



MASSEY UNIVERSITY

*Latest Food and Nutrition
Guidelines for Older People*

Hamilton, 21 July 2011

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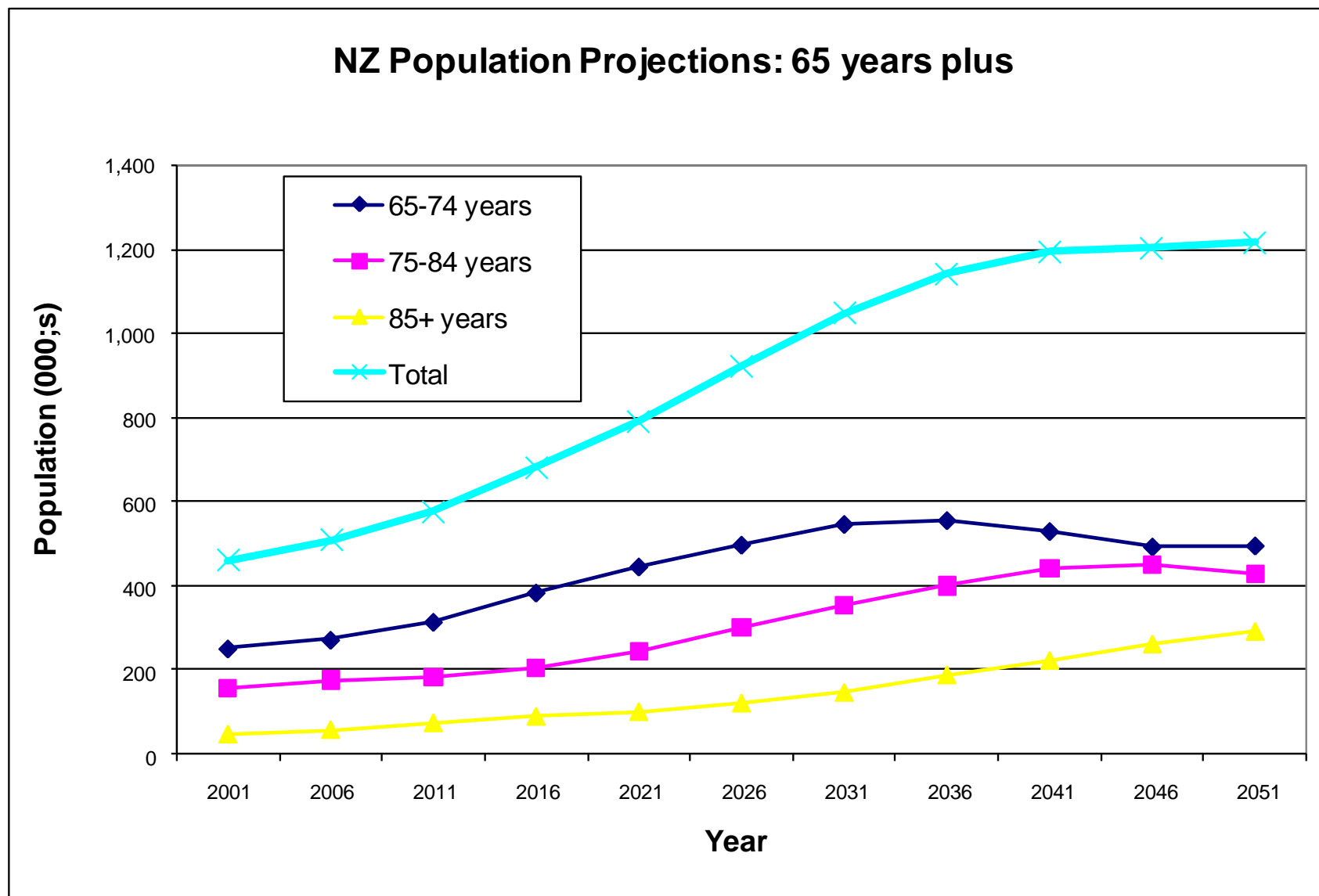
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Guideline Statements

1. Maintain a healthy body weight by eating well and by daily physical activity.
2. Eat well by including a variety of nutritious foods from each of the four major food groups each day.
 - Eat plenty of vegetables and fruit.
 - Eat plenty of breads and cereals, preferably wholegrain.
 - Have milk and milk products in your diet, preferably reduced or low-fat options.
 - Include lean meat, poultry, seafood, eggs, nuts, seeds or legumes.
3. Drink plenty of liquids each day, especially water.
4. Prepare foods or choose pre-prepared foods, drinks and snacks:
 - with minimal added fat, especially saturated fat
 - that are low in salt (if using salt, choose iodised salt)
 - with little added sugar (limit your intake of high-sugar foods).
5. **Take opportunities to eat meals with other people.**
6. Eat at least three meals every day.
7. Purchase, prepare, cook and store food to ensure food safety.
8. If choosing to drink alcohol, limit your intake.
9. Be physically active by taking every opportunity to move, and include 30 minutes of moderate-intensity physical activity on most if not all days of the week.



