 63% at ages 14 and 15 years.

Discussion

We have shown with data collected in 5 national surveys of New Zealand Year 10 students that the effects of smoking by parents and best friends vary with stage of adolescent tobacco smoking. The effects were found to be weakest in the earliest stage along the smoking trajectory, which is susceptibility to smoking among never smokers (Table 2), and progressively increasing with smoking frequency to be strongest among daily smokers (Table 4).

The very weak contribution of parental and best friend smoking to smoking susceptibility among never smokers indicates that other factors, such as possibly risk taking, family conflict and low self-esteem, are influential in this first step once children reach adolescence.

Our results in Table 3 showing a stronger relative risk of experimental smoking from exposure to friend smoking alone (RR = 1.83), than parental smoking alone (RR = 1.52), is consistent with previous studies which have reported larger relative risks or mean smoking levels for peer smoking compared with parental. However, our attributable risk calculations show that parental smoking, because it is more common than best friend smoking in this age group, is a more important contributor to experimental smoking, explaining 11.9% by itself, plus 5.4% in combination with best friend smoking, for a total parental effect of 17.3% (Table 3).

Thus, our results indicate that parental smoking has a key role, and along with peer smoking, collectively explains about one fifth of smoking experimentation among adolescents who are not current smokers.
At the other end of the smoking trajectory, parental and best friend smoking explain a large proportion of adolescent smoking, varying from 28.3% of less than monthly smokers up to 78.7% of daily smokers (Table 4). While best friend smoking has stronger relative risks and attributable risks than parental smoking, the latter is still an important contributor to adolescent smoking. Parental smoking is most strongly associated with daily smoking, with the attributable risk calculations showing that it explains 61.2% of daily smoking either by itself or in combination with best friend smoking (Table 4). The interaction (or synergistic effect) observed with daily smoking, whereby the combined effect of parental and best friend smoking (RR = 14.29) is more than the sum of the net effect for parental smoking alone (RR = 2.19) plus the net effect of best friend smoking alone (RR = 8.25), indicates that the combined effect of exposure to both parent and peer smoking contributes in part to daily smoking.

We have previously reported that students with parents who smoke are more likely to have best friends who smoke. The confounding effect from smoking in the home on the relative risk of daily smoking associated with parent and best friend smoking emphasizes the importance of the home environment in facilitating adolescent smoking. It is plausible that parents who smoke, by allowing smoking in the home, for example, create an environment where their children are more likely to interact with, and befriend, peers who smoke. Thus, part of the parental effect may be transmitted through peer smokers. Where there is joint exposure, the influence of parents typically can be expected to precede that of peers, with the consequence that parental influences are likely to be involved in the types of friends selected by adolescents.

The finding of a strong association between parental smoking and daily adolescent smoking is complemented by the earlier age of starting smoking by students who smoke daily compared with students who smoke less often (Table 5). This finding is consistent with previous research. Further, the proportion of adolescent smokers with a parent who smokes is highest for ages <12 years, after which the proportion of smokers exposed to friend smoking (alone) increases (Figure 2).

Overall, this pattern is consistent with the interpretation that students with parents who smoke, start smoking earlier than other smokers, so that they are more likely to be daily smokers in their mid-teens. Further, because many of these students with smoking parents socialise with other students who smoke, together they drive the spread of the smoking epidemic among the wider student body.

A major limitation of this study is the cross-sectional design which cannot distinguish cause and effect. The timing of when parental and peer effects occur can only be properly studied by cohort studies, which can determine, for example, whether perceptions by youth that smoking is the norm for children of their age precede the onset of susceptibility. Moreover, students defined as susceptible or experimenter at ages 14 and 15 years may not represent the experience of students who are smokers when they passed through these stages at younger ages.

Another limitation is that our measure of parental smoking did not allow for single parent and extended family households. However, such measurement error, if random, is likely to have resulted in under-estimation of the effects associated with parental smoking. In addition, we did not examine the full range of personal variables.
associated with adolescent smoking (e.g. personality, attitudes, parent attachment),
which could potentially confound the association with parental smoking.

In summary, we have found that smoking by both best friend and also parents explain
a high proportion of adolescent smokers. However, given evidence showing the
limited success of school-based interventions against the effects of peer-smoking,23
our findings support efforts to prevent youth tobacco smoking by targeting parents
who smoke, which may have a double benefit of reducing both adult and adolescent
smoking. In contrast, neither parental nor peer-smoking are related to smoking
susceptibility among adolescent non-smokers, which suggests other factors may be
involved in the progression to smoking once children reach adolescence.

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Fax: +64 (0)9 3737503; Email: r.scragg@auckland.ac.nz

References:
1. Mayhew KP, Flay BR, Mott JA. Stages in the development of adolescent smoking. Drug
2. Chassin L, Presson CC, Pitts SC, Sherman SJ. The natural history of cigarette smoking from
   adolescence to adulthood in a midwestern community sample: multiple trajectories and their
4. Soldz S, Cui X. Pathways through adolescent smoking: a 7-year longitudinal grouping
5. White HR, Pandina RJ, Chen PH. Developmental trajectories of cigarette use from early
7. Fergusson DM, Horwood LJ. Transitions to cigarette smoking during adolescence. Addict
10. Flay BR, Hu FB, Richardson J. Psychosocial predictors of different stages of cigarette
11. Fergusson DM, Lynskey MT, Horwood LJ. The role of peer affiliations, social, family and
    individual factors in continuities in cigarette smoking between childhood and adolescence.
SIDS-related knowledge and infant care practices among Māori mothers

David Tipene-Leach, Lynne Hutchison, Angeline Tangiora, Charlotte Rea, Rebecca White, Alistair Stewart, Edwin Mitchell

Abstract

Aim Māori have high SIDS rates and relevant information is needed to craft appropriate prevention strategies. The aim of the study was to determine what Māori mothers know about SIDS prevention, and to determine their SIDS-related child care practices.

Methods Māori mothers who gave birth in the Counties Manukau District Health Board area were surveyed about their SIDS related knowledge, and infant care practices and their reasons for using and their concerns about these practices. Results were compared with a similar 2005 survey of a largely European sample.

Results Knowledge of Māori mothers about SIDS prevention was much lower than for European mothers. More Māori infants slept prone and Māori mothers stopped breastfeeding significantly earlier. Although co-sleeping rates were similar, bedsharing increased to 65% for some part of the night. In addition, more than half of the Māori mothers had smoked in pregnancy and 21% of them were sharing a bed with their infant. Potentially unsafe soft objects such as rolled blankets or pillows were used by a third of mothers to help maintain the sleep position.

Conclusions Māori mothers have a poorer knowledge of SIDS prevention practices. The high rate of maternal smoking, the early cessation of breastfeeding, and co-sleeping where there was smoking in pregnancy were also areas of concern. Appropriate health promotion measures need to be developed for the high-risk Māori community.
40 SIDS deaths in 2005 were Māori and the Māori SIDS rate was five times that of non-Māori, non-Pacific infants. In addition, Māori rates of sudden unexpected deaths in infancy have not declined over the 2002–2008 period. Information on SIDS-related knowledge and infant care practice by Māori mothers is therefore needed. In 2008 therefore, a 2005 survey protocol that investigated these issues with a largely European sample was repeated with Māori mothers in the Counties Manukau (CM) District Health Board area.

Methods

In the period 21 July to 31 December 2008, 734 eligible Māori women gave birth in the Counties Manukau region. Mothers were ineligible if they had had a previous SIDS experience or their infants had not yet been discharged from hospital. The mother’s demographic details, parity and smoking status and the infant’s date of birth, National Health Index number, transfer/discharge details, birth-weight and gestation were collected from the birth records. A pathologist checked infant mortality records to ensure none of the infants belonging to listed mothers had died.

In order to better recruit Māori mothers to this survey we elected to use a telephone rather than postal contact, to use Māori women as interviewers (second year medical students on Summer Student Research Scholarships) and to home visit if telephone contact was not made. An attempt was made to phone the mothers when the infants were either 6-8 week or 3-4 month of age, as per the 2005 study protocol. If successful, they were given an explanation of the research and were invited to participate either by telephone interview or a home visit. If unsuccessful, they were phoned repeatedly until the babies fell out of the age brackets. Some, who were unable to be contacted, were visited at their home addresses and, if home, were invited to take part.

Participants were asked to list all factors that they thought might help reduce the risk of SIDS, and from where and from whom they had received their information. The interviewers enquired about current practices of maternal smoking, breastfeeding and both ‘last night’ and ‘usual practice’ infant sleep position and bed sharing. In addition, participants were asked about room sharing, pacifier use, plastic mattress wrapping, head shape concerns and positioning devices. Their concerns about and reasons for using these practices was also surveyed. An information sheet regarding the research project, SIDS prevention pamphlets, and a small token of appreciation (a $20 petrol voucher) were later posted to the mother.

The socioeconomic status of each infant was derived from the NZDep2006 code10 based on the mesh block of the place of residence. The survey results from the two age groups were compared and then the overall data were compared to the previous survey in 2005 using the chi-square test. Survival analysis was used to compare breastfeeding cessation differences between the two surveys. To estimate the proportion of bed-sharing in the non-participants, the observed number was extrapolated within socioeconomic categories and then summed to give an estimate of the number sleeping in their own bed. Division of this number by the number of births gave the population proportion.

The study received ethical approval from the Auckland Regional Ethics Committee and the Counties Manukau Clinical Board.

Results

Participants—Of the 734 eligible mothers, 315 were able to be contacted via telephone or home visit and of these, 16 declined to participate, leaving 299 (41%) of the cohort who participated. Of those who were not contactable 22% had an invalid telephone number or address, 66% continually did not answer their phone and 12% had babies who fell out of the age range during the contact period.

Non-participants—Those who participated in the study were compared with the non-contactable/declined families. Information on geographical location, maternal age, maternal smoking, parity, infant birth weight and gestation was available for the non-participant group. Non-participating mothers were more likely to be smokers.
(p=0.004), to be multiparous (p=0.04) and were of lower socioeconomic status (p=0.006) than the participants. This difference may have some influence on the estimates derived from the survey, in particular, bed-sharing. In the non-participants this was estimated using geocodes and smoking status, and there was little difference between the participants and the non-participants for either analysis.

**Participant demographics**—There were no significant differences between the 6-8 week (n=123) and the 3-4 month (n=176) aged infant groups for any of the variables studied and, as in the 2005 survey, the results were pooled.

The Māori mothers were younger (26 years, SD 6.5) than the NWH mothers (33 years, SD 5.1). Eighteen percent (1% NWH) were under the age of 20 and 26% (5% NWH) were between 20–24 years of age. Thirty-four percent (48% NWH) were first time mothers. The mean birth weight of the infants was 3362g (3413g, NWH) and 9% (12% NWH) were preterm.

