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**LACK OF AWARENESS OF HEALTH PROMOTION MESSAGES
IN A GROUP OF NEW ZEALANDERS OVER THE AGE OF
FORTY LIVING IN THE MANAWATU**

A thesis presented in partial fulfilment of the requirements for the

MASTER OF PHILOSOPHY

**at Massey University, Palmerston North,
New Zealand**

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Erratum sheet

1. p.13. paragraph 2, line 4 should read

Body mass index or BMI (weight in kg/height in m²) is a simple method for assessing whether adults are obese or overweight.

2. p.26, 2.2.2 line 8 should read

Under-reporters were identified by a cut-off test for urine;Urine N:NI >0.8 (Black et al, 1997), and EI<1.47 x estimated BMR (Goldberg et al 1991).

Black, A.E., Bingham, S.S., Johansson G., Coward, W.A. (1997). Validation of dietary intakes of protein and energy against 24 hour urinary N and DLW energy expenditure in middle-aged women, retired men and post-obese subjects: comparisons with validation against presumed energy requirements. European Journal of Clinical Nutrition. **51**, 405-413.

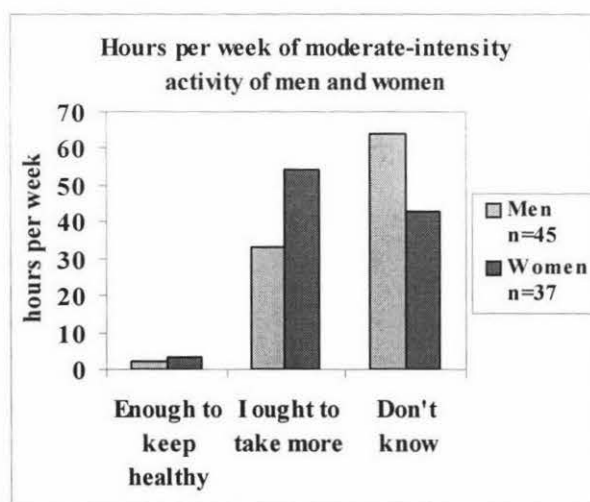
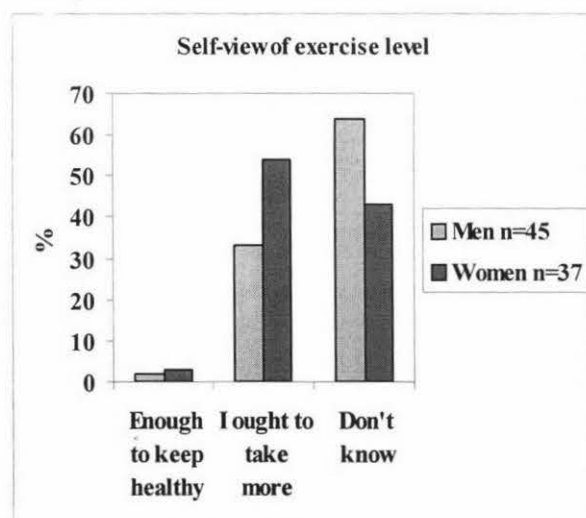
Goldberg, G.R., Black, A.E., Jebb, S.A., Cole, T.J., Murgatroyd, P.R., Coward, W.A., Prentice A.M. (1991). Critical evaluation of energy intake using fundamental principles of energy physiology:1. Derivation of cut-off limits to identify under-recording. European Journal of Clinical Nutrition. **45**, 569-581

3. p.27. Omit last sentence as it is repeated from p.26, 2.2.2, line 6.

4. p.37. Body fat section – omit ‘for’ in the first sentence

5. p.38, table should read

6 p.39 table should read



ABSTRACT

The aim of the Health Promotion Awareness Study was to assess the awareness of health promotion messages from public and commercial organisations in a non-random group of self-selected adults living in the Manawatu. A secondary aim was to compare the lifestyle habits of the group with those reported in national surveys.

The study involved 115 self-selected New Zealanders (43 men and 72 women) over the age of forty years. Awareness of health promotion messages was assessed using a mailed out survey of which 69 were returned. Adherence to health promotion messages from commercial organisations was also assessed. Food intake was estimated by 24-hour dietary recall. Basic anthropometric measurements were made (height, weight, hip and waist circumference), and a submaximal exercise test was used to assess fitness. Habitual physical activity was defined using two questionnaires and a self-reported assessment of health (SF-36) was completed. The results show that subjects met the New Zealand national guidelines for food intake, fitness and physical activity but felt they ought to exercise more. There was a good awareness of national health promotion organisations but only half the subjects had a general idea about the content of the health messages with women having a greater awareness than men. Messages from commercial organisations were generally not adhered to.