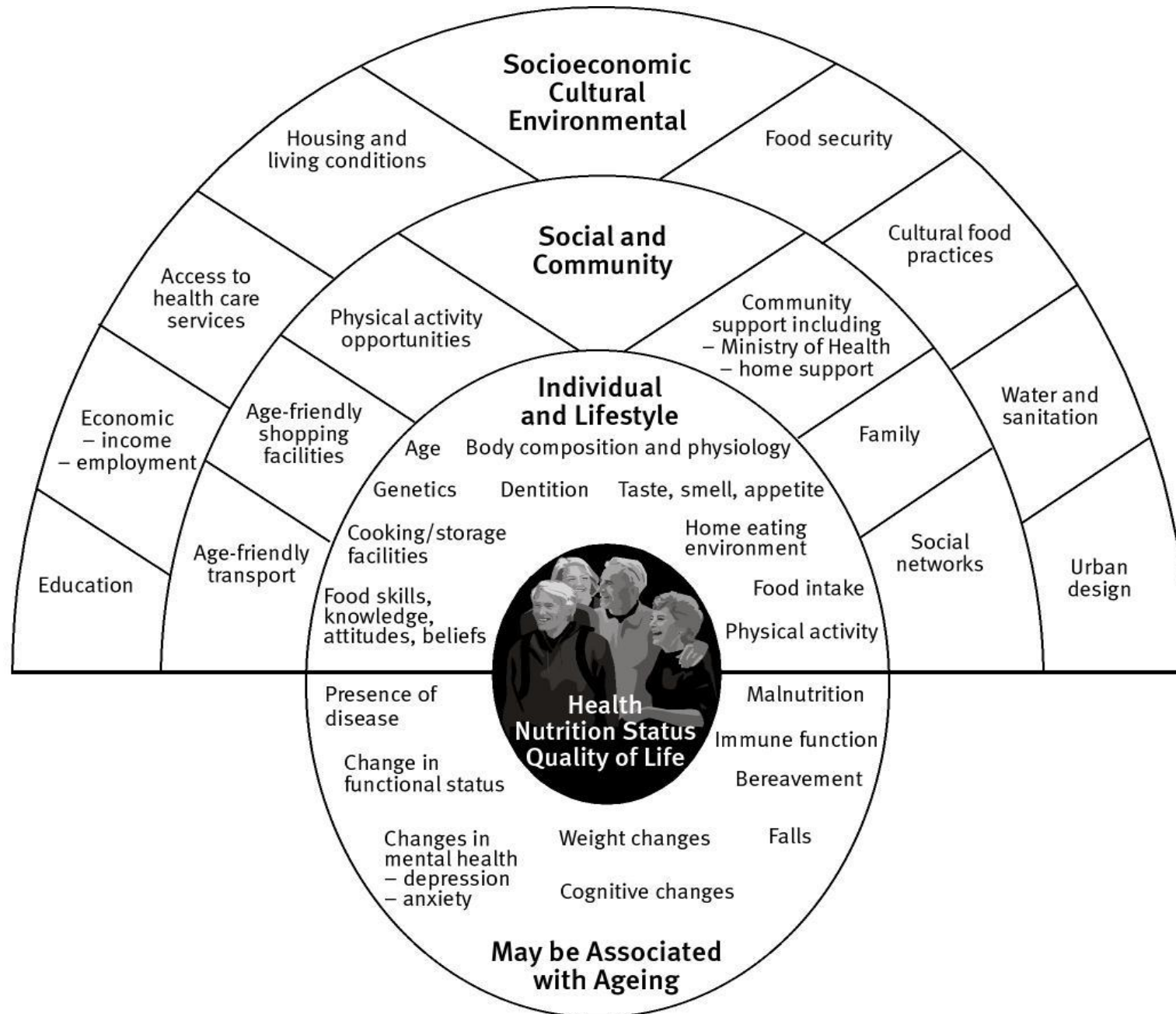


Source: Statistics New Zealand. Population Projections 2001(base)- 2051. Series 4

1 Ageing, nutrition and health

- Good nutrition is associated with
 - preventing malnutrition
 - supporting physical function
 - reducing risk of chronic disease
 - supporting mental health
 - preventing disability
- Targeting modifiable factors may contribute to slowing or even reversing a decline in health - food skills and knowledge, living arrangements, physical and social environment