**Table 1. SIDS prevention factors cited by the mother**

<table>
<thead>
<tr>
<th>SIDS prevention factor</th>
<th>CM Survey (n=299) n (%)</th>
<th>NWH Survey (n=278) n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep baby on back* †</td>
<td>206 (68.9)</td>
<td>234 (84.2)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Don’t smoke during pregnancy or around baby* †</td>
<td>76 (25.4)</td>
<td>202 (72.7)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Avoid bed sharing during sleep* †</td>
<td>102 (34.1)</td>
<td>128 (46.0)</td>
<td>0.004</td>
</tr>
<tr>
<td>Breastfeed †</td>
<td>12 (4.0)</td>
<td>96 (34.5)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Keep soft objects/loose bedding out of the cot; keep face clear*</td>
<td>129 (43.1)</td>
<td>77 (27.7)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Avoid overheating*</td>
<td>11 (3.7)</td>
<td>74 (26.6)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Use a firm sleep surface*</td>
<td>9 (3.0)</td>
<td>47 (16.9)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Use a pacifier at nap time and bedtime*</td>
<td>5 (1.7)</td>
<td>10 (3.6)</td>
<td>0.19</td>
</tr>
<tr>
<td>Sleep in same room as parent* †</td>
<td>14 (4.7)</td>
<td>4 (1.4)</td>
<td>0.03</td>
</tr>
<tr>
<td>Avoid using secondhand crib mattresses</td>
<td>0 (0.0)</td>
<td>26 (9.4)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Other, e.g. avoid alcohol/drugs around baby, wrap mattress in plastic, use natural fibres, use clean bedding, aired sleeping space, new mattress, feet at end, wind well, etc.</td>
<td>76 (25.4)</td>
<td>67 (24.1)</td>
<td>0.77</td>
</tr>
<tr>
<td>Wrong answer, e.g. side or prone sleeping</td>
<td>1 (5.0)</td>
<td>7 (2.5)</td>
<td>0.13</td>
</tr>
<tr>
<td>No risk factors known or listed</td>
<td>35 (11.7)</td>
<td>24 (8.6)</td>
<td>0.27</td>
</tr>
</tbody>
</table>


**SIDS prevention knowledge (Table 1)**—The most common SIDS prevention factor, cited by 69% of the mothers (84% NWH), was to sleep baby on its back. Smoking in pregnancy was mentioned as a risk factor by only 25% of mothers (73% NWH, p<0.0001). As the source of information, 72% of participants cited the midwife (54% NWH) while 56% cited Plunket (27% NWH). Only 6% (40% NWH) of the surveyed population said information came from an antenatal class. Eighty-three percent (70% NWH) however, reported receiving a pamphlet about SIDS prevention from the midwife, Plunket or the hospital (p=0.0002).
### Table 2. Position or positions in which baby placed to sleep

<table>
<thead>
<tr>
<th>Sleep position</th>
<th>CM Survey (n=299)</th>
<th>NWH Survey (n=278)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Last night</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back only</td>
<td>210 (71.0)</td>
<td>201 (72.3)</td>
<td>0.65</td>
</tr>
<tr>
<td>Side only</td>
<td>56 (18.9)</td>
<td>39 (14.0)</td>
<td>0.14</td>
</tr>
<tr>
<td>Front only</td>
<td>18 (6.1)</td>
<td>4 (1.4)</td>
<td>0.004</td>
</tr>
<tr>
<td>Side &amp; back</td>
<td>9 (3.0)</td>
<td>34 (12.2)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Front + back</td>
<td>1 (0.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back+side+front</td>
<td>2 (0.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usually</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td>170 (56.9)</td>
<td>180 (64.8)</td>
<td>0.06</td>
</tr>
<tr>
<td>Side</td>
<td>42 (14.1)</td>
<td>29 (10.4)</td>
<td>0.21</td>
</tr>
<tr>
<td>Front</td>
<td>13 (4.3)</td>
<td>8 (2.9)</td>
<td>0.30</td>
</tr>
<tr>
<td>Side &amp; back</td>
<td>48 (16.0)</td>
<td>61 (21.9)</td>
<td>0.08</td>
</tr>
<tr>
<td>Front + back</td>
<td>11 (3.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back+side+front</td>
<td>9 (3.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side+front</td>
<td>6 (2.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sleep position (Table 2)**—The “front only” sleeping position was much more prevalent among Māori (6.1%) than European (1.4%) in the ‘last night’ category than in the ‘usually’ category (4% CM vs 3% NWH). Overall, 13% (3% NWH) ‘usually’ slept their infants in some combination of sleep positions that included front. The prevalence of ‘usually’ slept on the side, on the side and back but not the front and the back only positions were similar between groups.

Eighty-five percent of mothers choosing the unsafe side and prone positions gave “baby sleeps better” as the reason. “Safety” (68%) and “recommended by health professional” (28%) were important reasons for the back position. Those who slept baby on the side plus on the back did so for “better sleep” (63%), “safety” (42%) and “head shape concerns” (27%).

Unexpectedly, 27% of mothers who had cited back sleeping as a preventive factor for SIDS did not sleep the infant on the back. Overall, there were few (n=7) concerns expressed about the choice of sleep position.

### Table 3. What bed does baby sleep in?

<table>
<thead>
<tr>
<th>Bed</th>
<th>CM survey Last night n (%)</th>
<th>NWH Survey Last night n (%)</th>
<th>CM survey Usually n (%)</th>
<th>NWH Survey Usually n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own bed</td>
<td>254 (85.8)</td>
<td>228 (82.3)</td>
<td>244 (81.6)</td>
<td>233 (83.8)</td>
</tr>
<tr>
<td>Parental bed</td>
<td>27 (9.1)</td>
<td>29 (10.5)</td>
<td>24 (8.0)</td>
<td>24 (8.6)</td>
</tr>
<tr>
<td>Both own+parental</td>
<td>13 (4.4)</td>
<td>18 (6.5)</td>
<td>28 (9.4)</td>
<td>18 (6.5)</td>
</tr>
<tr>
<td>Other shared</td>
<td>2 (0.7)</td>
<td>2 (0.7)</td>
<td>3 (1.0)</td>
<td>2 (0.7)</td>
</tr>
</tbody>
</table>
Table 4. How long did baby share a bed last night?

<table>
<thead>
<tr>
<th>Time</th>
<th>CM survey (n=194)</th>
<th>NWH survey (n=77)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>&lt;2 hours</td>
<td>118 (60.8)</td>
<td>33 (42.9)</td>
</tr>
<tr>
<td>2–5 hours</td>
<td>38 (19.6)</td>
<td>13 (16.9)</td>
</tr>
<tr>
<td>&gt;5 hours</td>
<td>38 (19.6)</td>
<td>31 (40.3)</td>
</tr>
</tbody>
</table>

**Bed sharing/co-sleeping (Table 3 and 4)**—In response to the question “What bed does your baby sleep in?” most infants in this survey slept in their own bed ‘last night’ (86%) and ‘usually’ (82%), but nearly one fifth usually co-slept for some or all of the night. This is similar to the NWH survey.

However, when enquiring in a different fashion, i.e. “If baby shared a bed last night, how long did they share for?” 65% of mothers (194 of the 299) indicated some bed sharing (NWH 27%) and thirty-nine percent of those (57% NWH) shared for >2 hours.

Reasons given for sharing a bed >5 hours varied as follows: “prefer closeness” (42%), “for breastfeeding” (29%), “baby sleeps better” (21%), “can keep an eye on baby” (18%), “for short naps or settling” (11%), and “for cuddles/play/bonding” (8%). For mothers in Table 3 who reported usually participating in some bed-sharing, 87% had no concerns, but 9% expressed concerns about the safety of doing so.

**Smoking**—In pregnancy, 53% of mothers had smoked (8% NWH), with a mean of 8 (SD 5.6) cigarettes per day. In the last 24 hours, 51% had smoked. The reported maternal smoking in the Māori mothers was identical to that of Māori women in the NZ Tobacco Use Survey, 2005, but the much lower rate reported for European mothers in the 2005 survey was markedly below the known 19% prevalence. In other words, European mothers either did not report their smoking in pregnancy or stopped smoking. Māori did not. Worse, 21% of mothers (1% NWH) both smoked in pregnancy and ‘sometimes’ or ‘always’ co-slept with their infant.

**Breastfeeding**—Mothers who reported ever breastfeeding their infants comprised 91%, (97% NWH) although only 74% of 6–8 week infants and 51% of 3–4 month infants were still breastfeeding at the time of the survey. Survival curve analysis of the time of breastfeeding cessation showed that Māori mothers stopped breastfeeding significantly earlier than the 2005 survey mothers (p<0.0001) (Figure 1).

When compared with the 2005 survey, Cox regression analysis of other factors associated with earlier cessation of breastfeeding was significant for mothers aged under 20 (p=0.04), maternal smoking during pregnancy (p=0.005), and the use of a pacifier (p=0.0002). Bed sharing was not associated with breastfeeding cessation.
Figure 1. Breastfeeding cessation survival curve analysis: Māori survey compared with 2005 survey

Positioning devices—While 46% of mothers (32% NWH) used a positioning system of some sort, only a few (10%) were of a commercial variety, and 36% of Māori infants had an unsafe homemade positioning system such as a pillow, rolled blanket or tight wrapping. The main reasons for these included “keep baby positioned”, “safety” and “help baby feel secure”. Very few mothers had any concerns about positioning systems.

Discussion

This survey has established for Māori mothers some previously unknown points regarding SIDS related knowledge and infant care practices. It has established the prevalence of Māori infant co-sleeping where there was smoking in pregnancy (21%), an extremely high-risk practice, with a greatly increased SIDS risk, particularly in younger infants, with odds ratios ranging from 5 to 29. Habitual prone sleeping (13%) and the presence of soft objects in the sleeping environment (36%) have been clearly demonstrated. These are the most commonly reported risk related occurrences in SIDS deaths.

The survey has also highlighted important differences between Māori and European women and because the European study data is only 3 years older than the present Māori study data, there seems little to preclude such a comparison.

Secondly, it seems that these behaviours may well be related to the reported poor knowledge of SIDS related information among Māori mothers. The effectiveness of the national SIDS-related health promotion programme and the relevance of its
messages for the known high risk group in New Zealand are therefore bought into question.

The early cessation of breastfeeding among Māori mothers and the poor awareness of smoking as a SIDS risk factors are outstanding examples of this. Lastly, we found that participants were far more likely to have heard the information that they did know from a midwife, from Plunket or from the hospital rather than from an antenatal class and this fits well with the known low attendance of antenatal class by Māori women. It seems therefore that both the currently mandated formats of imparting infant care related health promotion messages fail Māori mothers.

Current smoking cessation programmes are not adequately meeting the needs of Māori women, particularly those who are pregnant—this is despite a recent survey by Wilson et al showing that 85% of Māori smokers wished they had never started smoking. Action to urgently support Māori smoking cessation in pregnancy was called for in 2003, but no Māori oriented action has eventuated.

Stuck in the old public health mode of ‘providing equitably for everyone’, we have been unable to grasp the arguably more effective approach of dealing directly with the preventive health needs of the high risk Māori community. In addition, safe sleeping environments messages have revolved around the ‘don’t bedshare’ approach and those at highest risk among this Māori group have rejected this.

Māori messages need to gain priority. Indeed, a Māori community promoted safe sleeping environment, the wahakura (a woven flax bassinet capable of being taken into the shared bed) takes an alternate approach of attempting to make the bed-sharing/co-sleeping environment more safe. Notably, two of the three recommendations of the recent 2009 Child and Youth Mortality Review Committee’s Fifth Report to the Minister of Health are about smoking in pregnancy and safe sleeping environments—particularly pertinent to Māori infants.

Participation in this survey has been smaller than desired—but 315 of the potential cohort of 734 were unable to be contacted and transience of members of the lower socioeconomic communities explains this. On the other hand, the 95.5% participation by those able to be contacted, speaks for the success of the sampling strategy, that is, contact by researchers of the same sex and same ethnicity with follow-up by home visiting. Notwithstanding the participation rate of only 41%, the extrapolation analysis from the available data of those non-contactable, reassures us that we have valid data overall. The number of invalid phone numbers again attests to the transiency of residence in this socioeconomic group. Increasing the recruitment would demand a strategy where the research was seen to have arisen from and to be based in the community of interest.

Conclusions

Despite limitations, this study has highlighted important information about the current state of knowledge among Māori mothers about child care practices and the prevalence of and the reasons for using such practices. The challenge now is to develop health promotion tools that are appropriate in this community and that might improve knowledge and therefore change behaviour, particularly with regard to
smoking cessation, safe sleep position, safe sleeping environments, and duration of breastfeeding.

**Competing interests:** None.

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**References:**


Preventing cardiovascular disease: a review of the effectiveness of identifying the people with familial hypercholesterolaemia in New Zealand

Lauretta A Muir, Peter M George, Andrew D Laurie, Nicola Reid, Lisa Whitehead

Abstract

Aim To identify the diagnostic and treatment rates for familial hypercholesterolaemia (FH) in New Zealand.

Methods The FH data held by Canterbury Health Laboratories and the Canterbury District Health Board lipid clinic was examined to give an indication of the level of identification and treatment of FH in both Canterbury and New Zealand.

