

# Nutritional risk amongst community-living Maori and non-Maori older people in Hawke's Bay

Caroline McElnay FNZCPHM;<sup>1</sup> Bob Marshall PhD;<sup>2</sup> Jessica O'Sullivan MPH (Hons);<sup>1</sup> Lisa Jones MA (Hons);<sup>1</sup> Tracy Ashworth BRM;<sup>1</sup> Karen Hicks MA;<sup>1</sup> Rachel H Forrest PhD<sup>2</sup>

## ABSTRACT

**INTRODUCTION:** Maintaining good nutrition is vital for healthy ageing. Poor nutrition increases the risk of hospitalisation, disability and mortality. Research shows clinical malnutrition is preceded by a state of nutritional risk and screening can identify older people at risk of poor nutrition or who currently have impaired nutritional status.

**AIM:** To assess the population prevalence of nutritional risk amongst community-living Maori and non-Maori older people in Hawke's Bay.

**METHODS:** A postal survey of 1268 people aged 65 years or older on the electoral roll for Hawke's Bay was conducted. Nutritional risk was measured using the SCREEN II questionnaire.

**RESULTS:** Responses from 473 people were received (43.8% male, 49.9% female, 6.3% unspecified) with an estimated average age of 74 years. Nutritional risk was present amongst 56.5% of older people with 23.7% at risk and 32.8% at high risk. Maori were 5.2 times more likely to be at nutritional risk than non-Maori. Older people living alone were 3.5 times more likely to be at nutritional risk than those living with others. The most frequent risk factors were low milk-product intake, perception of own weight being more or less than it should be, and low meat and alternatives intake. Skipping meals and low fruit and vegetable intake were additional frequent risk factors for Maori.

**DISCUSSION:** Both living situation and ethnicity are associated with nutritional risk. Further investigation is needed to confirm these findings and to determine issues specific for older Maori, including barriers to good nutrition and opportunities for nutritional improvement.

**KEYWORDS:** Maori; nutritional status; older people

<sup>1</sup>Hawke's Bay District Health Board, New Zealand

<sup>2</sup>Eastern Institute of Technology, Napier

## Introduction

The Hawke's Bay population is ageing, in line with national and international trends. People aged over 65 years currently comprise 14.8% of the total Hawke's Bay population, compared to 13% nationally, and this is predicted to rise to 20% by 2021.<sup>1</sup> As the population ages the health sector is faced with increased demand for health and disability services, including increased demand for residential care. A key challenge for the health sector is therefore to support older people so that they remain healthy and inde-

pendent with a good quality of life for as long as possible.

Maintaining good nutrition is vital for healthy ageing. Poor nutrition increases the risk of hospitalisation, disability and mortality and is associated with declines in quality of life and loss of independence.<sup>2,3,4</sup> Overt clinical malnutrition is relatively uncommon amongst older people who live in the community, with estimates varying from 2% to 10%.<sup>5</sup> However, studies have shown that clinical malnutrition is preceded by a state of nutritional risk and screening can identify

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## CORRESPONDENCE TO:

**Caroline McElnay**  
Director of Population Health, Hawke's Bay District Health Board, PO Box 447, Napier, New Zealand  
Caroline.McElnay@hawkesbaydhb.govt.nz

older people who may be at risk of poor nutrition or who currently have impaired nutritional status.<sup>6</sup> Use of such screening tools, either at an individual level or at a population level, can allow interventions to be designed to prevent progression of nutritional risk to malnutrition.

Studies on nutritional risk amongst community-living older people in Australia, Canada and the UK have found that between 30% and 50% of participants were at risk.<sup>7,8,9</sup> There is limited data for New Zealand, although a recent study of community-living older people in Christchurch, which recruited participants from five medical centres and a falls prevention service, found that 23% were at risk of poor nutrition with a further 31% at high risk of poor nutrition. No ethnic analysis was undertaken.<sup>10</sup>

The aim of this study was to assess the population prevalence of nutritional risk amongst Maori and non-Maori older people aged over 65 years living in the community in Hawke's Bay.

## Methods

In 2009 a postal survey was sent to a sample of older people from the electoral roll for Hawke's Bay, in proportions equal to the total population

by gender and age. The sample was stratified by five-year age bands and people living at aged residential care facility addresses were excluded. The electoral roll indicates if a person is also on the Maori electoral roll and this was used to select Maori participants. Maori were over-sampled in order to ensure sufficient numbers, with 168 Maori and 1100 non-Maori  $\geq 65$  years selected.