Determinants of nutrition related health

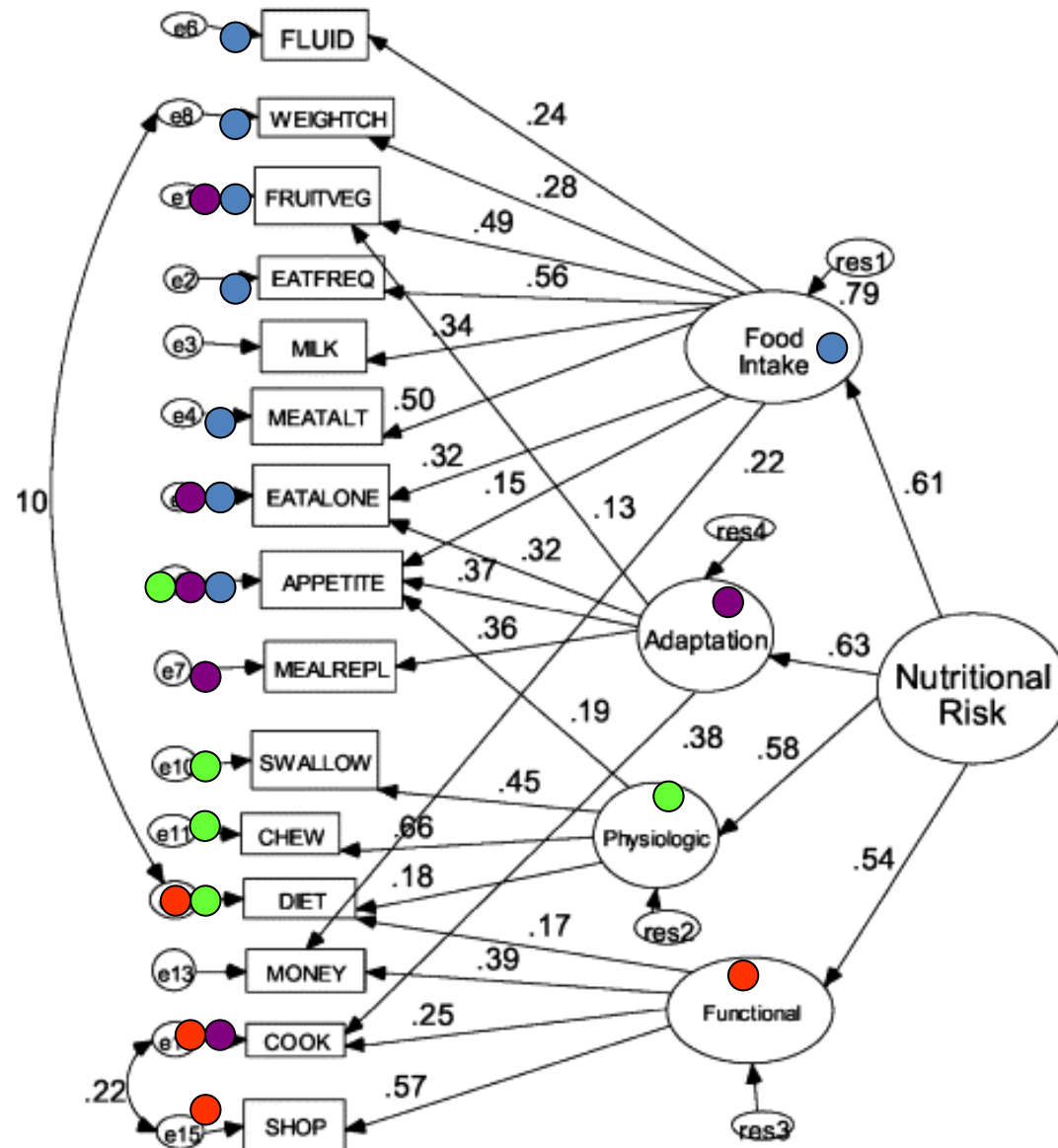


Preventing malnutrition

How does SCREEN represent nutrition risk?