Results Between 2004–08, 588 people, out of a possible 10,500 affected people, who presented with a pre-treatment cholesterol $\geq 8.0$ mmol/L, lipid stigmata or a strong family history of cardiovascular disease (CVD), were tested for low density lipoprotein (LDLR) and apolipoprotein B (APOB) mutations. Mutations were identified in 76 cases (13%). 353 relatives were screened and 159 (45%) were found to have FH. This data suggests that less than 20% of the affected people in Canterbury have been diagnosed and less than 2.2% nationally.

Conclusion FH diagnostic services in New Zealand appear significantly underdeveloped thereby denying affected people the opportunity of early treatment to reduce the risk of premature cardiovascular events. Cascade screening is shown to be a cost effective and efficient approach to identifying people with FH.

Heterozygous FH is caused by an inherited defect in the function of the low density lipoprotein (LDL) receptor gene that reduces the catabolism of LDL particles, markedly increasing plasma cholesterol levels. It is one of the most common clearly inherited conditions, with prevalence of at least one in 500 in Western populations thereby affecting approximately 10,500 people in New Zealand (NZ).

Untreated FH carries substantial health risks. Those affected will have severely elevated plasma cholesterol levels from the age of two onwards. This confers a greatly increased risk of cardiovascular disease (CVD) in both men and women, with a 100-fold increase in young men. 85% of males and 50% of females with FH will suffer a premature coronary heart disease event before the age of 65 years and as many as 30% will not survive their first myocardial infarction.

It has been estimated that in the Western world only 20% of cases of FH are detected and less than 10% are being adequately treated. A lack of diagnosis creates a major barrier to the effective prevention of vascular disease, and affects the quality of life and economic and social contributions of affected people and their families. It also causes significant health expenditure such as the costs involved in the provision of cardiac and coronary care, coronary artery surgical procedure and stroke management.
For example, a coronary artery bypass graft surgery can cost up to $NZ50,000 and an angioplasty up to $NZ15,000.

FH can be easily diagnosed and treated giving remarkable health benefits.\textsuperscript{3,6–7} A provisional diagnosis is made on the basis of the plasma total and LDL cholesterol concentrations, combined with either a clinical examination and family history (together called the phenotype), or a genetic test. Genetic testing is the preferred diagnostic method because it provides an unequivocal diagnosis (genotype).\textsuperscript{8} A full LDL gene analysis costs approximately $NZ500. With treatment, which carries a cost of approximately $NZ700 per annum, those affected are likely to have the same life expectancy as the general population, especially if treatment is started in early teenage years.\textsuperscript{6–8}

As first-degree relatives of people who have an LDL receptor mutation have a 50% risk of also having the mutation,\textsuperscript{9} the most cost-effective public health/preventive strategy to reduce the impact of FH, is to identify relatives of diagnosed people through cascade screening using clinical and DNA-based diagnostic criteria.\textsuperscript{4,10–11} This involves working with a diagnosed patient (the index patient or proband) to identify family members, who are contacted and given advice about the condition and offered the opportunity to have mutation analysis.

**Diagnosis and treatment of familial hypercholesterolaemia in New Zealand**

**Method**

National FH data is not currently collected. We therefore review the ability of the NZ public health sector to effectively and efficiently diagnose and treat FH on the basis of laboratory data collected by the Canterbury Health Laboratories (CHL) and cascade screening data held by the Canterbury District Health Board (CDHB) Lipid Clinic. These sites were chosen because CHL is the only laboratory in New Zealand that undertakes testing for FH related mutations and integrates positive results with cascade screening.\textsuperscript{12,13} The mutation analysis and cascade screening data is compared to the likely number of people affected by FH both in Canterbury and nationally.

**Results**

*Mutation screening*—In the 4-year period between 2004 and 2008 a total of 588 people who presented with a pre-treatment cholesterol $\geq 8.0$ mmol/L, lipid stigmata or a strong family history of CVD, were tested for mutations of the LDL receptor gene; an average of 147 per annum. Mutations were identified in 76 patients (13%) (Table 1).
Table 1 CDHB FH mutation screening 2004–2008

<table>
<thead>
<tr>
<th>No of referrals 2004–2008</th>
<th>Identified mutations</th>
<th>Number of relatives screened</th>
<th>Positive familial LDLR mutation</th>
</tr>
</thead>
<tbody>
<tr>
<td>588</td>
<td>76 (13%)</td>
<td>353</td>
<td>159 (45%)</td>
</tr>
</tbody>
</table>

Resource levels only permitted minimal genetic testing of patients with low LDL levels but with the appropriate phenotype.

*Cascade screening*—Patients identified with a mutation were referred to a clinical nurse specialist (CNS) at the CDHB Lipid Clinic for cascade screening. 95 patients with a severe disease phenotype who met the criteria for mutation analysis but did not have an identified mutation, were also referred.

Cascade screening protocols were based on the National Institute for Health and Clinical Excellence, (NICE) guidelines. All referrals provided contact details for their relatives who were sent letters explaining FH, consent forms, and laboratory request forms. Relatives who wanted to be tested returned the consent forms to the clinic and had a blood sample taken at their local laboratory, which was forwarded to CHL. 353 relatives were screened for mutations and 159 (45%) were found to have the familial LDLR mutation (Table 1).

Analysis of cascade screening activities shows that the lack of dedicated resources and the absence of a national database caused up to a 6-month time lag between referral and screening, and minimal follow-up of relatives whose contact details were unknown, did not reply, or lived outside the Canterbury region. There was no follow-up of patients with a severe disease phenotype but no identified mutation, or of children of index patients who reached their teenage years. There was no international follow-up of relatives. The lack of a national database largely prevented the dissemination of information to health professionals regionally and nationally. The position in July 2009 is indicative of service levels over the previous 5 years. (Table 2)

Table 2. Cascade screening in Canterbury, July 2009

<table>
<thead>
<tr>
<th>Category</th>
<th>No of index patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDL mutation identified but family cascade screening yet to commence.</td>
<td>8–10</td>
</tr>
<tr>
<td>Clinic waiting for names and contact information of siblings and children from identified index patients.</td>
<td>20–30</td>
</tr>
<tr>
<td>Letters and forms for LDLR mutation Lab screen request sent to children and siblings. Clinic waiting for replies/results. Minimal follow-up.</td>
<td>10</td>
</tr>
<tr>
<td>Partial screening of siblings and children—prioritised by age and history. Parents advised to have children under 15 screened by the time they are 15 years of age.</td>
<td>90–111</td>
</tr>
<tr>
<td>Local extended family follow-up.</td>
<td>8–10</td>
</tr>
<tr>
<td>National or international follow-up.</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>171</strong></td>
</tr>
</tbody>
</table>
In spite of these limitations, the rate of diagnosis in relatives who agreed to mutation screening (45%) is consistent with international evidence that indicates that cascade screening of first-degree relatives is a cost-effective approach to diagnosis.\textsuperscript{15}

*Rates of diagnosis*—The Canterbury region has a population of approximately 600,000, or about 13\% of the national population.\textsuperscript{16} Of the 10,500 people that are likely to be affected nationwide, approximately 1,200 are expected to be in Canterbury with the remainder distributed throughout the country. Referrals generally came from the CDHB Lipid Clinic and approximately 50 referrals were from outside Canterbury.

The number of genetic screens undertaken between 2004 and 2008 suggests that less than 20\% of the affected individuals in Canterbury have been diagnosed and, at current rates of identification it is likely to take up to 21 years to detect all FH affected people in the region.

The situation appears worse nationally. Referrals to CHL for mutation screening and follow-up of members of the extended family of identified patients suggest that possibly less than 2.2\% of people in NZ with FH have been identified. This implies that up to 10,000 affected people have not been diagnosed and are at risk of developing premature CVD.

**Discussion**

A number of variables affect the ability of the health sector to diagnose FH and effectively prevent the onset of vascular disease in this group of people. The aetiology of FH and the steps involved in diagnosis, means that it does not fit neatly into a specific service or sector.

Diagnosis and treatment involves the specialist expertise of various health care providers in areas as diverse as endocrinology, chemical pathology, molecular genetics, lipid clinics, cardiology, radiology, paediatrics, dietetics, genetic counselling etc., with the locus of care spanning secondary and tertiary hospital settings, publicly and privately owned laboratories, private specialist clinics and general practices.

The patient spread is across all age groups. Cascade screening is unlikely to be carried out as part of a normal patient consultation because it is time consuming and requires expertise in both FH and genetic screening. National guidelines for reducing the risk of CVD that recommend population screening of men over 45 years and women over 55 years\textsuperscript{17} are unlikely to assist in diagnosis until after vascular disease is well advanced.

Consistent with the findings of Grey et al (2008), there are likely to be diagnosed and undiagnosed cases of FH in primary care that are not known to secondary care and that significant potential exists to identify new cases of FH in primary care who could act as new index cases for a family screening programme.

**Conclusion**

FH is a clearly defined condition with a poor prognosis. Yet it is relatively easy to diagnose and treat resulting in remarkable improvements in health outcomes. FH diagnostic services in New Zealand appear significantly underdeveloped thereby denying affected people the opportunity of early treatment to reduce the risk of
premature cardiovascular events. Cascade screening is a cost effective and efficient approach to diagnosis but New Zealand lacks the necessary supporting infrastructure. The development of an integrated, national model of care that is widely disseminated and clearly understood by primary, secondary, and tertiary clinicians is likely to significantly reduce the risk of CVD, reduce sector costs, and improve health outcomes.

**Competing interests:** None known.

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**References:**

Moving forward with healthcare prioritisation

David Hadorn

In a recent Cabinet Paper,¹ Tony Ryall, New Zealand’s Minister of Health, called for creation of a “national assessment and prioritisation function for health technologies and interventions.”² This followed the Ministerial Review Group’s report,³ which, as noted by Mr Ryall:

…identified improved prioritisation as way to manage costs and improve safety and effectiveness of health services, as has been achieved by PHARMAC with respect to community pharmaceuticals. This requires smarter control of the introduction of new technology and interventions…while decreasing the utilisation of less effective and outdated services.⁴

Following MRG’s advice,⁵ Mr Ryall proposed that the principal locus of prioritisation be vested in ‘a reconfigured and strengthened’ National Health Committee (NHC). He cited NHC’s ‘long pedigree of high quality work’ and consequent ‘credible brand’ as reasons for this choice.

The Minister’s desire “to establish a national prioritisation process as quickly as possible”⁶ is welcome and timely. Public expectations of what the New Zealand health system should provide are increasingly diverging from what can be afforded, especially in view of the continuing development of expensive new drugs and medical technologies.

Several key questions remain to be decided by Cabinet before a national system of prioritisation can deliver what is required, including:

• How NHC should select and assess interventions
• Whether and how NHC decisions should affect or constrain District Health Boards’ funding decisions, and
• Whether and how groups of similar products and services (e.g., new technologies, devices, diagnostics) should be ring-fenced and subjected to a fixed budget, PHARMAC-style.

These as-yet unanswered questions, especially #2, were cited by Treasury as reasons to ‘defer’ development of a prioritisation programme:

Deferral would enable the decisions to be taken further in terms of how prioritisation will in fact work and how any prioritisation recommendations will be implemented (crucially, how it will or will not constrain district health boards [DHBs]). These design details matter, as there is a risk of fuelling, rather than dampening, health cost pressures if the model is wrong.⁷

In this paper, I will discuss the above three unanswered questions, providing suggestions on ‘how prioritisation will in fact work’, or at any rate how it might work.

First, some relevant history.

The Minister’s proposal to develop a national prioritisation capability signals the resumption of an undertaking first begun during the National Party Government-led health reforms in the early-1990s.⁸,⁹ Included in these reforms was creation of drug
purchaser PHARMAC and the Core Services Committee (CSC), whose mission was to define ‘core’ health services, i.e. those services that should be publicly funded. But in 1996, after 3 years of work, CSC abandoned (or was asked to abandon) its quest to ‘define the core’, and was accordingly renamed the National Health Committee. NHC remained intermittently involved in prioritisation through 2004, mostly evaluating efforts conducted by other public health bodies (i.e. Health Funding Authority [HFA], Ministry of Health [MOH], DHBs), but after 2004 prioritisation no longer figured in NHC’s (or any other national-level public health body’s) work programme.