The screening tool used to measure nutritional risk was the Seniors in the Community Risk Evaluation for Eating and Nutrition (SCREEN II) questionnaire devised in Canada in 1999.<sup>11</sup> This is a brief self-administered questionnaire which scores risk against three attributes of nutritional risk: weight change, food intake, and risk factors affecting food intake. It has been validated and licensed for use for determining population prevalence of nutritional risk. Permission to use the tool was obtained from the licensor. The screening tool consists of 16 questions. Each question has several possible response options with scores for each question ranging from 0 to 4. Those questions with higher response scores indicate areas of lower risk, and scores of  $\leq 2$  indicate an area potentially leading to nutritional risk. Scores are summed and the nutritional risk for the individual is categorised as 'not at risk' (score  $\geq 54$ ), 'at risk' (score = 50–53) or 'at high risk' (score  $\leq 49$ ).

Four additional questions to assess nutritional knowledge were also included in the survey. In the first two questions respondents were asked if they agreed or disagreed with the following statements—'People my age need more protein rich foods than younger adults' and 'I think it is unhealthy to lose body weight with age'. In the third question respondents were asked to select from seven statements those they thought increased the risk of osteoporosis. A final question asked about problems obtaining groceries.

Descriptive statistics were calculated for the entire group and subgroups by ethnicity, risk level, gender, age group, and living situation. Each individual was assigned to one of the three risk categories ('not at risk', 'at risk' and 'at high risk'). Two sets of analyses were performed. In the first set, the 'at risk' and 'at high risk' categories were combined in order to determine associations

Table 1. Demographics of respondents compared to the 2006 NZ census Hawke's Bay population of over-65-year-olds.

Characteristic of respondents		n	% respondents	% 2006 NZ census
Gender	Male	207	43.8	44.9
	Female	236	49.9	55.1
	Unspecified	30	6.3	n/a
Age group	65–69 yrs	136	28.8	30.7
	70–74 yrs	132	27.9	23.5
	75–79 yrs	100	21.1	19.1
	80–84 yrs	63	13.3	14.1
	85+	42	8.8	12.7
Ethnicity	Non-Maori	433	91.5	91.5
	Maori	40	8.5	8.5
Living situation	Live alone	163	34.5	30.2
	Live with others	309	65.3	69.8
	Unspecified	1	0.2	n/a

between nutritional risk and demographic factors. In the second set, 'at risk' and 'at high risk' were compared. Pearson's Chi-squared tests and odds ratios were used to explore the univariate association while multivariate binary logistic regression analyses were used to assess the independent effects of each factor. All statistical analyses were performed using SPSS version 17.<sup>12</sup>

Ethical approval was received from the New Zealand Central Region Disability and Health Ethics Committee, Ministry of Health (CEN/09/13/EXP).

## Results

Of the 1268 questionnaires distributed, 473 questionnaires were returned giving an overall response rate of 37.3% (Maori 23.8%; non-Maori 39.4%). Demographics of the respondents are, in general, similar to the population of over-65-year-olds in Hawke's Bay according to the 2006 NZ census (Table 1). Any slight differences may be due to the fact that those living in residential care were excluded from the sample for this study (but would be included in the Census figures).

Nutritional risk was present in 56.5% of respondents (n=267) with 23.7% 'at risk' (n=112) and 32.8% 'at high risk' (n=155). There were 30.7% of respondents 'not at risk' (n=145). It was not possible to calculate a score for 12.9% of respondents due to missing data (n=61). Table 2 outlines the respondent characteristics according to nutritional risk status.

## WHAT GAP THIS FILLS

**What we already know:** Little recent information is available on the population prevalence of nutritional risk amongst community-living older people.

**What this study adds:** This study reports the prevalence of risk for a sample of Maori and non-Maori and discusses the factors influencing nutritional risk within this group. Given the high levels of risk, the authors recommend targeted screening for older Maori and older people living alone.

## Combined risk status ('at high risk' and 'at risk') versus 'not at risk'

Gender and age group were not found to be associated with nutritional risk ( $\chi^2$ ,  $p=0.361$  and  $p=0.591$  respectively). Ethnicity (Maori or non-Maori;  $\chi^2$ ,  $p=0.005$ ) and living situation (alone or with others;  $\chi^2$ ,  $p<0.001$ ) showed significant univariate associations with risk. When the independent effects of ethnicity and living situation were assessed using a forward stepwise binary regression model (n=387) that controlled for age and gender, the strong associations persisted (Table 3). Further, the data indicate that Maori are 5.2 times more likely to be at nutritional risk than non-Maori, and that those living alone are 3.5 times more likely to be at nutritional risk than those living with others.