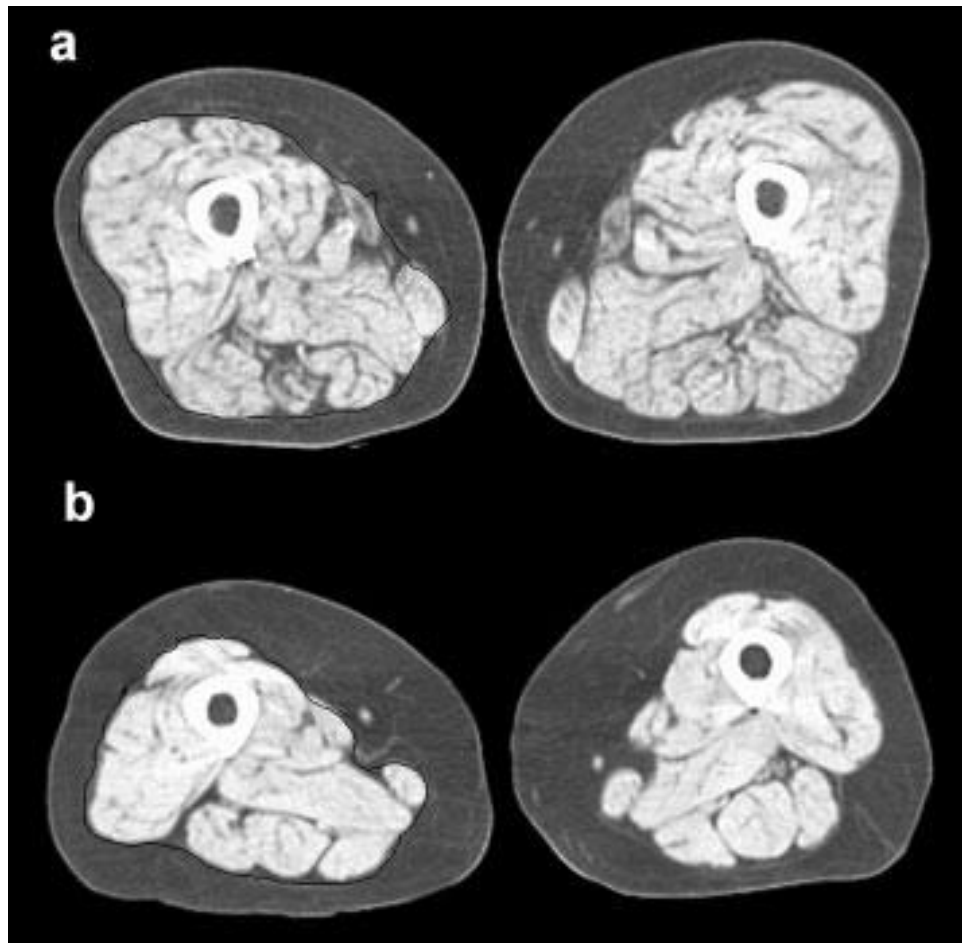
Final four-factor structural equation model for nutritional risk in seniors. Keller H, 2006 J Clin Epidemiol;59(8), 836-41

Seniors in
the
Community:
Risk
Evaluation
for
Eating and
Nutrition



Changes in body composition and physiology

Examples of mid-thigh scans in two subjects having differing levels of fatty infiltration.



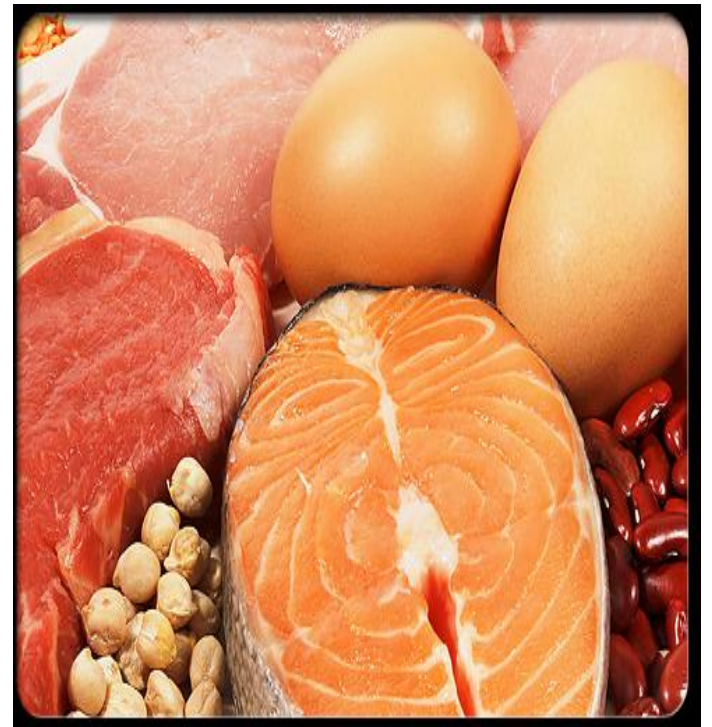
Supporting physical function

- Changes in body composition may be impacted through changes in nutrient requirements
 - Moderate increases in daily protein attenuate loss of muscle mass
 - Participants in the Health ABC study with the highest intake of energy adjusted protein intake lost 40% less lean mass than those in lowest quintile (Houston et al, 2008)
 - Quantity of skeletal muscle mass may be determined by type of protein intake (Aubertin-Leheudre et al, 2009)
 - Maximum protein synthesis may be achieved only if protein is spread across main meals (Paddon-Jones et al, 2009)