At the other extreme, PHARMAC, which like CSC began work in 1993, continues to set priorities amongst pharmaceutical products and is frequently pointed to (including by MRG and Mr Ryall) as a potential model for prioritisation more broadly.

Why did the original CSC stop trying to define the ‘core’ after only three years? No consensus exists on exactly ‘what happened’, but from my perspective (I worked for CSC from 1993–1997), the task of setting priorities explicitly enough to be used for funding decisions came to appear to be too difficult. In addition, CSC was under constant pressure to distance itself from the US State of Oregon, which was also setting healthcare priorities during that same time, using a controversial approach that involved developing a long list of many different kinds of services, then ‘drawing a line’ to separate services to be covered under public insurance (‘above the line’) from those that would not covered (‘below the line’).

Much of the criticism aimed at Oregon during that time was deflected on to CSC—a situation no doubt discussed by leaders of the National Party and New Zealand First, which formed New Zealand’s first MMP coalition government in 1996. (Oregon’s programme and list-based method continue to this day.)

It is not clear what lessons should be drawn from this original experience, except perhaps that explicit prioritisation is very difficult and almost inevitably controversial. Additional discussion on this point amongst people involved at the time would be useful.

**How should NHC select and assess interventions?**

As noted by Treasury, ‘design details matter’. The social significance of NHC’s prioritisation decisions, including potentially determining access to desired services, requires that the methods to be used by NHC be specified by the Minister, at least to a substantial extent. Amongst these methods should be consideration of prioritisation criteria specified by the Minister (e.g. effectiveness, value for money, reduced inequity), grounded in a view of what New Zealand society wishes such decisions to be based on.

Mr Ryall provisionally endorsed MRG’s recommendation that services selected for assessment be ‘at the margin’ for both new investments and disinvestments. This would require that services be assessed and compared in terms of benefits expected for patients with defined clinical indications. All services are of marginal (or indeed of no or negative) value except with respect to defined clinical indications.

An efficient method for gaining information concerning these indications for a wide range of services would be to ‘piggy back’ on the huge body of effectiveness research emanating from the UK’s National Institute for Health and Clinical Excellence.
(NICE), the US Agency for Healthcare Research and Quality (AHRQ), and similar bodies. By basing much of their work on such ‘pre-digested’ information, NHC would minimise the need for de novo primary data-level analyses—a considerable operational efficiency. NHC might also initiate discussions with appropriate people at NICE and AHRQ (etc.) to obtain information about which indications for which services have been identified as likely candidates for new investment or disinvestment.

After arriving at tentative conclusions based on these assessments, NHC would consult with relevant medical experts and patient groups within New Zealand to determine the perceived applicability and validity of these conclusions here. NHC might constitute ‘professional advisory groups’ for each clinical area to provide advice. Public consultation might best be coordinated through patient advocacy groups. Only after consultation would NHC make its final priority determinations.

Although the majority of NHC’s work programme would likely be grounded in existing overseas analyses, as just described, the DHBs and Minister of Health, as NHC’s principal clients, would be able to nominate additional services for priority assessment by NHC. These services would often be DHB-specific programmes designed to address regional and local needs (e.g., transportation to major treatment centres for patients in rural areas).

**Role of clinicians**

The Cabinet Paper observes that “clinician acceptance of the decision-making process is a key determinant of whether decisions are actually put into practice…Early and strong links with clinical leaders and DHB managers will therefore be important to NHC’s success” (sec 28). Indeed, much will depend on the reaction of the medical profession to the prioritisation process.

How are doctors likely to respond to requests for assistance in identifying opportunities for new investment and disinvestment? The MRG report gently criticised doctors over their historical reluctance to participate in making difficult allocation decisions, quoting the New Zealand Medical Council’s injunction that doctors “have a responsibility to the community at large to foster the proper use of resources and must balance their duty of care to each patient with their duty of care to the population.”

Doctors’ ability and willingness to balance these competing duties will be tested during any prioritisation process that will inevitably result in some people missing out on potentially beneficial services. Similar considerations applied during the initial development of clinical priority access criteria (CPAC) for use in booking systems in the mid-1990s. In that context, doctors recognised that the prevailing waiting lists were unfair and inefficient, and generally accepted the rationale for the CPAC approach, e.g. greater fairness and transparency. One hopes and indeed expects that members of the medical profession would take a similar view within the broader prioritisation context. Early involvement, perhaps through one or more professional advisory groups, would facilitate doctors’ acceptance of (and contribution to) the prioritisation process.
Information requirements

Assessment and prioritisation of health services cannot be properly accomplished without adequate data on the benefits and harms (e.g. side effects) associated with those services. Unfortunately, such information is commonly lacking, especially for long-term outcomes in real-world settings. This is especially true for medical and surgical treatments, but information on the outcomes of pharmaceuticals is also largely unavailable outside the focused clinical parameters found in RCTs, which typically exclude whole categories of patients based on age, gender, comorbidity, and other factors.

Fortunately, New Zealand is in an excellent position to obtain large quantities of real-world outcome data by linking across multiple health databases (e.g. Cancer Registry, National Minimum Data Set for hospitalisations, pharmaceutical data, mortality). The now-widespread use of unique National Health Index (NHI) numbers permits individual patients to be identified across databases. Amongst other initiatives, the Ministry of Health is amalgamating NHI-linked data into a seamless researchable database called Health Tracker, which already contains more than 98% of the New Zealand population.

NHC should play a major role in helping to ensure that these databases fulfill their potential as an indispensable resource for gaining information on the outcomes associated with health services. NHC and MOH should coordinate closely over the use of this resource for prioritisation purposes.

How should NHC decisions influence DHBs?

The question of how NHC’s determinations should constrain DHBs is perhaps the most important and difficult design feature of the envisioned prioritisation programme. As noted in the Cabinet Paper, positive coverage decisions made by NICE in the UK must, by law, be funded through the NHS, even if there is no money in the budget to pay for them. This tenet has at times put a substantial strain on the local funding authorities.

At the other extreme, New Zealand’s (now-defunct) process for evaluating new medical technologies, Service Planning and New Health Innovation Assessment (SPNIA), had no authority to require DHBs to provide services deemed cost-effective (though there were very few of these), nor to forbid DHBs from purchasing services deemed non-cost-effective. For this reason (amongst others) SPNIA had relatively little impact on funding policies and indeed was not concerned with prioritisation per se.

The challenge, therefore, is to create a role for NHC that will, on the one hand, give their decisions real ‘bite’—that is, decisions that cannot to be easily ignored as simply another piece of advice, nor readily circumvented by governments under political pressure. As noted in the Cabinet Paper, such an approach “risks being much like the current process and lacks a discrete budget constraint”.16

On the other hand, NHC’s decisions must not be divorced from DHB budgets, as noted above, nor should they pre-empt local decision autonomy, a meaningful measure of which is required under the DHB model (as opposed to the centralised Health Funding Authority model of 1997–2000).
Another major consideration in designing an implementation plan for NHC’s decisions is that Ministers of Health typically wish to maintain a degree of separation from lower-level decision-making about service provision. As Mr Ryall noted in the Cabinet Paper, an incorrectly designed process would carry the “risk” of the Minister becoming “directly [involved] in detailed and potentially sensitive decisions…[including] establishing the work programme, which may also be contentious.”

Disinvestment decisions, i.e. to reduce or eliminate funding for currently provided interventions, including tests, treatments, and facilities, are particularly contentious and will almost always trigger negative reactions from affected constituents. An instructive example can be found in of the Ministry of Health’s effort to stop routine paediatric screening for amblyopia (lazy eye) and for glue ear, based on overseas analyses and lack of evidence of effectiveness.

The controversy engendered by this attempt made it impossible for MOH to defund these services without explicit approval from Cabinet, which was eventually obtained. Cabinet has thus in effect set a precedent as being the court of final appeal for controversial potential disinvestments, at least when made at a national level. As such, ministers’ desire to maintain distance from the nitty-gritty of decision-making must be reconciled with the ultimate control they must maintain over such decisions as elected representatives.

How might the above considerations be translated into a way forward for NHC?

**A proposed modus operandi**

The following proposal is put forward as an example of an approach that takes the above considerations into account. Clearly, alternative models might also be developed. Specifically, I propose that the ‘strengthened’ NHC develop a portfolio of potential investments and disinvestments using what might be called a ‘traffic light’ approach.

A ‘Green List’ would contain new investments (new tests and treatments or expanded use of existing ones) deemed sufficiently cost-effective to merit high priority for funding if money is available.

An ‘Amber List’ would contain indications for services that, after assessment, NHC deemed to be of marginal value. DHBs could select amongst amber-list services for disinvestment, if needed to free up resources.

Finally, a ‘Red List’ would describe indications for services that NHC determined were likely to result in zero or negative net benefit (e.g. due to serious side effects or high false positive rates). Funding for these could be safely curtailed by all DHBs.

All three lists would mostly be denominated in terms of defined kinds of patients (indications for treatment or non-treatment), since most services provide benefit (or harm) to some but not all patients in whom they are currently used, or would be used. Importantly, the costs entailed by services on the Green List would roughly balance those on the Amber and Red Lists. Pharmaceutical products might be incorporated into the lists at some point, but PHARMAC would continue to operate independently for the foreseeable future.
The NHC’s three lists would be presented to the Minister of Health for consideration and, on behalf of Cabinet, possible approval. At least three possible approaches could be taken at this point, varying in the degree to which Cabinet explicitly endorses the lists.

The first approach, entailing the highest level of affirmation, would be modelled after the recently passed US health reform bill, which created a new Independent Medicare Advisory Board (IMAB) “to reduce the per-capita rate of growth in Medicare spending”.

If and when the Chief Actuary of the Centers for Medicare and Medicaid Services determines that the projected per capita growth rate for Medicare exceeds the target growth rate, IMAB must submit a proposal to cut costs sufficiently to bring the growth rate back in line. The Secretary of Health and Human Services must then implement that proposal in its entirety unless Congress replaces those recommendations with its own legislation that would cut Medicare spending to the same level (an unlikely proposition). But the Congress is forbidden from taking any action “that would repeal or otherwise change the recommendations of the Board”. This provision is designed to guard against lobbying for piecemeal changes, as occurs when services are singly targeted for reduction. A similar provision was used successfully to close hundreds of unneeded military bases in the US after it proved impossible to close them one at a time due to political considerations (e.g. employment effects).

If such an approach were to be used in the New Zealand health setting, Cabinet would either accept or reject NHC’s proposed lists in toto. Rejection of the lists would result in maintenance of the status quo with respect to DHB decision-making, while endorsement would effectively pre-authorise the disinvestments contained on the Amber and Red Lists.

A second possible approach would permit Cabinet to make modifications to the list prior to endorsement. Cabinet might prefer to retain this ability, although doing so would potentially expose them to pressure to add services to the Green List or to remove services from the Amber or Red Lists. In this respect the NHC would be like PHARMAC – difficult but not impossible to overrule. Finally, Cabinet could take a hands-off approach, merely expecting that DHBs’ investments and disinvestments decisions would be selected from the lists (as opposed to requiring that such selections be made from the lists, as on the first two approaches). On this third approach, DHBs would be able to go ‘off-list’ if they thought NHC had got something wrong or if they (the DHBs) had other priorities. In such cases, the Minister would likely request that DHBs explain their actions. Where disagreements persisted, the Minister might need to intervene.

**Fixed budgets outside pharmaceuticals?**

As noted above (first quotation in this paper), Mr Ryall accepts MRG’s conclusion that PHARMAC’s success in managing community pharmaceuticals might be relevant or applicable to a broader range of technologies and interventions.
MRG recommended that, in the first instance, PHARMAC be enlisted to assess and prioritise medical devices:

Outside pharmaceuticals, however, the current mechanisms for assessing the effectiveness and relative priority of health interventions are not as well developed. Strengthening these mechanisms will help improve the value and control the costs of improvements in health technology. In particular, the MRG considers it both possible and desirable to develop a PHARMAC-like process for assessing the cost-effectiveness of medical devices and prioritising them for public funding. (p.27; sec 68).