## 'At risk' versus 'at high risk'

Those individuals 'not at risk' were removed from the data set for this analysis. Gender, age group

Table 2. Numbers and percentages of respondents in each nutritional risk group by gender, living situation and ethnicity

Characteristic of respondents		Nutritional risk status (number and %)				
		At high risk	At risk	Not at risk	Unknown	Total
Gender	Female	80 (33.9)	53 (22.5)	68 (28.8)	35 (14.8)	236 (100)
	Male	67 (32.4)	50 (24.2)	70 (33.8)	20 (9.7)	207 (100)
	Unknown	8 (26.7)	9 (30)	7 (23)	6 (20)	30 (100)
Living situation	Live alone	75 (46.0)	39 (23.9)	26 (16.0)	23 (14.1)	163 (100)
	Live with others	80 (25.9)	72 (23.3)	119 (38.5)	38 (12.3)	309 (100)
	Unknown		1 (100)			1 (100)
Ethnicity	Maori	25 (62.5)	3 (7.5)	4 (10.0)	8 (20.0)	40 (100)
	Non-Maori	130 (30.0)	109 (25.2)	141 (32.6)	53 (12.2)	433 (100)
Total		155 (32.8)	112 (23.7)	145 (30.7)	61 (12.9)	473 (100)

Table 3. The odds ratios\* for the relationship between nutritional risk and ethnicity (Maori or non-Maori) or living situation (alone or with others).

Variable	Univariate model <sup>†</sup>	P-value	Multivariate model <sup>‡</sup>	P-value
<b>Ethnicity (Maori)</b>	4.13 (1.42–12.02)	0.005	5.21 (1.52–17.90)	0.009
<b>Living situation (alone)</b>	3.44 (2.10–5.59)	<0.001	3.53 (2.06–6.06)	<0.001

\* With the 95% confidence intervals in brackets

† The univariate model contained either ethnicity or living situation

‡ The multivariate model included gender and age group in block 1 (method=enter) and ethnicity and living situation in block two (method=forward stepwise).

Table 4. The odds ratios\* for the relationship between either ethnicity (Maori or non-Maori) or living situation (alone or with others) and a high nutritional risk

Variable	Univariate model <sup>†</sup>	P-value	Multivariate model <sup>‡</sup>	P-value
<b>Ethnicity (Maori)</b>	6.99 (2.05–23.77)	<0.001	6.44 (1.87–22.11)	0.003
<b>Living situation (alone)</b>	1.73 (1.05–2.86)	0.031	Not left in the model	0.069

\* With the 95% confidence intervals in brackets

† The univariate model contained either ethnicity or living situation

‡ The multivariate model included gender and age group in block 1 (method=enter) and ethnicity and living situation in block two (method=forward stepwise).

and living situation were not found to have significant univariate associations with 'at high risk' when compared to those 'at risk' ( $\chi^2$ ,  $p=0.205$ ,  $p=0.158$  and  $p=0.053$ , respectively).

A significant univariate association was observed for ethnicity (Maori or non-Maori;  $\chi^2$ ,  $p<0.001$ ). When the independent effects of ethnicity and living situation were assessed using a forward stepwise binary logistic regression model ( $n=249$ ) that controlled for age and gender, the strong association between ethnicity and high nutritional risk persisted whereas living situation was not maintained in the model (Table 4). The data indicate Maori are 6.4 times more likely to be 'at high risk' than 'at risk' when compared with non-Maori.

Nutritional risk factor responses with a score of  $\leq 2$ , which indicate an area potentially leading to nutritional risk, are presented in Figure 1. The most frequently occurring risk factors for respondents at nutritional risk were low milk-product intake (72.3%), perception of own weight being more or less than it should be (57.3% more, 5.2% less), low meat and alternatives intake (61%), and eating alone (42.3%).