This group of adult New Zealanders had a healthy lifestyle that was not associated with a high awareness of public health messages, suggesting that other sources of health information are used.

PREFACE AND ACKNOWLEDGEMENTS

“I have presented the main findings in this thesis as an oral communication to the Nutrition Society (NZ) at their annual scientific meeting in Christchurch, in November 2000. A paper which also describes this work, has been accepted for publication by the Asia Pacific Journal of Clinical Nutrition”

I would like to thank my supervisor, Dr Hilary Green, for providing me with the original data and her invaluable help and advice in guiding me throughout the completion of my thesis. I am also grateful to Jillian Richards and Richard Bunning who assisted Hilary with human testing and data entry. In particular I would like to acknowledge Brian Pawson who assisted me with analysing the data and increasing my computer literacy.

On a personal level I thank my partner, Mark Stoneman for encouraging me to gain further qualifications and to strive for excellence.

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Chapter 1

Background and Introduction

1.1 Background

The benefits of exercise and diet have been well documented in many studies. Epidemiological studies have linked coronary heart disease to diet, in particular dietary fat. In developed parts of the world coronary heart disease is common and is associated with a large percentage of energy intake which comes from saturated fats and refined sugar. In underdeveloped countries with different nutritional patterns coronary heart disease is rare (Stamler, 1979). Diet also plays a role in a number of other diseases including hypertension, colon and breast cancer and diabetes (US Department of Health and Human Services, 1996). Middle aged men and women who work in physically demanding jobs or perform moderate to strenuous recreational activities have a lower incidence of coronary artery disease than their less active peers (Powell 1987, Morris et al, 1990). Meta-analyses studies of clinical trials reveal that medically prescribed and supervised exercise can reduce mortality rates of persons with coronary heart disease (Hillsdon et al, 1995). Both short-term and long-term participation in exercise is associated with various indexes of psychological functioning. Active people are likely to be better adjusted (Eysenck et al, 1982), to show reduced cardiovascular responses to stress, (Crew and Landers, 1987) and to report fewer symptoms of anxiety and depression (Lobstein et al 1983).

New Zealand has the most atherogenic and thrombogenic profiles of all OECD countries due to our high intake of saturated fats, which makes up 16% of our total energy intake (Swinburn et al, 1998). The increasing prevalence of obesity from 11% in 1989 to 17 % in 1997, and a mean body weight increase of 3.2 kilograms (Ministry of Health, 1999) is consistent with our high total fat intake (35% of energy) and could suggest that we don't exercise enough. Likewise the 1996/7 New Zealand Health Survey found that 61% of adults took part in physical activity more than 2.5 hours per week and 15% of the population was sedentary. Those who were sedentary were more likely to rate their health as fair or poor and were more likely to be admitted to hospital (Ministry of Health, 1999). It has been estimated that one third of deaths in New Zealand from coronary heart disease, diabetes and some cancers can be attributed to lack of physical activity (Galgali et al, 1998). As diet and exercise are both modifiable

lifestyle factors, the information that people gain from health promotion organisations can have significant effects on the health of the population.

The present study focuses on a non-random group of New Zealanders over the age of forty years living in the Manawatu. The main focus of the study is to assess the awareness of health promotion messages from national health organisations and commercial organisations. From this information the awareness of national health promotion messages can be made and compared to the group's awareness of messages from commercial organisations. Information on their dietary intake, physical activity, fitness levels and health status was collected. The aim of collecting this data was to assess the overall health of the subjects and to draw conclusions whether their health status was reflected in their awareness of health promotion messages.

Chapter one discusses the present health guidelines for New Zealanders and compares them to the international guidelines. A summary of guidelines from commercial organisations will be presented. The scientific merit of the present health messages will be researched and then the present health state of New Zealanders from the most recent health surveys will be presented. Chapter two analyses the data and compares the results with similar research. Chapter three discusses the results and chapter four draws conclusions and recommendations from the health promotion awareness survey.