But what does a “PHARMAC-like process” mean, exactly? No doubt analytic rigour, including careful consideration of costs and effectiveness, is part of what is intended, but these characteristics are not unique to PHARMAC. PHARMAC’s success has largely been due to its contractual and operational tactics, including widespread use of generics and reference pricing, within the context of a fixed budget. Although similar contractual tactics might be difficult to apply more widely in extra-pharmaceutical domains, fixed budgets might have wider applicability.

The Minister cautiously raised this idea in the Cabinet Paper, for example suggesting that prioritisation of new technology might incorporate “methods and procedures for informing decisions and influencing behaviour including perhaps a budget constraint”. 21 In addition, “One option is to establish a PHARMAC-style notional budget for new technology and interventions, with DHBs agreeing to the level of the budget” (“notional” emphasised in the original) and “The creation of PHARMAC-like budget arrangements can be done in a way which places the Minister at arms length from the decisions”.

On the other hand, Mr Ryall notes that fixed budgets applied to all new medical technologies and interventions could pose “significant risks” because “the costs (and cost-effectiveness) of implementing new technology depend not only on the direct costs of the ‘kit’ itself, but also on complementary workforce and organisational costs”. 22

Perhaps the idea of trialling a fixed budget for medical devices would be a reasonable way to start, particularly if these were restricted to implanted devices (e.g., coronary stents, orthopaedic prostheses, certain cancer treatments). Ideally, a national device registry would be developed to obtain information on the benefits and harms caused by these devices in long-term, real-world settings. (A similar national registry is under consideration in the United States. 23 PHARMAC would be a logical candidate for assessing and prioritising devices within a fixed budget, and indeed they have already been asked to consider some devices, though not in the context of a fixed budget.

In any case, PHARMAC-style operational methods would presumably be implemented to the extent possible, including the institution of reference pricing, where appropriate. This might include a policy in which devices were paid at the same rate as medical therapy, unless sufficient evidence demonstrated that substantial additional benefit was expected from the device. These methods would be largely aimed at obtaining price reductions, as with pharmaceuticals.

If a fixed budget for devices should prove successful, the concept might be expanded to other areas, including certain diagnostics (e.g. genetic testing and some diagnostic imaging). Expansion of the policy to broader domains, such as cancer treatments or heart surgery, while seemingly far-fetched, might also be tried some day.
The above ideas are meant to suggest a possible way forward towards the next phase of healthcare prioritisation in New Zealand. I hope these suggestions will encourage renewed discussion on this vital topic.

**Competing interests:** None.

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**References:**

2. Ibid, Sec 12
4. Cabinet paper, sec 2
5. MRG report: p.29 sec. 72
6. Cabinet Paper, Sec 13
7. Ibid, Sec 34
12. Cabinet paper, sec 23-24
13. [www.nice.org.uk](http://www.nice.org.uk)
15. MRG report, p.19.
16. Cabinet Paper, sec 22
17. Ibid, Sec 29
20. [http://www.globalsecurity.org/military/ facility/brac.htm](http://www.globalsecurity.org/military/facility/brac.htm)
21. Cabinet paper, sec 13
22. Ibid, sec 21
Love bites—an unusual cause of blunt internal carotid artery injury
Teddy Y Wu, Jonathon Hsiao, Edward H Wong

We describe an unusual case of blunt neck trauma leading to internal carotid artery (ICA) thrombosis and subsequent cerebral ischaemic infarct in a 44-year-old Māori woman.

Case report

A 44-year-old Māori woman presented to the Emergency Department 24 hours after developing sudden onset of left upper limb monoparesis. The weakness was initially mild and occurred while the patient was watching television. It had progressed to moderate weakness with functional impairment precipitating the admission.

On presentation normal vital signs and a Glasgow Coma Scale (GCS) of 15/15 were recorded. Neurological examination revealed moderate upper motor neurone weakness in left upper limb. The remaining examination was normal. She was in sinus rhythm with clinically normal heart sounds.

A small vertical bruise was noted in the right anterior neck, superficial to the upper third of the sternocleidomastoid muscle. This was attributed to a love bite with the minor trauma occurring several days prior to the onset of neurological symptoms.

The patient has a history of systemic lupus erythematosis (SLE) controlled with combination of steroids and methotrexate. She smokes tobacco with occasional use of marijuana.

She was admitted to hospital and treated for acute ischaemic stroke. A non-contrast computer tomography (CT) of her brain was normal. Carotid duplex Doppler revealed an echogenic material thought to be thrombus in the right ICA causing a 65 to 70% luminal stenosis (Figures 1a and 1b). CT angiography of her cervical vessels confirmed a partially occlusive luminal thrombus in the right proximal ICA without arterial dissection (Figure 2a).

She was commenced on intravenous heparin and a follow up repeat CT angiography seven days later revealed significant reduction of the thrombus size (Figure 2b). The patient’s neurological symptoms resolved during her admission.

Warfarin was commenced with a target international normalised ratio (INR) of 2 to 3 before a thrombophilia screen was performed. At 1 month follow-up she has remained free of neurological sequelae. She is to continue warfarin for a total of 3 months.
Discussion

Blunt carotid artery injury with subsequent thrombosis and stroke is considered a rare phenomenon. It was first described by Verneuil in 1872 but remains an uncommon diagnosis even in the setting of trauma.¹

Abbreviations: ECA: External carotid artery; ICA: Internal carotid artery; CCA: Common carotid artery.
Recent case series suggested an overall incidence of up to 1% in blunt trauma victims. Majority of patients in case series have carotid injuries resulting from rapid deceleration with neck hyper-extension/flexion, predominately caused by motor vehicle accidents. This causes bony compression of carotid artery; other mechanisms of injury are intra-oral trauma, direct blows and basal skull fracture. The injury results in traction on carotid artery leading to tearing of intima or media with platelet aggregation, thrombosis and cerebral embolisation.

Diagnosis requires a high index of suspicion as there is usually a latency from the initial trauma to onset of neurological deficit. Over 90% of patients present with symptoms at least greater than 1 hour from trauma and over a third with a delay of 24 hours or more. Diagnosis is often delayed due to absence of initial neurology or lack of superficial signs of injury. The delay in onset of neurological symptoms is thought to be due to progressive thrombosis causing hypoperfusion or subsequent embolisation.

Blunt carotid artery injury should be suspected in the following clinical circumstances: neurological examination incompatible with CT findings; physical signs of anterior neck injury; development of neurological deficit after hospital admission; presence of Horner’s Syndrome.

CT angiography or Magnetic Resonance angiography are diagnostic tools of choice, as they are non-invasive and allow assessment of the wall and lumen of the vessel.

Treatment options include surgical revascularisation, anticoagulation or supportive medical management. Earlier reports advocated surgical revascularisation but recent research have lent towards conservative management with anticoagulation, particularly when mild to moderate neurological deficits are present. Patients treated with anticoagulation seem to also achieve good clinical outcome.

Earlier reports indicate a mortality rate of up to 30% but more recently rate as low as 5% has been observed. This is likely due to earlier diagnosis with advent of non-invasive imaging such as MRI or CT angiography leading to earlier intervention.

Our patient suffered an uncommon mode of blunt trauma to the neck and internal carotid artery following a love bite. There was no evidence of arterial dissection but most likely there was intimal injury from the compression of the internal carotid artery with subsequent thrombosis.

**Conclusion**

We report on an interesting case of blunt carotid artery trauma caused by a love bite. Blunt carotid artery trauma can lead to arterial injury, thrombosis and cerebral embolisation. It is a rare phenomenon and diagnosis requires a high index of suspicion. Current literature suggests a conservative approach to treatment with anticoagulation. Most patients achieve a favourable outcome especially when initial neurology was non-disabling.

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References:
A case of oesophageal varices and portal hypertension in an HIV-positive patient with no evidence of cirrhosis

Sara Temelkovski, James Irwin, Jim Brooker

Abstract

We present a case of portal hypertension and variceal bleeding in the absence of cirrhosis, in an HIV-positive patient on long-term antiretroviral treatment with didanosine. We believe this to be the first such case identified in New Zealand (NZ).

Non-cirrhotic portal hypertension (NCPH) is a condition of elevated portal venous pressure in the absence of cirrhosis. NCPH was initially described in the Indian subcontinent in association with anaemia and congestive splenomegaly. It was initially referred to as ‘idiopathic portal hypertension’ or ‘hepatoportal sclerosis’. A mechanism of thrombophlebitis as a result of recurrent gastrointestinal infection and repeated embolisation into the intrahepatic and extrahepatic portal venous circulation has been postulated to lead to increased portal venous pressure.

In the developed world, NCPH is much less common. It has recently gained attention in the HIV-positive population following the publication of a number of reports linking antiretroviral exposure to the development of NCPH. It has not previously been described in NZ.

An estimated 1230 HIV-infected individuals were receiving medical care in NZ in 2007, 0.03% of the general population. Exposure to patients with complications of HIV and treatment is therefore low amongst non-specialist medical services.

Case report

A 49-year-old man was brought in by ambulance to this centre following sudden onset nausea and multiple bouts of vomiting of fresh blood. He had a 3-week history of intermittent abdominal pain prior to this event. He had no previous gastric symptoms or NSAID use and drank alcohol occasionally. He had no previous liver dysfunction or infection with hepatitis A, B or C.

He was diagnosed with HIV in 1996 at which time he was asymptomatic with a CD4 count of less than 200×10^6/L. Antiretroviral therapy (ART) was commenced in early 1999. He had been treated initially with 3 years of stavudine 40 mg bd, abacavir 300 mg bd and nelfinavir 1250 mg bd. This was changed in 2002 to a regimen of didanosine 250 mg po od, efavirenz 600 mg od and tenofovir 300 mg od. His disease at time of this presentation was stable with an undetectable HIV viral load and a CD4 count of 290×10^6/L. He was believed to be adherent to the antiretroviral regimen as detailed above.

On examination he was pale, thin and afebrile. He had mild epigastric tenderness, but no peritonism. There was no ascites or encephalopathy. Rectal examination revealed dark stools with no blood or melaena.
The haemoglobin on admission was 115 g/L which dropped to 90 g/L the following day. Further blood tests revealed — bilirubin 9 umol/L (2–22), ALP 71 g/L (40–110), ALT 26 U/L (0–45), GGT 135 U/L (0–60), INR 1.1, and albumin 36 g/L (38–52). Blood tests excluded the presence of hepatitis A, B, and C. Alpha-1-antitrypsin, iron studies, ANA and smooth muscle antibodies, serum immunoglobulins and ceruloplasmin were all normal.

At endoscopy, four large varices were noted protruding to half of the lumen with a platelet plug visible at an obvious recent bleeding site (Figure 1). A moderate amount of altered transported blood was found in the stomach. Six variceal bands were applied. Prominent fundal folds were noted raising the possibility of fundal varices. No obvious portal gastropathy was seen.

**Figure 1. Endoscopic view of oesophagus with four large varices and a platelet plug indicating the site of recent haemorrhage**

An ultrasound scan of the liver demonstrated slightly coarse echotexture but no focal hepatic parenchymal pathology was seen. There was no evidence of macronodular change and normal anterograde flow was seen in the portal and hepatic veins. Portal
venous flow was measured at 10 cm/second, which is within the normal range. The spleen was slightly prominent at 14 cm in length. No perisplenic varices were seen.

A Fibroscan showed a transient elasticity of 5.9 kPa (IQR 1.0 kPa, 10/10 recordings valid), consistent with minimal or no fibrosis. He declined to have a liver biopsy.

The patient's ART was changed to tenofovir 300 mg od, efavirenz 600 mg od and abacavir 600 mg od, and propranolol 40 mg bd was commenced as secondary prophylaxis of variceal haemorrhage. Elective oesophageal banding was performed on a further three occasions during the subsequent 12 months with consequent reduction in varix size. He has not suffered any further episodes of bleeding.