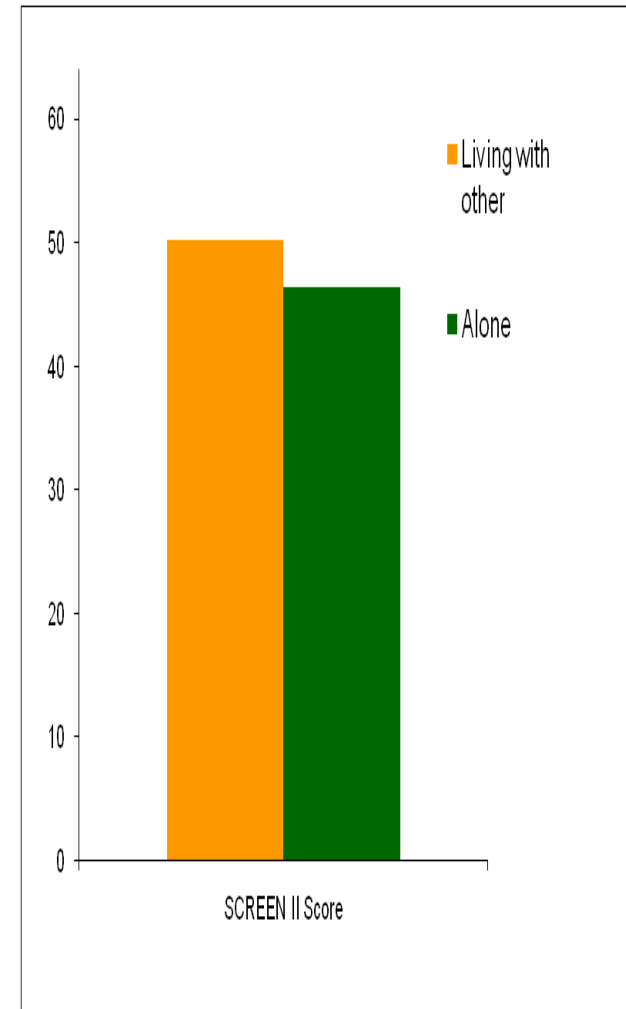
Protein

- Protein requirements >70 years are 25% more than younger adults (NHMRC, 2006)
 - 81 g (1.07g/kg) for men
 - 57 g (0.94 g/kg) for women
- Suggestions to increase to 1-1.3g/kg/day or 20-35% of energy intake
- To yield maximum protein synthesis daily allowance should be evenly distributed across breakfast, lunch and dinner (Paddon-Jones et al, 2009)



Social and community factors

- Meals eaten with others tend to be larger by up to 44 percent than when eaten alone DeCastro (2002)
- Meal sharing increases food intake and dietary variety (Bernstein et al, 2002)
- Eating is facilitated by the companionship an older person receives when someone else is present Locher et al (2005)
- Mean score for older people who lived with others (50.3 ± 5.1) versus those who lived alone (46.4 ± 5.8) ($p=0.001$) (Wham et al 2011)



Psychological Factors



Socioeconomic, cultural, environmental factors

- Economic factors
 - Lack of income established cause inadequate food intake: 15% of older Maori face some financial difficulty; 20% face severe difficulties (Cunningham et al, 2002)
- Food security
 - As food is major unfixed component of total budget, quality and quantity may be compromised
 - In NNS97 Pacific people followed by Maori experienced most food insecurity
- Physical environment
 - Affects food procurement, preparation, cooking and eating



2 Dietary patterns of older people

- **Limited data for advanced age**
 - 2006/7 NZ Health Survey - data on vegetable and fruit consumption of older people (MOH, 2008)
 - 1997 NNS - data on food group consumption, nutrient intake and frequently eaten foods for older people. Small sample for Maori >45years (Russell et al, 1999)
 - 1998/89 The Mosgiel Community Study of Health and Nutrition in Old Age (Part 1) and 1995/96 (Part 2) - data on food group consumption (Horwath et al, 1992; Fernyhough et al, 1999).
 - UK National Diet and Nutrition Survey>65years included 4 day weighed intake from 459 people 85+ (Finch et al, 1998)
 - Australian Longitudinal study of Ageing used ANSI in 1000 subjects 70+ years. Self completed FFQ in subgroup of 300 (Cobiac and Syrette, 1995)

Dietary patterns

- NNS97 showed energy intake lower in people >65 years
- Older people more likely to eat recommended servings of fruit and vegetables
- Few older people ate recommended servings of bread and cereals
- People 65-74 years more frequently choose trim milk than other age groups
- Most common dietary change was to alter the amount and type of high fat foods consumed



3 Nutrients, food and drinks

Energy, Iron

- Recommendations for older adults are lower for energy and iron (women only >51y)
 - BMR decreases due to reduced lean muscle mass
 - Physical activity levels lower
 - For women an increase in iron stores after menopause
 - Iron deficiency mostly results from chronic blood loss, drug therapy, disease, neoplasms



Folate, Iodine, Zinc, Sodium

- Mandatory fortification of bread with folic acid and iodine (via iodised salt) will improve older people's folate and iodine status.
- Consuming foods with zinc and vitamin B12 is important, and older people may be at higher risk of deficiency than younger adults.
- Older people should choose foods low in salt, and use minimal added salt when preparing food.