1.2 Guidelines from New Zealand national health organisations with regard to nutrition

The **Ministry of Health's** Food and Nutrition Guidelines for Adults is based on the Report of the Nutrition Taskforce: Food for Health (Department of Health, 1991). The Taskforce was appointed in September 1988 by the former Department of Health — now the Ministry of Health, with the support of the Minister. The taskforce consisted of experts in nutrition, public health, food technology, medicine and the food industry. The role of the taskforce was to make recommendations for a food and nutrition policy to develop specific nutrition goals and objectives. The Taskforce stated that its aim was: *“To recommend a food and nutrition policy which encourages nutritionally appropriate eating habits, promotes health and well-being, and which takes into account social, economic, ethnic and cultural factors”* (Department of Health, 1991).

The Taskforce consulted widely within New Zealand to consider the social, cultural, spiritual, economic and political issues as well as a wealth of scientific literature. The taskforce found that the major causes of death in New Zealand are cardiovascular diseases, some cancers, diabetes mellitus and alcohol-related diseases. In 1987 nutrition related diseases accounted for nearly 50% of all deaths and 30% of deaths under the age of 60. From this 27.7% was from coronary heart disease, 10% cerebrovascular disease, 2.6% colon cancer and 1.4% alcohol related diseases (National Health Statistics Centre, 1987). The Taskforce also reviewed a wide range of evidence from overseas with documents such as the US Surgeons General report on Nutrition and Health, 1988. The recommendations for adults are currently being reviewed and a new document is to be published in late 2000. The guidelines from the Ministry of Health are promoted and supported by other national health organisations including the **Heart Foundation**, **The New Zealand Cancer Society**, **Agencies for Nutrition Action**, the **New Zealand Nutrition Foundation** and the **New Zealand Dietetics Association**.

1.2.1 Guidelines from New Zealand national health organisations with regard to physical activity

In New Zealand the Sport Fitness and Leisure Act, 1987, established the Hillary Commission to help promote and develop sport, fitness and leisure amongst New Zealanders. The Hillary Commission for Sport Fitness and Leisure is the government body that supports sport and active living in New Zealand. The Commission creates opportunities for New Zealanders to be physically active, promoting sport as a code New Zealanders can all live by. The Hillary Commission has nine Commissioners based in Wellington and is funded by the Lottery Grants Board and Government.

In June 1997 the Minister of Sport, Fitness and Leisure directed the Hillary Commission to form a taskforce to develop strategies for increasing physical activity participation. This taskforce reported to the Minister in March 1998 with the Physical Activity Taskforce Report (1998). This is a framework for action for the support and promotion of physical activity and supports the health and well being message that there are significant health benefits from 30 minutes of physical activity on all or most days of the week.

Physical activity in short intermittent periods, at least 10 minutes of moderate intensity accumulating to a total of up to 30 minutes per day, will also have health benefits. This recommendation is supported by Haskell (1994), which shows that physical activity performed habitually and at a lower intensity will result in health benefits. The greatest increase in health occurs in shifting those who are sedentary to achieving some activity.

In April 1999 a joint policy statement by the Minister of Sport, Fitness and Leisure and the Minister of Health was published. The two ministers recognized that there were synergies between their two portfolios and agreed that a common agenda for the promotion of physical activity was important. The Ministers stated that the promotion of 30 minutes of moderate intensity physical activity on all or most days of the week was an important public health and well-being message. This led to the Hillary Commission launching a new programme called **Push Play**. This campaign is to put in place in New Zealand the Ministers statement of promoting 30 minutes of moderate intensity exercise per day. Sports trusts throughout New Zealand are pushing the new “snackactivity” message. The campaign is also being supported by the **Heart Foundation**, **Local Government NZ**, the **Health Funding Authority**, **Agencies for Nutrition Action**, the **YMCA** and many local gyms and community groups. All of these agencies promote and endorse the Push Play message. A detailed outline of the guidelines for nutrition and physical activity from public health organisations are presented in Table 1 (*page5*).