Analysis of the nutritional risk factor data by ethnicity showed that the most frequent risk fac-

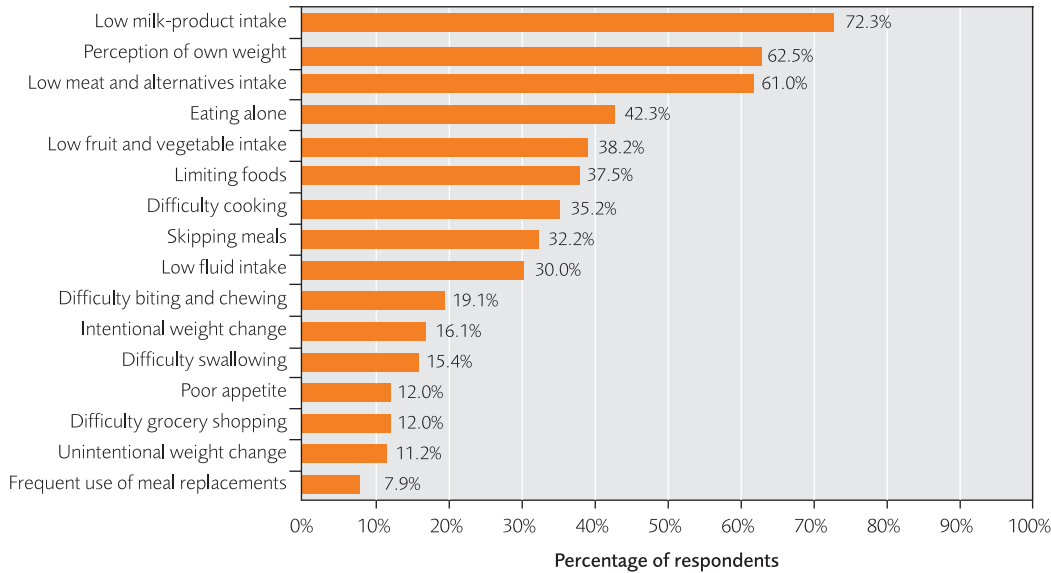
tors for Maori at nutritional risk were low fruit and vegetable intake (71%), a perception that their weight was more or less than it should be (68%), a low milk-product intake (68%), a low meat and alternative protein intake (68%) and skipping meals (61%) (Figure 2).

For those living alone the most frequent risk factors were eating alone (89%), low milk-product intake (70%), low meat and alternative intake (62%), a perception that their weight was more or less than it should be (51%) and difficulty cooking (41%).

Analysis of the nutritional knowledge questions showed that only 36% understood that older people need more protein-rich foods than younger adults, and 35% recognised that it was unhealthy to lose body weight with age. Less than half of respondents knew that spending less than one hour per day in sunlight, eating food with a high salt content, smoking, and drinking more than two to three standard drinks of alcohol per day could increase the risk of osteoporosis.

Only 9.5% of all respondents indicated they had some difficulty getting groceries, with limited income, disability, or lack of transportation the most common reasons given.

Figure 1. Percentage of respondents rating nutritional risk factors  $\leq 2$  for the combined risk group

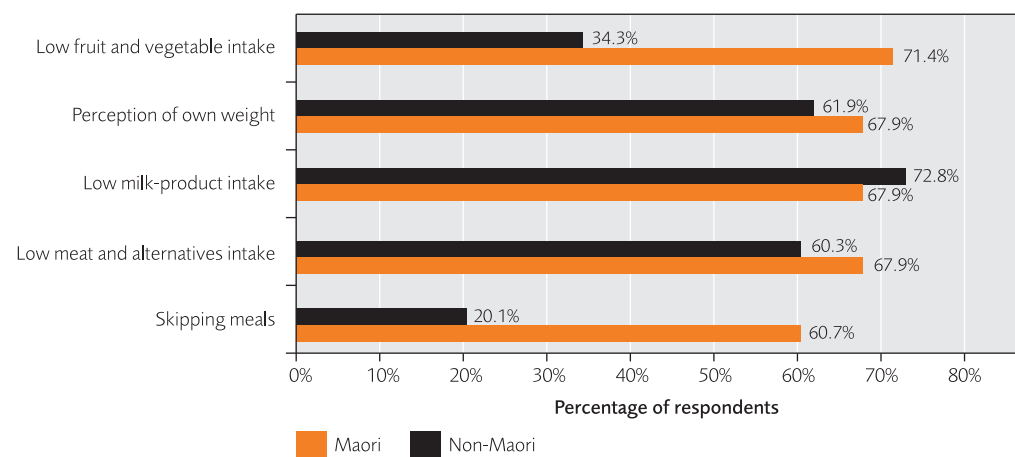


## Discussion

The survey respondents were very similar to the population of over-65-year-olds as a whole in Hawke's Bay. Despite a lower response rate from Maori, oversampling for Maori ensured that the proportion of Maori in the respondent population was similar to the proportion of Maori in the total Hawke's Bay over-65-year-old population. Voluntary self-completion postal surveys are susceptible to response bias, but we are unable to determine the factors involved here.