Calcium, Vitamin D

- Recommendations for older adults are higher (>51 in women and >70 in men)
- Healthy older women, randomised to receive calcium supplementation, showed increased rates of myocardial infarction among those who received calcium citrate supplements. Use of calcium supplementation may increase the incidence of cardiovascular events (Bolland et al 2008).
- Results from 5-year Australian trial of 120 community-dwelling women aged 70 to 80 years found for preventing bone loss, taking a 25 µg supplement of vitamin D per day was more effective than taking only 1200 mg calcium per day (Zhu et al 2008).



Vitamin B₁₂

- Approximately 10% of older people have sub-optimal serum vitamin B₁₂ (de Jong et al 2003; Green et al 2005).
- Almost all dietary sources come from animal foods
- Plant-based sources include certain algae and plants exposed to bacterial action or contaminated by soil or insects.
- Secretions of gastric acid, intrinsic factor and pepsin from the stomach are required for absorption
- In older people with atrophy of the stomach mucosa, or atrophic gastritis, secretions are lower, reducing bioavailability (Truswell 2007).
- Older people with atrophic gastritis may require higher intakes of vitamin B₁₂-rich foods, fortified foods or supplements. Strict vegans will require supplementation (NHMRC 2006).



4 Considerations for older Maori

Important to recognise:

- Maori world view of health, illness and kai
- Nutrition-related health inequalities and low
- NNS97 found 25% Maori women >45years money for food



Cultural importance of food for Māori

(Wham et al, In Press)

- 26/33 identified foods of cultural significance
- 24/33 able to eat these on a regular basis
 - From the sea: Kai moana, Mussels, Fish heads, Titi, Tuna, Eel, Mutton bird
 - From the land: Kamokamo, Kumara, Kanga wai (fermented corn), Puha, Watercress, Rawena bread, Chicken, Banana
 - From the forest: Miro berries, Wild pork, Fruit from cabbage
- 97% identified pollution and care of the environment as extremely important - affected their ability to eat traditional Māori foods.
- Traditional foods brought by family members reflecting the Maori practice of *manaakitanga*
- Access influenced by availability/ seasonal changes.



5 Physical activity

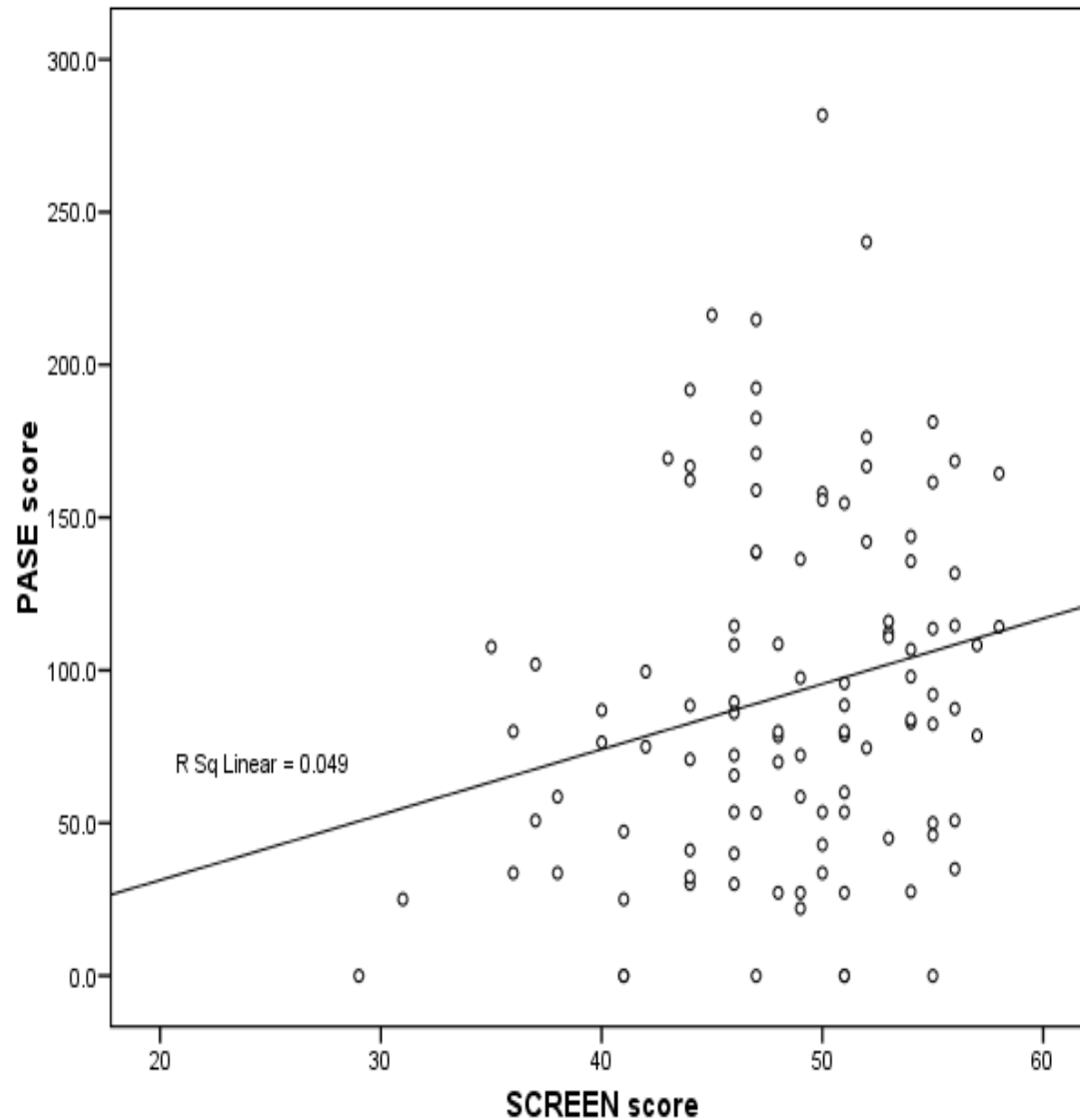
- Older people suggested to:
- be active for at least 30 minutes most days of the week (at least 5 days)
- do a range of activities each week
- have fun, and be active with friends, family or whānau
- replace sedentary activities with more active leisure activities
- prevent falls and promote independent living by including strength and balance training
- be safe and listen to their bodies (ie, if they experience any chest pain or dizziness they should seek medical advice).