TABLE 1 Public Health Organisations

Name of Agency	Mission Statement	Nutrition Guidelines	Physical Activity Guidelines	Programmes to Support these Guidelines	Source
The Hillary Commission	All New Zealanders participating and achieving in sport, fitness and leisure.		Adults: Moderately active for at least 30 minutes per day or around 2.5 hours per week. Activity can be accumulated in short snacks throughout the day.	Push Play Green prescription He Oranga Poutama Kiwi Walks Community Sport Fund Working with Councils	The Hillary Commission today – Te Komihana Hakinakina a Hillary i Enei Ra. 2000.
The National Heart Foundation	To promote good health for all New Zealanders and to reduce suffering and early death from diseases of the heart and circulation.	The Heart Foundation endorses and promotes the New Zealand Food and Nutrition Guidelines. Currently the Foundation is working on its own set of guidelines due to be published in June 2000.	30 minutes of moderate physical activity on most days to provide health benefits. Beneficial physical activity not only includes the more demanding vigorous pursuits but also walking, dancing, gardening, cycling, bowls, golf, swimming and other similar activities. Significant health gains are attained by accumulating several periods of even 15 minutes of moderate activity during the course of most days. For those aspiring to increased fitness levels, the traditional message of 3x30 minutes of vigorous activity a week still applies.	Jump Rope for Heart Heartbeat Challenge Pamphlets and Brochures Pick the Tick Just Ask Heartbeat Catering School Food Programme	Heart Facts manual
Cancer Society of New Zealand		<ul style="list-style-type: none"> • Eat plenty of fruit, vegetables, bread, pasta, rice and breakfast cereals • Avoid eating too much fatty food • Avoid obesity • If drinking alcohol, do so in moderation 	At least 30 minutes of moderate activity on most, if not all days of the week. Moderate intensity activity includes such things as brisk walking, dancing and mowing lawns. These activities can be done in several sections rather than in a single 30 minute burst.		The Cancer Society of New Zealand Policy Statement

Name of Agency	Mission Statement	Nutrition Guidelines	Physical Activity Guidelines	Programmes to Support these Guidelines	Source
Minister of Sport, Fitness and Leisure and the Minister of Health				Promote their statement through the Hillary Commission.	Physical Activity: Joint statement by the Minister of Sport, Fitness and Leisure and the Minister of Health.
Agencies for Nutrition Action (ANA) ANA is an incorporated Society whose members are the Cancer Society, NZ Dietetic Association, NZ Nutrition Foundation, Te Hōtū Manawa Māori, National Diabetes Forum and the National Heart Foundation.	To work with other to increase the proportion of NZ'ers who maintain a healthy weight throughout life. To achieve this through the promotion of healthy lifestyles and environments that support good nutrition and physical activity.	ANA aims to encourage all NZ'ers to acknowledge and understand the importance of a healthy body weight for both quality and length of life. The group believes the goal of a healthy weight can best be achieved with appropriate messages and strategies, primarily involving young NZ'ers. ANA advocates a healthy lifestyle with regular activity and eating pattern based on appropriate food choices.	Support the Hillary Commission's Guidelines.	Mainly Fit Food Challenge. ANA works on a policy and promotional level holding forums, presenting research and co-ordinating Nutrition Action NZ.	ANA Mission Statement document.
Ministry of Health		Eat a variety of foods every day: <ul style="list-style-type: none"> • Plenty of fruit and vegetables and breads and cereals • Some milk and milk products • Lean meat, chicken, seafood, eggs, nuts, seeds and cooked dried beans Eat foods low in fat and salt. Have plenty of water and other drinks every day. If you drink alcohol, drink only a little.		Food and Nutrition Guidelines booklet series from pregnancy to the elderly.	Ministry of Health: Healthy eating for adult New Zealanders.

Name of Agency	Mission Statement	Nutrition Guidelines	Physical Activity Guidelines	Programmes to Support these Guidelines	Source
NZ Nutrition Foundation	To enhance the quality of life on NZ'ers by encouraging informed, healthy and enjoyable food choices.	The Foundation endorses the Food and Nutrition Guidelines for NZ.		<p>The Nutrition Foundation has the following principle services and products:</p> <ul style="list-style-type: none"> • Nutrition education • Policy • Nutrition promotion • Community action • Nutrition research <p>The Foundation works proactively in the nutrition and food sectors of the food industry, Ministry of Health, other health promotion agencies, schools and the media and is well respected as a credible voice on nutrition issues.</p>	Ministry of Health; Healthy eating for adult New Zealanders.
YMCA		No specific guidelines	Supports the Hillary Commission Push Play campaign		
NZ Dietetics Association		The Dietetics Association endorses the Food and Nutrition Guidelines for NZ.		The Dietetics Association does not have any programmes available to the public but acts as an advisory body	

1.2.2 Guidelines from New Zealand commercial organisations with regard to nutrition and physical activity

Sanitarium endorses the NZ Food and Nutrition Guidelines and has an extensive range of information available to the public. Many of their fact sheets and brochures on particular topics have extensive references to back up their statements. Their newsletters are reviewed by the Australian and New Zealand Nutrition Foundations and a team of nutritionists and dieticians are employed to advise the company and consumers with current nutrition information.