Discussion

In patients who are HIV-positive, liver disease is usually due to concurrent chronic viral hepatitis, alcohol abuse or non-alcoholic steatohepatitis.

NCPH is a relatively newly described condition in patients who are HIV-positive and has potentially life-threatening sequelae, particularly variceal haemorrhage. The pathogenesis of this condition is not well understood. In the HIV-positive population, an increased incidence of NCPH has been found in those exposed through anal intercourse.

It has been hypothesised that transfer of microbes from the gastrointestinal tract to the portal circulation and the resulting septic microthrombophlebitis could account for the development of NCPH in this group. In the Indian subcontinent, ‘noncirrhotic portal fibrosis’ (NCPF) has been described, and accounts for approximately a quarter of all variceal bleeding seen within that region. Similarly, the most widely proposed mechanism in the development of NCPF is fibrosis due to recurrent microembolism in the portal circulation secondary to abdominal sepsis.

NCPH has been defined in a recent case-control study as the presence of endoscopically documented oesophageal varices or an hepatic venous pressure gradient >10 mmHg, no cirrhosis on liver biopsy, and the absence of alternative aetiologies (hepatitis B, C, alcohol excess, haemochromatosis, Wilson’s disease, alpha 1 antitrypsin deficiency, autoimmune hepatitis, non alcoholic fatty liver disease or hepatotoxic drugs).

Liver biopsy in patients with NCPH may reveal a variety of histologic lesions, though these are not consistently present. They include periportal fibrosis, perisinusoidal fibrosis, and nodular regenerative hyperplasia. These histological features are consistent with a pathophysiological mechanism of presinusoidal fibrosis leading to obstructive portal venopathy and intrahepatic portal hypertension. By definition liver cirrhosis is absent on biopsy, and the clinical sequelae of variceal haemorrhage and ascites are a consequence of portal hypertension. However liver failure leading to death or liver transplantation has been described in some cases of NCPH.

Prognosis for patients with antiretroviral associated NCPH has not been clearly described. In a published cohort 4/15 patients died of complications of liver disease, either variceal haemorrhage or liver failure, over an average follow-up period of 12 years. In addition NCPH is a rare but recognised cause of decompensated liver disease
requiring liver transplantation. Ongoing monitoring of patients with antiretroviral associated NCPH for these complications is therefore warranted.

Although our patient declined liver biopsy, the Fibroscan result excluded hepatic fibrosis or cirrhosis. Fibroscan is a well-validated non-invasive method for detecting hepatic fibrosis or cirrhosis. A recent meta-analysis of 50 studies examining the performance of Fibroscan showed that cirrhosis could be excluded with a transient elasticity (TE) of less than 13.01 kPa, and significant hepatic fibrosis (equivalent to a metavir score of F2 or greater on liver biopsy) with a TE less than 7.65 kPa.

Didanosine has recently been implicated in the development of NCPH. Its use in NZ has declined due to well-documented toxicity issues such as lipodystrophy, pancreatitis and lactic acidosis. Exposure to any ART medication appears to increase the risk of developing NCPH, and this risk appears to be cumulative. ART commenced as mono or dual therapy increases the risk when compared to three or more drugs. When individual antiretrovirals were studied, didanosine stood out as a risk factor for development of NCPH, with an odds ratio of 3.44.

Our report describes an HIV-positive patient treated with didanosine for 8 years. He presented with variceal haemorrhage secondary to portal hypertension, had no evidence of liver fibrosis or cirrhosis on Fibroscan and had a negative screen for causes of chronic liver disease. This is the first report of didanosine associated NCPH identified in NZ.

The population of individuals infected with HIV in NZ remains small and current ART regimes are highly effective. Nevertheless, it is important that clinicians remain vigilant for unusual complications of the disease and its therapy.

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Acknowledgement: We thank Dr Graham Mills (Consultant Physician in General Medicine and Infectious Diseases, Waikato Hospital).

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References:


A medical emergency following chicken pox

Tilak de Almeida, Charaka Goonasekera, Jon Skinner, Fraser Maxwell

A 2½-year-old girl presented to our paediatric unit with fever and shortness of breath. She was febrile and ill-looking. She was short of breath with an elevated respiratory rate of 48 breaths per minute. She had an extensive healing crusted rash of chicken pox on her torso. She had a regular heart rate of 160 beats per minute. The pulse was of normal volume.

On auscultation no pericardial rub or murmur was detected. Air entry was reduced on the left base laterally. The liver edge extended to 6 cm below the margin of the right rib cage.

Diagnostic work up showed white cell count of 26,000 cells/cmm with a left shift, ESR 75. Blood culture showed no growth. Troponin level was normal. An electrocardiogram demonstrated widespread upwardly concave ST segment elevation. augmentin 50 mg/kg and aciclovir 10 mg/kg were initiated intravenously. Flucloxacillin was added later. She had maintenance fluid along with supplemental oxygen via nasal cannulae. Chest radiograph is shown below.

![Chest radiograph](image)

The chest radiograph shows an enlarged cardiac silhouette with a cardiothoracic ratio of 67/134 cm. Subsequent echocardiogram showed a global 1.5 cm thick circumferential collection of fluid in the pericardial sac.
Our patient was transferred to a specialised cardiac unit, where 200 ml of pericardial fluid aspirated under echocardiographic guidance. Culture of the fluid gave a pure growth of *Staphylococcal aureus*. She was given flucloxacillin 50 mg/kg intravenously for 6 weeks via a peripherally inserted central venous catheter. A pigtail catheter kept in the pericardial sac produced another 50 ml of fluid giving a total of 250 ml. She remained tachycardic with persisting hepatomegaly and a further echocardiogram revealed persisting pericardial collection, more gelatinous, along with significant diastolic dysfunction suggesting constrictive physiology.

Anterior pericardectomy was performed 2 weeks after the initial pericardial tap. Perioperatively a significant amount of fibro-purulent material was evacuated and the chest was irrigated with antibiotic solution. Echocardiography after this revealed a significant improvement in diastolic function along with a drop in heart rate.

Her subsequent recovery was uneventful and 1 month post discharge echocardiogram has been completely normal.

**Discussion**

Varicella is a vaccine-preventable common infectious disease, usually benign in children. Occasionally it may be complicated by cardiac involvement. Other possible complications include cellulitis, necrotising fasciitis, septicaemia, encephalitis, arthritis, pancreatitis, cerebellar ataxia, osteomyelitis, and extensive pneumonia needing ventilatory support.

Complications associated with bacterial super infection (*Streptococcus pyogenes* and *Staphylococcus aureus*) is the most common reason for hospitalisation of children with chicken pox.1,2 Possible cardiac involvement ranges from subclinical ECG changes to endocarditis, myocarditis, fulminant cardiac failure, pericarditis with or without tamponade.

Respiratory distress following chicken pox indicates the need for radiological investigation. If the cardiac silhouette is enlarged it is important to consider a pericardial collection particularly when associated with characteristic electrocardiographic changes.

Pericardial effusion is a potential medical emergency which can be treated promptly by initial needle aspiration under echocardiographic guidance. Delay in diagnosis and treatment could be fatal.

If the fluid is a clear transudate and is sterile prolonged antibiotic treatment may not be necessary.

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References:


Aortic aneurysm in a girl with Takayasu’s arteritis
Selim Doganay, Ercan Kocakoc, Yasar Sen

Takayasu’s arteritis is a large vessel vasculitis of unknown aetiology that mainly affects the aorta and its major branches, pulmonary arteries and coronary arteries. The disease is a form of panarteritis, beginning with inflammation of the adventitia with subsequent involvement of the media and intima. This results in luminal abnormalities like stenosis, occlusion, dilatation and aneurysm formation of the involved vessels.

Figure 1. 3D contrast-enhanced MR angiography oblique sagittal image shows multiple aneurysmatic dilatations of thoracoabdominal aorta (arrows)

Figure 2. Contrast-enhanced MR angiography axial image shows severe stenosis (thin arrow) and poststenotic dilatation on the right main renal artery (thick arrow)
A 15-year-old girl was admitted with a history of mild abdominal pain and back ache for a year. Blood pressure was 100/70 mmHg in the left arm, 80/60 mmHg in the right arm, and 130/90 mmHg in the both legs. On the physical examination there was bruit on the abdomen. Three-dimensional contrast-enhanced MR angiography showed narrow segments and accompanied multiple aneurysmatic dilatations of thoracoabdominal aorta (Figure 1) and severe stenosis and poststenotic dilatation on the right main renal artery (Figure 2). Additionally, there was tortuosity, irregularity, and thickening of aortic wall.

Based on these clinical and imaging findings, she was diagnosed with Takayasu’s arteritis.

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**References:**

The prevention of sepsis in compound fractures


As the main object in the treatment of compound fractures is to prevent sepsis, it is necessary to employ some antiseptic sufficiently potent to kill micro-organisms, and the same time not to destroy the vitality of the tissues. Most of the antiseptics recommended in text books do not fulfil both of these conditions.

During the last year I have treated seven cases of compound fracture with 3% Iodine in Rectified Spirit, and the results have been most gratifying. Some of the cases were seen immediately after their occurrence, others not for 24 hours afterwards. The skin surrounding the wound was first painted with the Iodine preparation, and if necessary the wound enlarged. Foreign matter was removed where possible by syringing with weak Biniodide solution; then the cavity syringed with 3% Iodine and plugged with sterilized gauze soaked in the Iodine.

The patient usually complains of a smarting sensation for a few seconds, but this rapidly passes off. If the patient's temperature did not rise above 100 on the day following, the plugging was left undisturbed for four days, when it was removed and the wound re-plugged with fresh gauze soaked in Iodine. This was repeated every second or third day till the wound healed.

The Iodine does not retard healing, but rather seems to favour the formation of healthy granulation tissue. Not one of the seven cases so treated showed any signs of sepsis whatever, nor did any one of the patients show any signs of Iodine absorption, although some of the wound cavities were large, and were freely treated with Iodine.

So that besides being a powerful antiseptic, it appears to be safe and non toxic. Two of the cases deserve special mention. One a girl with compound fracture of both bones of right forearm caused through a fall at a skating rink; the wound was very dirty with dust from the rink floor. The wound was enlarged and then treated as described above—no sepsis followed, and the arm was quite healed in 16 days.

The other case was a compound fracture of right fibula and fifth metatarsal and a dislocation of the astragalus forward; the soft parts round the ankle joint were very much lacerated. The patient did not come under treatment for 24 hours after the accident, still the foot never suppurated, and the wound was healed in 26 days.
Prediction of coronary artery disease in the community

Chest pain is a common presenting symptom. This study proposes a predictive model for those patients who present to their practitioner with anterior chest pain. It includes 5 determinants (age/sex, known vascular disease, patient assumes pain is of cardiac origin, pain is worse during exercise, and pain is not reproducible by palpation). The age cut-off is 55 years or older for men and 65 years or older for women. Each determinant carries a score of 1 point.

After studying 1249 patients they conclude that a score of 3–5 is consistent with coronary artery disease and a score of 2 or less helps to rule out coronary artery disease. In a parallel validation study of 672 patients, the model was found to be sound—i.e. the scores matched the outcome. Interesting. Intuitively one would think that the quality and radiation of the pain would have been more useful.

CMAJ 2010;182:1295–300.

Antipsychotics and the risk of venous thromboembolism (VTE)

Apparently there are many case reports and small studies that suggest that there is an increased risk of VTE in those who take antipsychotics drugs. In this population-based case-control study, over 25,000 people with VTE have been matched with nearly 90,000 control subjects. And the results demonstrate that the use of antipsychotic drugs is associated with an increased risk of VTE, which is more marked among new users and those prescribed atypical antipsychotic drugs.

The effect was marked in the older age group—the estimated number of extra cases of VTE per 10,000 patients treated over 1 year was 4 (3 to 5) in patients of all ages and 10 (7 to 13) for patients aged 65 and over.