	Recommended physical activity		
	Aerobic	Progressive resistance	Balance and flexibility
Arthritis	✓ Low impact	✓ Strength	
Cancer (breast, colon, prostate)	✓ Moderate with extra vigorous intensity		
Congestive heart failure	✓ Moderate intensity	✓ Endurance	
Coronary artery disease	✓ Moderate intensity	✓ Endurance	
Depression	✓ Moderate to high intensity	✓ Endurance	
Frailty, disability	✓ Low to moderate impact	✓ Core strength	
Mobility impairment, falls	✓ Low to moderate intensity	✓ Core strength	✓ Progressive strength-based Low intensity
Osteoporosis	✓ Weight bearing	✓ High-impact, high-velocity loading (eg, jumping)	✓ Prevent falls
Stroke	✓ Moderate, with some vigorous intensity	✓ Endurance	
Type 2 diabetes mellitus	✓ Sufficient energy expenditure Regular moderate intensity	✓ During weight loss maintains lean tissue More feasible for complex co-morbidity	
Urinary stress incontinence		✓ Pelvic floor isometric strengthening	✓ Improved posture



Physical Activity and Nutrition Risk ($p=0.027$)



6 Chronic disease and nutrition

	Obesity	CVD	T2DM	Cancer ¹	Osteoporosis
Nutrient-based risk factors					
Dietary fibre	✓	✓	✓		
Saturated fats			x		
Trans fatty acids		x			
Linoleic acid, α-linolenic acid and oleic acid		✓			
Plant sterols/stanols					
Dietary cholesterol		x			
Myristic and palmitic acids					
Sodium (salt)		x			
Potassium		✓			
Vitamin D					✓
calcium					
Folate		✓			

Convincing or probable associations between food, nutrition and lifestyle factors and risk for some chronic diseases

Risk factors for chronic disease	Obesity	CVD	T2DM	Cancer ¹	Osteoporosis
Food-based factors					
Vegetables and fruit		✓		✓	
Wholegrain cereals		✓			
Fish and fish oils		✓			
Nuts		✓			
Preserved meat				x	
Salt preserved foods				x	
Energy-dense, micronutrient poor foods	x				
Sugar-sweetened soft drinks and juices	x				

Lifestyle factors and chronic disease

Lifestyle factors	Obesity	CVD	T2DM	Cancer ¹	Osteoporosis
Overweight / obesity		x ²	x	x	
Voluntary weight loss			✓		x ³
Regular physical activity	✓	✓	✓	✓	✓
Sedentary lifestyle	x		x		
Alcohol		✓ x		x	x

Source: WHO and FAO 2003.

CVD = cardiovascular disease, T2DM = type 2 diabetes mellitus.