Kellogg's employs nutrition experts who provide nutritional guidance. They have significant influence on Kellogg's overall marketing and product development. Many of their brochures have references and a telephone number for their Nutrition Advisory Service if more in-depth information is wanted. Kellogg's also aligns itself to other organisations in Australia to develop and promote accurate and consistent information about nutrition and physical activity, enabling informed choices and contributing to a healthier life for all Australians. The National Heart Foundation of Australia, the Australian Council for Health, Physical Education and Recreation and Kellogg's have joined together to promote messages about children's health and fitness. A similar approach is currently underway for Kellogg's in New Zealand.

Heinz Wattie's, like Tararua, has the Heart Foundation "Pick the Tick" on many of its fruit and vegetable products and nutrient claims such as "97% *fat free*", which is found on many products. All of the nutritional claims are fully supported by current scientific data. Heinz Wattie's, like Sanitarium and Kellogg's, has a company in Australia as well as New Zealand. This could be perceived by the consumer as adding credibility to their products as their research and nutrition experts are often based in Australia with a smaller company branch operating in New Zealand. References to the health statements made by Heinz Wattie's are not included on their products or promotional material. The Appetite for Life promotion was run in conjunction with the New Zealand Nutrition Foundation, which has their logo on the promotional material. The promotion involved predominantly baked beans. The aim was to promote not only Heinz Wattie's foods as good foods for athletes but also to promote physical activity, a healthy weight and an overall balanced diet.

Tararua is the dominant milk supplier in the Manawatu. In the past Tararua obtained their research information from the Dairy Advisory Bureau. They presently have a Health and Nutrition Advisory Panel of six people who advise and consult on new products and issues that are relevant to the dairy industry and to Tararua having nutrient claims on their advertising material and products. Tararua has the Heart Foundation “Pick the Tick” logo on its Balance and Calcitrim milk that adds credibility to its product.

The former **Dairy Advisory Bureau** (DAB) was a source of credible information on dairy products and their role in health. The DAB supported and endorsed the National Nutrition Guidelines from the Ministry of Health. To ensure the information was correct and reliable the DAB conducted ongoing market research amongst consumers and health professionals and enlisted the expertise of leading health professionals from New Zealand and overseas in the development of its resources. The Dairy Advisory Bureau no longer exists, but this role will probably become the responsibility of individual dairy companies. A detailed outline of the guidelines for nutrition and physical activity from commercial organisations are presented in Table 2 (*page 10*).

NB: At the time that the health promotion awareness questionnaire was analysed the DAB was still in existence so data has been included for the purpose of this thesis.

TABLE 2 Commercial Organisations

Name of Agency	Mission Statement	Nutrition Guidelines	Physical Activity Guidelines	Programmes to Support these Guidelines	Source
Tararua	Dairy Company that is the main provider of dairy products in the Manawatu.	Tararua does not have specific nutrition guidelines but have the following claims on their products Calci~trim Milk – helps your bones stay good and strong Balance Milk – all the flavour with half the fat.	Tararua does not have specific physical activity guidelines but has a logo on their products of two people running suggesting they promote being active.	Tararua have their own marketing campaigns for these products and also obtain promotional material from the Dairy Advisory Bureau.	Tararua has a Health and Nutrition Advisory Committee who advise Tararua on health and nutrition issues.
Heinz Wattie's Australasia	Heinz Wattie's is committed to the production and marketing of foods which enhance the well-being and nutritional health of Australians and New Zealanders.	<p>Heinz Wattie's (HW) is dedicated to the development and manufacture of products of the very highest quality and nutritional content in conformance with the Australian and New Zealand Dietary Guidelines.</p> <p>HW's food products are modified in keeping with changes in nutritional knowledge while international trends and developments are continually monitored. All foods are developed and manufactured by the HW Nutrition Process to optimise nutrient retention. All nutrient claims are relevant to the role of the particular product in the total consumer diet.</p> <p>An accurate nutritional message is always communicated and all nutritional claims are fully supported by current scientific data. HW promotes nutrition research and is committed to the advances of nutritional sciences.</p> <p>HW supports and assists authorities in establishing and reviewing food regulations. The formulation of HW products is in conformance with food legislative requirements. HW products are formulated with regard to the diet of the target market.</p>		<p>Food labelling is the main way that consumers receive nutritional messages.</p> <p>Pick the tick.</p> <p>Pamphlets, posters and displays promote nutrition across all HW categories.</p> <p>HW funds and supports an Infant Nutrition Advisory Group, which releases a newsletter once every two months. Infant feeding videos and pamphlets on baby products and formulas.</p> <p>Appetite for Life promotion.</p> <p>Sponsorship of NZ Ironman.</p> <p>HW customer service lines.</p>	