So the absolute risk in terms of patient numbers is small, however VTE is a potentially dangerous problem. The benefit and risk need to be considered carefully before such treatments are initiated.

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More about direct-to-consumer gene tests

We have earlier (NZMJ 15/2/08) abstracted information on the availability of genome testing “over the counter” in the USA and the problems it may cause. The US Government Accountability Office (GAO) has entered the field and reached some fairly predictable conclusions. The GAO purchased tests from 4 prominent companies and compared the results they received for 15 common diseases, including Alzheimer disease, breast cancer, myocardial infarction, obesity, and restless leg syndrome.

They found that results for identical DNA samples varied between companies and, in some cases, conflicted with the medical status or family history of the individual who
supplied the DNA. Furthermore a senior GAO officer informed the US House of
Representatives that “we found that 10 of the 15 companies engaged in some form of
fraudulent, deceptive, or otherwise questionable marketing practices.”

As we suspected.

Monoclonal antibody treatment for severe osteoarthritis of the knee?

Sooner or later someone would suggest that osteoarthritis could be treated with a
biological and this paper explores this topic: tanezumab is a humanized IgG2
monoclonal antibody directed against nerve growth factor that blocks the interaction
of nerve growth factor with its receptors. Obviously such an agent might alleviate
pain and the question addressed by these researchers are does it do so in knee
osteoarthritis and is it safe? The patients in this study had very painful knees with
inadequate relief from conventional treatments. The researchers randomly assigned
450 patients with osteoarthritis of the knee to receive intravenous tanezumab
(administered at a dose of 10, 25, 50, 100, or 200 µg per kilogram of body weight) or
placebo on days 1 and 56.

Mean reduction of pain ranged between 45–62% with various doses of tanezumab
compared with 22% in the placebo arm (p<0.001). Adverse effects rates were similar
in both cohorts , but peripheral sensory symptoms were commoner with tanezumab.

Interesting. However I note, buried in the discussion, that the FDA have called a halt
to such trials as this as there is a suspicion that rapid progression of arthritis with bone
necrosis many occur with this biological therapy.

Prosthetic joint infection and interleukin-6

Signs and symptoms of infection such as fever, chills, or elevated peripheral white
blood-cell count are often lacking in patients with prosthetic joint infection. More
specific clinical signs such as fever or the presence of a sinus tract are often absent,
making clinical variables insensitive.

This paper from the Mayo Clinic offers a meta-analysis of various systemic
inflammatory markers that have been used in the situation where sepsis is suspected
in a prosthctic hip or knee arthroplasty. Their database was derived from 30 studies
that included 3909 revision total hip or knee arthroplasties. In 1270 (32.5%), sepsis
was proven. The highest accuracy was found with interleukin-6, CRP (C-reactive
protein) was second best, followed by ESR (erythrocyte sedimentation rate) and
raised white blood cell count came last.

The results seem clear cut, but the authors suggest more study is required as the
interleukin-6 results were derived from only 3 studies.
Poorer mental health in many New Zealand smokers: national survey data from the ITC Project

There is international evidence that smoking and poorer mental health are associated.\textsuperscript{1–5} This association has also been studied in New Zealand (e.g., in longitudinal studies\textsuperscript{6–8}) with the most recent work indicating that smoking has a causal role in depressive symptoms.\textsuperscript{9} Furthermore, in this country it has been estimated that 33\% of all cigarettes are consumed by people with current mental disorders.\textsuperscript{10} We were able to further explore some aspects of the smoking and mental health issue in New Zealand as part of the International Tobacco Control Policy Evaluation Survey (ITC Project).

Methods—The ITC Project (NZ arm) surveyed a nationally representative sample of adult smokers (n=1376 in Wave 1 in 2007/8, n=923 in Wave 2 in 2008/9). This study derives its sample from the New Zealand Health Survey (NZHS) which is a national sample with boosted sampling of Māori, Pacific and Asian New Zealanders. We measured their mental health and alcohol use status using the SF-36, the Kessler-10 (K10), and the AUDIT. Also assessed were smoking-related beliefs and behaviours, including quit rates. Some comparisons were made with non-smoking participants in the NZHS. All results are weighted and adjusted for the complex sample design. Further details of the methods (including response rates, attrition and weighting processes) are available in online Methods Reports\textsuperscript{11-13} and related publications.\textsuperscript{14,15}

Results—In terms of overall mental health, smokers had significantly lower SF-36 (mental health) scores (i.e., poorer mental health status) than the general adult population (80.6, 95\%CI: 79.6–81.6; vs 82.2, 95\%CI: 81.9–82.6). Reporting ever having been diagnosed with a mental disorder was significantly more common for adult smokers than for non-smokers (at 20.3\%, 95\%CI: 17.4\% – 23.1\%; vs 11.5\%, 95\%CI: 10.8\%–12.2\%). Here the non-smoker comparison group was from the full NZHS sample and “mental disorders” were any in a list of eight items used in the NZHS.

Smokers also had a significantly higher prevalence of having “a moderate probability of anxiety or depressive disorder” (K10 score of 6–11) compared to the adult non-smoker population (20.3\% vs 13.6\%, see Figure). This was also so for having a “high to very high” (K10 of 12+) probability of these disorders at 9.7\% vs 5.3\% respectively.

There was a significantly higher prevalence of AUDIT scores in the hazardous alcohol use range among smokers (33.1\% vs 13.1\% in the adult non-smoker population for scores of $\geq$8). This was also the pattern for ever being diagnosed with a “drug-related disorder” (1.5\% vs 0.2\%).

Despite the above patterns there were no statistically significant differences in quitting intent and behaviours between smokers with higher K10 scores (6+) and other smokers. That is for plans to quit in the future (75.5\% vs 66.2\%), and having...
been quit for at least 30 days at the time of either survey (10.1% vs 8.1%) respectively.

Figure 1. Psychological distress as measured by the Kessler 10-item scale (K10) in this national sample of smokers compared to the adult non-smoker population of New Zealand

Discussion—The finding that smoking appears to be associated with poorer mental health is consistent with other international and New Zealand evidence (see the introductory paragraph above). Nevertheless, our analyses are somewhat simplistic in that we did not perform multivariate analyses that adjusted for a range of demographic and socio-demographic variables (due to resource constraints and limited access to the full NZHS dataset). There are also various limitations with the ITC surveys and the NZHS (e.g., around response rates and social desirability bias\(^1\)). Of course our findings are also limited by the largely cross-sectional nature of the results and so we can not expand on the previous New Zealand work around likely causal pathways, as per the excellent longitudinal research by others.\(^6\)\(^9\) Nevertheless, whatever the direction of causation involved, the apparent smoking and mental health association reiterates the importance of advancing population-level tobacco control to

* Moderate probability of an anxiety or depressive disorder.
** High to very high probability of an anxiety or depressive disorder.
both prevent smoking uptake and also to increase quitting rates by people at risk of, or with current, poor mental health.

Fortunately New Zealand may be entering a new phase of accelerated population-level tobacco control with the excellent recommendations of the Māori Affairs Select Committee.\textsuperscript{16} The Government also has many opportunities to progress population-level alcohol harm-reduction policies, as recommended by the Law Commission\textsuperscript{17} (some of which are about to be considered by politicians via the Select Committee Process).

Our specific finding that quitting intention and quitting behaviour does not appear to be associated with mental health status is encouraging. Indeed, the finding that smokers with mental disorders are motivated to quit is consistent with the findings in a recent review.\textsuperscript{18} Therefore, while intensifying population-level tobacco control interventions is the first priority, attention should also be given to ensuring that smoking cessation services are appropriately tailored to those with mental health needs, including those with excessive alcohol consumption. This could be considered in face-to-face contacts with health workers, telephone support services (e.g., the Quitline), but also in the design of web-based quitting services which may be a particularly cost-effective approach to providing smoking cessation support.\textsuperscript{19} This will be an important area for future development and evaluation of interventions, though it is reassuring that there is systematic review evidence that various smoking cessation interventions can work for those with mental health problems without jeopardising their mental state (e.g. for smokers with schizophrenia).\textsuperscript{20}

Nick Wilson\textsuperscript{1,*}; Deepa Weerasekera\textsuperscript{1}; Sunny Collings\textsuperscript{2}; Richard Edwards\textsuperscript{1}; Frederieke S van der Deen\textsuperscript{1}

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

Acknowledgements: The ITC Project (NZ) team thank: the interviewees who kindly contributed their time; the Health Research Council of New Zealand which has provided the funding (grant 06/453); and our other project partners (see: \url{http://www.wnmeds.ac.nz/itcproject.html}).

References:

5. Ameringer KJ, Leventhal AM. Applying the Tripartite Model of Anxiety and Depression to cigarette smoking: An integrative review. Nicotine Tob Res. 2010;[E-publication 29 October].
A response to the article “Task Manager: an innovative approach to improving hospital communication after hours”

The Task Manager (TM) system outlined in the article reports an efficient system for recording after hours requests and it appears to have been widely accepted by clinical staff. Reference to the Hospital at Night initiative implies that this requires a central coordinator role and a physical control centre. The authors further state, Middlemore Hospital has not gone down that route due to the number of staff required for such a role and TM provides visibility of tasks.

Since 2007, Christchurch Hospital has incrementally introduced the Hospital at Night model to the entire after-hours period, largely through the introduction of a Clinical Team Coordinator (CTC) role. One of the functions of the CTC role is to have a hospital wide view to ensure workload is evenly distributed through CTC coordination of tasks to ensure a timely response to patient care. This coordination does not occur with the CTCs based in a physical control centre. Rather, with the aid of technology, the CTCs play a mobile hands-on clinical support role for both RMOs and nursing staff. Christchurch Hospital is investigating TM as a support communication system for the CTCs, but such a system could never be seen to replace the proven value of the CTC role within our hospital to coordinate workload and foster teamwork.

TM requires after-hours House Officers to log on consistently, and manage their own workload, without the coordination that is provided in Christchurch which has nurtured teamwork and exposed the futility of working in silos that have disproportionate workloads.

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Roxanne McKerras
Clinical Team Coordinator
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References:


Wilfrid Christie Mills

21 January 1920 – 7 October 2010

Born at Bruntwood, Cambridge to dairy farming parents, Wilfrid started school at the age of 6 riding a horse without saddle, 3½ miles to school at Hautapu. His secondary schooling was at Hamilton High School, travelling by train. This was until 1934, but in 1937 the family moved into Hamilton township.

Earlier, from the country, in order to take part in rugby practice he took his bicycle on the train, to school, and later cycled home, some 20 kilometres. Wilfrid passed the matriculation examination, including Medical Preliminary, in 1936.

In 1937 he was appointed prefect, and played for the First XV, and the next year was captain of the First XV, and the boy Head Prefect—it was a co-educational school in those days.

In 1939 he went to Auckland University and passed Medical Intermediate, giving him entry to the Medical School in 1940, at Otago University.

With World War 2 on, Wilfrid and I, in our “holidays”, biked to and from the freezing works, working in the fellmongery at Horotiu. Wilfrid was trimming fleeces and I was throwing them up onto a belt where a “paint” was put on the skins overnight, and next day, upstairs, the fleece was just pushed off the skin. If it was getting a bit boring, one of us would call out “Come on Happy give us a song”. The response being the singer’s wonderful bass voice, on “Ol’ Man River”, or the like. That was “Happy Davidson” who was later to be known as the extremely successful Inia Te Wiata.

Wilfrid graduated MbChB (NZ) in 1944, having worked as an acting house-surgeon at Waikato Hospital for nearly all of that year, and continued his training until early 1947 when he went out into general practice in Hamilton, but continued at the Waikato Hospital, as a visiting anaesthetist.

The author of this obituary joined him in medical practice, and also became a visiting anaesthetist. We both used machines for anaesthesia with intubation and curarization. All earlier inhalation anaesthesia had been with chloroform and/or ether. I, later, also went to Britain, and trained as a physician.