✓ = associated with a decreased risk of chronic disease; x = associated with an increased risk of chronic disease.

1 For cancer, these risk and preventive factors vary for different types of cancer.

2 For type 2 diabetes, risk is greater for abdominal obesity.

3 For osteoporosis, a low body weight is associated with increased risk.



6 Frailty

- Concept used to identify those at high risk of:
 - adverse health outcomes (including falls)
 - becoming dependent
 - co-morbid illness
 - admission to an institution
 - mortality (Morley et al 2002; Fried et al 2001; Barrett et al 2006).
 - An overall state of vulnerability
 - Part of the process of declining health towards adverse health outcomes and, eventually, death (Abellan Van Kan et al 2008)
- (FRAIL)
 - **F**atigue
 - **R**esistance (ability to climb stairs)
 - **A**mbulation
 - **I**llnesses
 - **L**oss of weight ($>5\%$)
- (Abellan Van Kan et al 2008).

Prevalence of Frailty: 2001 Living Standards of Older New Zealanders Survey Barrett et al (2006)

	Total sample (n)	Frail subgroup (n)	Proportion in frail subgroup (%)
Age group (years)			
65–69	912	57	6.2
70–74	785	45	5.7
75–79	614	49	8
80–84	392	41	10.4
85–89	178	32	18
90+	50	13	26
	2931	237	8.1
Ethnicity			
Non-Māori	2818	224	7.9
Māori	113	13	11.5

Three categories explain frailty

Morley et al (2002)

(1) Intrinsic factors:

- sarcopenia and related metabolic pathogenic factors
- atherosclerosis
- cognitive impairment
- malnutrition

(2) Social factors that determine the severity of frailty:

- low income
- low education
- lack of family or societal supports

(3) Potentially treatable precursor conditions

Anorexia/pain/inactivity/diabetes/lack of exercise/depression/fear of falling/delirium.



Sarcopenia

- Age-associated change in body composition towards loss lean mass
- As muscle mass is the most metabolically active body tissue, and muscle mass and strength are required for physical activity, sarcopenia has implications for both energy metabolism and functional capacity
- With the sarcopenic loss of muscle mass there is also an increase in body fat mass. Changes in fat mass distribution from visceral to abdominal lead to an increased risk of cardiovascular disease.



Malnutrition

- Malnutrition is a strong determinant of frailty (Morley et al 2002)
- Indicators of malnutrition have been used in various definitions of frailty.
- Fried et al definition, unintended weight loss, exhaustion, weakness and slow walking speed may all reflect a relationship with nutritional status or malnutrition.
- Other indicators of frailty, such as presence of chronic disease, are also clearly linked to nutrition.



Prevalence of Nutrition Risk

Study Community living older people	N	Age years Mean (Range)	SCREENII (Range) (0-64)	% High risk SCREENII score <50
LILACS NZ (Wham et al, 2010)	108	Maori 76.6 ± 1.8 Non-Maori 85.2 ± 0.6 (75-85)	Median 49 (29-58)	52
North Shore City (Wham et al, 2010)	51	82 ± 1.7 (80-85)	Mean 52.2 ± 6.7 (38-61)	31
Christchurch (Watson et al, 2010)	152	79.5 (70+)		31
Canada (Keller and Hedley, 2002)	247	71.7 ± 8.3 (55-91)	Mean 49.6 ± 5.9	24
Canada 'vulnerable' Keller and McKenzie (2003)	367	79.3 ± 7.9 (54-100)	Mean 46.6 ± 7.4	44
Canada (Keller et al, 2006)	251	74 ± 7.4		39



Factors associated with nutrition risk (SCREEN II score<50) Wham et al (2011)

	Spearman's Correlation Coefficient	P value
Hb	0.303	0.007
Zinc	0.264	0.029
Grip Strength (Right)	0.205	0.041
Muscle Mass (%)	0.305	0.004
Body Fat (%)	-0.361	0.001
Total PASE score	0.198	0.042

7 Food safety

- Older people are at increased risk of foodborne illness.
- Ageing and poor nutritional status are associated with altered regulation of the immune system.
- Older people should maintain nutritional adequacy and immune function by continuing to eat a variety of food from all four food groups. They should not limit dietary intake because of unnecessary concerns over food safety.
- Older people who have difficulty with sight, smell or mobility, or who have inadequate kitchen facilities, may need extra assistance to identify whether a food is safe or not.



www.moh.govt.nz

NUT0004 - Eating Well For Healthy Older People

Nutrition guidelines for healthy older adults, including serving sizes, physical activity and fluid intake and food safety advice. Revised April 2008. MoH code HE1145

[Food and Nutrition Guidelines for Healthy Older People - A Background Paper \(2010\)](#)

[Food and Nutrition Guidelines for Healthy Older People: A background paper - Draft for consultation \(2009\)](#)