Name of Agency	Mission Statement	Nutrition Guidelines	Physical Activity Guidelines	Programmes to Support these Guidelines	Source
Sanitarium	We improve health in our community by providing nutritious and innovative foods of superior value. In doing so we provide significant contribution to the humanitarian work of the Seventh-day Adventist Church.	Sanitarium promotes and endorses the New Zealand Food and Nutrition Guidelines.	Sanitarium promotes and endorses the Hillary Commission's Push Play message that, "regular, moderate activity for 30 minutes on most days will bring about health benefits.	Sanitarium has a Nutrition Education Service which takes between 800-1,000 calls and letters per month on nutrition related questions. Services include: <ul style="list-style-type: none"> • Fact sheets • Recipe books • Recipe leaflets • Quarterly newsletters • School project material 	Sanitarium Nutrition Education Service.
Dairy Advisory Bureau	The Dairy Advisory Bureau (DAB), as part of New Zealand Milk's Nutrition and Health Group, uses innovative nutrition marketing, advertising and education campaigns on the domestic market to develop global capabilities in health professional communication.	The DAB actively communicates the following health benefits to consumers including nurturers of toddlers and teenagers, adults and older people who influence dietary choices, especially health professionals: <ul style="list-style-type: none"> • Dairy products provide children with essential nutrients for growth and development of strong teeth and bones. • Dairy products are one of the best sources of calcium required to build and maintain strong bones and it is never too late to start. • Milk and dairy products have an important role to play in a balanced diet and can be part of a healthy diet. 			DAB background information sheet 2000.

Name of Agency	Mission Statement	Nutrition Guidelines	Physical Activity Guidelines	Programmes to Support these Guidelines	Source
Kellogg's	Kellogg is a global company committed to building long term growth in volume and profit and to enhancing its worldwide leadership position by providing nutritious food products of superior value.	<p>Specific marketing information is not available for New Zealand at present.</p> <p>Many of their brochures produced for Australia are available in New Zealand. Reference to the Food Pyramid is made and eating a balanced diet based on the Food and Nutrition Guidelines.</p>		Kellogg's is active in the community with a range of brochures for consumers providing information about a variety of topics, including the importance of fibre, the role breakfast, the importance of folate and sports nutrition. An Update Newsletter provides a summary of recent nutrition research findings to the media and health officials.	Kellogg's Commitment to Nutrition Publication.

1.3 Scientific merit of health messages

1.3.1 Scientific merit of nutrition messages

Although death from coronary heart disease has fallen significantly in the past three decades it remains the single leading cause of death worldwide (Murray and Lopez, 1997). Epidemiological, clinical and metabolic research has clearly established that diet plays a significant role in health promotion and disease prevention (US Dept of Health and Human Services, 1991). As an example of this a study of Seventh-Day Adventist men who adhere most closely to the religion's health promoting diet of no smoking, alcohol, coffee and who are vegetarian, have the lowest mortality rates amongst US men from any cause (Lindsted et al, 1991). Diseases such as atherosclerosis and hyperlipidemia are strongly related to the consumption of saturated fat and to a lesser extent, cholesterol (Nutrition Committee, 1993, National Research Council, 1991). These studies have shown that atherosclerotic lesions in coronary arteries are raised by diets high in total and saturated fat but decreased by diets that replace saturated fat with polyunsaturated and monounsaturated fat.