In 1947 Wilfrid married Mary Jackson Dunbar of Wanganui, but now a registered nurse at Waikato Hospital. Mary was a wonderful wife and mother, and in 1951 they, and two young children, proceeded overseas to England, and in 1952 Wilfrid passed the Diploma of Anaesthesia. He then went to Edinburgh and Oxford in 1953, and was elected to the Fellowship of the Faculty of Anaesthetists of the Royal College of Surgeons, and later to the Fellowship of the Faculty of Anaesthetists of the Royal Australasian College of Surgeons.
During our years as House Surgeons at Waikato Hospital, Wilfrid and I saw a need for us to do general practice for several years before specializing, and neither of us has regretted doing that, as we were extremely busy in doing maternity as well as being visiting anaesthetists, in public and private.

On returning to New Zealand in 1953 Wilfrid resumed general practice and continued to be very busy both in public and in private as an anaesthetist. He had elected to stay in only part-time hospital practice at a time when senior posts were being much sought after in the larger hospitals, however in 1962 Wilfrid joined the full-time staff at Waikato Hospital, where his services were even more sought after and his technical skills, work ethic, and compassion were more and more evident.

Then in 1970 Wilfrid was appointed to Tauranga Hospital as Director of Anaesthesia. This move was a very happy one for him, something he never regretted, although it resulted in his working very long hours and carrying a very heavy workload, both in the operating theatres, and in the Intensive Care Unit and in pain management.

Top surgeons who worked with him there spoke of him as the right man in the right place at the right time. A leading surgeon, spoke of how Wilfrid led by precept and example, paving the way for a superb specialist and anaesthetic service. Wilfrid’s competence in intensive care was second to none as he showed how to appropriately care for the critically ill, often into the small hours.

At Wilfrid’s funeral, Dr Barry Partridge, a now retired surgeon, spoke of “Wilfrid as a role model, a mentor, and a friend. He had a deep faith that he expressed in the way that he practised anaesthesia for the benefit of all, beyond the call of duty. It is humanly impossible to audit and evaluate his contribution to us all, and to this community.”

Wilfrid was in his element in Tauranga, with his meticulous attention to detail, extraordinary devotion to duty, a very deep feeling of responsibility, and all this, often at a time, when other doctors in the same situation, would have demanded much more time out.

Wilfrid was always a keen gardener as was his wife, and they shared responsibilities in the flower garden, and Wilfrid always maintained an excellent vegetable garden. Family holidays were always very precious particularly with a caravan and with relatives and friends.

Throughout those busy years in Hamilton and Tauranga, he did his share of Committee work, such as the New Zealand Medical Association, Waikato Division; Junior Naturalist Society, PTA Hamilton Boy’s High School, and Hamilton High School Old Boy’s Assn, at different stages being Chairman of the three latter groups. Wilfrid was also a member of the Board of Governors of the Hamilton High Schools. He was an Elder of St-Andrew’s Presbyterian Church in Hamilton, then the Session of St Colomba in Tauranga. An Uncle Wilfrid had been a missionary in the Sudan. The Christie part of Wilfrid’s name was his mother’s maiden name, and Wilfrid, in later years, took a great deal of interest in family history and church history.

Wilfrid was 9 years of age, when his sole surviving sibling, Ruth, was born, and he was always to be her big brother, as also for Gordon and Betty, who sadly died at
relatively young ages. Gordon had been in our Practice, before training as an Ear Nose and Throat Specialist.

Wilfrid’s wife Mary was a remarkable woman, both as wife and Mother to their four children, yet was able also to do much good work in the community, in the church, and in charitable activities, until serious illness rendered her less able, and terminal illness caused her death in 2007.

Wilfrid's elder son John, is a GP, and the younger son, Ian, an architect, and the girls, Barbara married to a dairy farmer, and Anne is a tutor. There are seven surviving grandchildren, and four great grandchildren.

Wilfrid was himself by this time far from well, and those of us who attended his 90th birthday function early this year, knew that he was tired of life. There was a gradual decline over the next few months and his passing was peaceful.

To me, Wilfrid’s life was one of service to the community, to medicine, and to his loved and loving family. He was an extraordinarily accomplished anaesthetist in whom his family can take great pride.

Dr DJ (Jack) Gudex wrote this obituary.
William Henley Bird

30 March 1929 – 19 August 2010

William Henley Bird, a Christchurch General Practitioner, died at Windermere Hospital on 19 August 2010, aged 81.

Bill was born into a medical-oriented family. His father, William Anderson Bird, was a long-serving General Practitioner in Greymouth and his maternal uncle, Wilton Henley, an Auckland Physician and Medical Superintendent-in-Chief of the Auckland Hospital Board. Bill was the eldest of four boys, three who did medicine. John predeceased him in 2009, Barrie practiced in Timaru, now retired to Christchurch, and Chris the youngest was an international airline pilot who now lives in Queensland.

Bill attended Grey Main Primary School before entering St Andrew’s College as a boarder in 1943. He became Head of the house and Deputy Head of the College in 1948. He was an enthusiastic member of the College Pipe Band (as drum sergeant) an interest which persisted all his life. He was captain of the second XV and played for the school tennis eight.

He attended Canterbury University College before moving to Otago University where he graduated from Medical School in 1955. Two years as a house-surgeon at Christchurch Hospital followed before he bought Dr Doug Logan’s practice in Greymouth where he built up a large obstetrical practice as well as becoming a part-time physician on the staff of Grey Hospital.

In 1970 Bill and his family moved to Christchurch where he joined Dr Geoffrey Clarke in practice at Bishopdale. He sold the practice to Dr Erin Moran in 1992 and did locum work until his retirement in 1996.

He became a member of the College of General Practitioners in 1960 and a member of the RNZCGP in 1974. He was elected a Fellow of the College in 1987. During his years in General Practice he was appointed a Medical Officer for Medbury Preparatory School from 1979 and St Andrews College from 1986 holding these positions for 9 and 6 years respectively. During the 1980s he was a tutor in General Practice at the Christchurch School of Medicine.

In the early 1980s Bill developed an interest in acupuncture and attended a comprehensive course with Dr Ian Schneideman at Forest Glen, Queensland. He successfully incorporated this into his practice.

Bill met Ruth Hampton at Christchurch Hospital and they were married in 1959. They had four children Bill, Amanda, Nicholas and Andrew of whom he was enormously proud.
His interests were wide and varied and he never lost his love of the outdoors. Early family holidays were spent at Waikawa Bay and later at Golden Bay sailing and fishing. He built a Sunburst and as the family left home he spent many hours at Tata Beach in a Laser. His love of fly fishing learnt on the West Coast never left him and he eagerly awaited the opening of the High Country fishing season each November. Over the last 20 years visits to Wanaka gave him much pleasure.

On retirement he played golf with a group of friends and retained interest in the local Probus Club, his Masonic Lodge, U3A and the garden.

The diagnosis of Parkinson’s disease in 2006 deprived Bill of many of his activities and over the next few years he became increasingly disabled, necessitating his going into care at Windermere Hospital where he had been a Medical Officer during his General Practice days.

His funeral service conducted at the St Andrew’s College chapel was crowded and constituted an impressive farewell to a much loved doctor and friend. Bill, Andrew and son-in-law Philip Morreau, a Paediatric Surgeon, described his life and contributions to the community. At the conclusion of the service the immediate family were conducted from the chapel, led by a solitary piper, as Bill would have wanted it.

Bill is survived by Ruth, 4 children, 11 grandchildren, and brothers Barrie and Chris.

He was a gentle man; a good doctor, husband, father, and friend who is greatly missed by many.

Dr Shailer Weston wrote this obituary.
Grants Awarded November 2010

At the November meeting of the Scientific Advisory Group of the National Heart Foundation, a total of 9 grants were awarded. The awards included 8 Small Project Grants, and 1 Travel Grant.

Small Project Grants

Mr Dudley Gentles  
Section of Epidemiology & Biostatistics, University of Auckland  
Is serum urate an independent predictor of CVD in NZ? –Analyses using the PREDICT cohort.  
$15,000 for 6 months.

Ms Bronwyn Tunnage  
Interdisciplinary Trauma Research Unit, AUT University  
Gender inequity in acquisition of 12-lead EGGs from ambulance patients with non-traumatic chest pain.  
$15,000 for 1 year.

Dr Andrew Kerr  
Department of Cardiology, Middlemore Hospital  
Exercise stress echo and aortic stenosis.  
$14,870 for 2 years.

Dr Maria Jüllig  
Maurice Wilkins Centre for Molecular Biodiscovery, University of Auckland  
Molecular basis of coronary artery disease.  
$13,250 for 1 year.

Professor Bob Marshall  
Faculty of Health & Sport Science, Eastern Institute of Technology  
Bikes in schools: health, body composition & cycling activity.  
$14,740 for 14 months.

Dr Nancy Rehrer  
School of Physical Education, University of Otago, Dunedin  
Does bicycle commuting improve indices of cardiovascular health and fitness?  
$13,141 for 1 year.

Dr Suneela Mehta  
Section of Epidemiology & Biostatistics, University of Auckland  
Have special authority requirements been associated with differential access to atorvastatin and clopidogrel by socio-demographic status? ($15,000 for 1 year).

Associate Professor Robert Scragg  
Section of Epidemiology & Biostatistics, University of Auckland  
Predictors of non-fatal and fatal CVD events in adults.  
$15,000 for 2 years.
Travel Grant

Dr Bo Remenyi

*Paediatric and Congenital Cardiac Services, Starship Hospital*

Attendance at RHD ECHO Standardisation Workshop, Singapore.
Erratum

E Overton. Answer to NZMJ about Ron Jones’ research [letter]. N Z Med J.

The author, and a reader who noticed, advise that a number (428 women) was
incorrectly listed as 422 later in the letter.

Please refer to the links above for the corrected copy of this letter.
Erratum


The authors state:

In our viewpoint article (above), we stated that “In 2005 New Zealanders drank and ate, on average, over half a cup (158g) of sucrose (sugar) per day. In contrast, less than 40g a day (about 1½ tablespoons) are recommended by the World Health Organization to prevent dental caries, obesity and chronic disease.”

The figure of 158g is derived from UNFAO data, which includes sugar and other sweeteners. From this source, a more accurate estimate of added sugar (sucrose) intake is 138 g/day (~50 kg/year). Also, to clarify a point raised in a letter to the editor (http://www.nzma.org.nz/journal/123-1325/4427), the WHO’s guideline refers to added sugar, excluding intrinsic sources, such as fruit.

Therefore the figure and associated wording have been changed. Please refer to the above links for the corrected copy.
Decision Making in Medicine: An Algorithmic Approach (3rd edition)


This book comprehensively covers a wide spectrum of diagnostic and management problems ranging from general conditions such as “fatigue” and “low back pain” to the more specific such as “solitary pulmonary nodule” and “choosing a chronic dialysis modality”.

The book is well structured into conventional subspecialties and subjects of interest easily located.

For each subject there is an introduction and descriptive text with an accompanying algorithm on the facing page.

Each topic is written by an expert in their field. The algorithms provide a route map towards a final diagnosis and an outline of management.

Perhaps inevitably algorithms visually diminish the importance of history and examination. Looking at them in detail the North American authorship clearly comes through. For example, that all patients with type I diabetes should be offered insulin pumps would neither be common practice nor practical in many places. First choice for managing a DVT appears to be intravenous heparin rather than subcutaneous low molecular-weight heparin as would commonly be used here, accepting this is considered as an option.

Overall I think the editors and authors have done a good job. This text will be particularly useful as a framework for those developing clinical pathways. Undoubtedly the use of algorithms is going to increase. Much as I like books with pages to turn, as a reference text this might be more useful in the downloadable format, assuming the authors of the algorithms are able to provide timely updates. Whilst treatment is covered, this is limited, and not a criticism of the book but to inform purchasers.

I am not sure this book will solve my “toughest cases”, which the publishers suggest it might. Those patients tend not to fit the precise boxes of an algorithm. But it may well help and will be a useful addition to our departmental (General Medicine) library.

David Cole
Consultant Physician
General Medicine, Christchurch Hospital