This study showed that nutritional risk was present amongst 56.5% of community-living older people in Hawke's Bay, with 23.7% at risk and 32.8% at high risk (as classified using the SCREEN II tool). These results are similar to other New Zealand studies, with Watson et al. reporting 23% at risk and 31% at high risk (although their numbers were small) and Wham et al. reporting 52% of their sample of 75–85-year-old people being at high risk.<sup>10,13</sup> Other studies using a variety of nutrition risk assessment tools have also shown that nutrition risk is common

Figure 2. Five most common nutritional risk factors for Maori respondents in the combined risk group, rating nutritional risk factors  $\leq 2$ , compared to non-Maori respondents in the combined risk group



amongst community-living older people, with estimates ranging from 24% to 57%.<sup>2,7,8,9,14</sup>

This study is the first New Zealand study to provide information on nutritional risk for Maori and showed that older Maori are 5.2 times more likely to be at nutritional risk than non-Maori. Our study also shows that older Maori at nutritional risk are more likely to skip meals and to have a low fruit and vegetable intake than non-Maori. Due to the small numbers of Maori in the over-65-year-old population in Hawke's Bay (and the corresponding small numbers in this study), these results should be interpreted with caution. However, the results do suggest that there may be specific nutritional issues for older Maori and further research is required to determine the nature of these issues, including barriers to good nutrition and opportunities for nutritional improvement.<sup>15</sup> Older Maori tend to have poorer health than older non-Maori and the higher prevalence of nutritional risk may reflect this. The SCREEN II tool has not, however, been validated in New Zealand and this should be considered when interpreting these results.

Living alone also increases nutritional risk, with those living alone being 3.5 times more likely to be at nutritional risk than those living with others. Other studies have confirmed the impact of living alone or eating alone on nutritional status—people who live alone are more likely to eat alone, and people who eat alone tend to eat less and eat a less varied diet.<sup>2,8,9,11,13</sup>

Low intakes of milk products, meat and alternatives, and low fruit and vegetables found in this study are commonly occurring risk factors in other published literature.<sup>7,10</sup> Milk and milk products are the source of half the dietary calcium for men and women aged over 65 years.<sup>16</sup> It is likely, therefore, that older people with low milk-product intake have a low calcium intake with consequent osteoporosis and increased bone fracture risk. Our survey also showed a lack of knowledge about other factors which may reduce the risk of osteoporosis.

Low intake of meat and alternatives may result in inadequate protein intake with consequent increased skin fragility, decreased immune function, poorer healing and longer recuperation from ill-

ness.<sup>14</sup> Protein requirements actually increase with age, but only 36% of our respondents knew this.

Perception of own weight being more or less than it should be was the second most frequently occurring risk factor, with the majority of those with this risk factor indicating that their weight was more than it should be. Intentional weight loss amongst older people often leads to a loss of muscle mass and sarcopenia. This may result in an increased likelihood of falls, disability, and osteoporotic fractures. Skipping meals and limiting intake of dairy products and protein may be ways in which older adults attempt to lose weight, yet in doing so they may be compromising their health.

Identifying older adults with risk factors and inadequate food intake is essential before they develop weight loss and overt malnutrition, which is more difficult to reverse.<sup>17</sup> The lack of specific age-related dietary knowledge in this study highlights the need for targeted and specific health education messages and health promotion approaches for older people. Health promotion for older people can be effective, with age not necessarily a barrier to behavioural change.<sup>18</sup> Dietary advice for an older person needs to emphasise a healthy, balanced food intake and exercise rather than dietary restriction. Programmes that bring older people together to share meals have been shown to be effective in improving nutritional and health outcomes for older people.<sup>19,20</sup>

Our study also suggests that targeted screening should be considered for older Maori and older people living alone.

This research confirms that there are significant levels of nutritional risk amongst community-living older people in Hawke's Bay. It appears that risk may be highest for older Maori (although further research is needed to confirm this due to small numbers in the sample) and for those living alone. This is a multifaceted issue requiring a multifaceted approach with intervention strategies needed across the continuum, from health promotion and health education to community-based screening and assessment.<sup>13,21</sup> Further work is planned to better understand the needs of older Maori, to raise awareness amongst primary health professionals, and to develop and deliver a local health promotion programme.



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## COMPETING INTERESTS

None declared.