Obesity described as "an excess of body fat frequently resulting in a significant impairment of health" (Blair et al, 1996), is also associated with cardiovascular disease and certain cancers, diabetes osteoarthritis and reduced longevity. Body mass index or BMI (weight in kg/height in m²) is the method for assessing whether adults are obese or overweight. A BMI of 25–30 has conventionally been considered overweight while a BMI of greater than 30 is considered obese. However there is now evidence to support that a BMI of 22 is considered healthy. Kannel et al (1996) reported that after 26 years of followup on the Framingham study, each standard deviation increment in relative weight was associated with 15% and 22% increases in cardiovascular events in men and women, respectively. They suggested that the optimal weight for avoidance of cardiovascular disease and prolonging life is a BMI of 22.6 for men and 21.1 for women. Similarly Shaper et al (1997) found that the risk of cardiovascular death, heart attack and diabetes increased progressively from an index of < 20 after adjusting for social class, alcohol consumption, age and physical activity. They concluded that a healthy body mass index for British men seems to be around 22. Many countries have reported an excess mortality associated with obesity (Bray, 1985). However, obesity

was identified as an independent risk factor for coronary heart disease in the Framingham study and also for stroke in women (Hubert et al, 1983). Several other large studies have identified obesity as an important factor in heart disease prevalence. The Nurses Health Study (Manson et al, 1990) prospectively followed up more than 100,000 women and found that the 14-year mortality rate for those with a BMI of greater than 32 was more than double that for women with a BMI of less than 19. In the Health Professionals Follow-up Study (Rimm, 1995), which followed up to 29,000 men for 3 years, the subjects who were classified as mildly obese (BMI, 25.0–28.9) had a 50% higher risk of coronary heart disease (CHD) than those with a BMI of less than 23.0. Moderate obesity (BMI 29.0–32.9) and severe obesity (BMI > 33) were associated with nearly 2-fold and more than 3-fold increases, respectively in CHD risk. Obesity is influenced by diet composition and density, i.e. reducing fat intake as a percent of total calories and invariably exercise plays a role in the prevention of obesity (Miller et al, 1990).

1.3.2 Scientific Merit of Physical Activity Messages

There has been a tremendous amount of research regarding the role of increased physical activity in regard to the prevention of coronary heart disease. The positive effects of exercise are becoming well known and a range of cardiovascular, metabolic and hormonal benefits has been identified. There is agreement that physical activity provides some protection against coronary heart disease. Individuals who participate in sport have been found to have significantly lower blood pressure, better self-rated health status and a lower average body mass index (Lamb et al, 1991). Research also suggests that regular physical activity helps to control body weight, protect against certain cancers, osteoarthritis, osteoporosis, hypertension, anxiety and depression (Blair et al, 1992, BERL 1993, Powell et al, 1991).

A meta-analysis of physical activity in the prevention of coronary heart disease was published in 1990 (Berlin and Colditz) based on the work by Powell et al (1987). The authors produced a thorough review of this topic. They attempted to make formal quantitative statements and to explore features of study design that influence the observed relation between physical activity and coronary heart disease risk. Summaries of the characteristics and findings from 27 cohorts of the relation of physical activity to

coronary heart disease were investigated. Cohort size was generally large ranging from the Finnish men's study of 636 people to the US Railroad workers study of 191,609 people. The results of the meta-analysis showed an association between a lack of physical activity and increased risk of coronary heart disease. The association was stronger when a high activity group in a study was compared to a sedentary group rather than when comparing them to a moderate activity level group. Issues were raised about defining, low, moderate and high activity levels in various studies and could explain the lack of association between CHD risk and activity levels. In some studies it was found that the so called "active" group were relatively inactive. The authors concluded that the protective effects of physical activity lie in the prevention of major cardiovascular events rather than a reduction in the severity of events that do occur. This association could be having a considerable public health impact, as cardiovascular disease is the leading cause of death in the United States. With a high rate of people classed as sedentary a large number of deaths may be avoidable.

The American College of Sports Medicine (ACSM, 1990), recommended that training should occur 3–5 days per week at an intensity level of 60–90% of maximum heart rate and be between 20–60 minutes of continuous aerobic activity. The mode should be activities that use large muscle groups and can be maintained continually, such as swimming, running/jogging, stair climbing and walking. The ACSM suggested that training for less than two days per week at less than 50% of maximum oxygen uptake and for less than 10 minutes per day was inadequate for developing and maintaining fitness for healthy adults.

In 1994 Haskell presented a paper that examined the 1990 ACSM position paper and addressed the issues of a need for a paradigm shift to change from the need to exercise to promote physical fitness versus physical activity to promote health. Some of the issues that were addressed are of studies where favourable health outcomes have occurred when exercise has been performed on a more intermittent than a continuous basis. Activities such as gardening, stair climbing and household chores are more frequently included than conditioning activities such as jogging, cycling and playing tennis. The greatest health benefits occur when the least active become moderately active. Haskell suggests that a series of short activities spread throughout the day, if

they total more than 30 minutes or longer will provide significant health benefits compared to exercising continuously for 20 minutes or longer. Haskell notes that this paradigm shift is based as much on concept and assumption as on well-established scientific fact. However, the paradigm is given validity on the established fact that a generally more active lifestyle is associated with better health.

Blair and Connelly (1996) reviewed and summarized evidence from different research studies to make recommendations about the type and amount of physical activity needed for overall good health and function. They concluded that some activity is better than no activity and low to moderate-intensity activity is better than remaining sedentary. They also suggest that greater amounts of activity or fitness and perhaps higher intensity activity provide greater benefits for the reduction of clinical disease than lesser amounts. Although more research is needed into the benefits of exercising in shorter periods over the day the research so far is promising for sedentary adults who may be intimidated by accumulating exercise in one period. Evidence suggests that the minimum time is 10 minutes but the efficacy of periods any less than this remains to be established.

The significant **US Surgeon General's Report** released in July 1996 (Manley, 1996) was regarded as the most significant health report in America since the 1964 Surgeon General's report on smoking which led to health warnings on cigarette packets. The major purpose of the report was to raise concern about the low levels of physical activity in Americans and to initiate new recommendations for participation levels in activity. According to the report regular physical activity improves health in the following ways:

- Reduces the risk of dying prematurely.
- Reduces the risk of dying from heart disease.
- Reduces the risk of developing diabetes.
- Reduces the risk of developing high blood pressure.
- Helps reduce blood pressure in people who already have high blood pressure.
- Reduces the risk of developing colon cancer.
- Reduces the risk of depression and anxiety.

- Helps control weight.
- Helps build and maintain healthy bones, muscles and joints.
- Helps older adults become stronger and better able to move without falling.
- Promotes psychological well-being.

The report is extensively backed by research. The recommendations from the Surgeon's report were derived from similar findings from the Centres for Disease Control and Prevention (1993) and the American College of Sports Medicine (1990). Their recommendations were that every American should accumulate 30 minutes or more of moderate-intensity physical activity over the course of most days of the week. Types of activities that can make up the activity for the day include walking, gardening, stair walking or more planned exercise forms such as tennis, jogging, cycling and swimming. These recommendations are also consistent with recommendations from other agencies including The Heart Foundation of New Zealand (Arroll, Swinburn, Russell & Libbe, 1994).

1.4 International Guidelines

1.4.1 International Dietary Guidelines

The dietary guidelines from several countries is presented in Table 3 below to assess whether our guidelines are consistent with dietary guidelines from overseas.

Table 3: National Nutrition Guidelines from New Zealand, USA, Australia and the UK

The Food and Nutrition Guidelines for New Zealanders (Department of Health, 1991)	The Dietary Guidelines for Americans (Kennedy, 1996)	The Dietary Guidelines for Australians (Rogers, 1995)	The Dietary Guidelines for the United Kingdom (Health Development Agency, 2000)
<p>Eat a variety of foods from the four major food groups each day.</p> <p>Prepare meals with minimal added fat (especially saturated fat) and salt.</p> <p>Choose pre-prepared foods, drinks and snacks that are low in fat (especially saturated fat), salt and sugar.</p> <p>Maintain a healthy body weight by regular physical activity and by healthy eating.</p> <p>Drink plenty of liquids each day.</p> <p>If drinking alcohol, do so in moderation.</p>	<p>Eat a variety of foods.</p> <p>Balance the food you eat with physical activity – maintain or improve your weight.</p> <p>Choose a diet with plenty of grain products, vegetables and fruits.</p> <p>Choose a diet low in fat, saturated fat and cholesterol</p> <p>Choose a diet moderate in salt and sodium.</p> <p>If you drink alcoholic beverages, do so in moderation.</p>	<p>Eat a wide variety of nutritious foods.</p> <p>Eat plenty of breads and cereals (preferably wholegrain), vegetables (including legumes), and fruits.</p> <p>Eat a diet low in fat, and in particular low in saturated fat.</p> <p>Maintain a healthy body weight by balancing physical activity and food intake.</p> <p>If you drink alcohol, limit your intake.</p> <p>Eat only a moderate amount of sugars and foods containing added sugars.</p> <p>Choose low salt foods and use salt sparingly.</p> <p>Encourage and support breastfeeding.</p> <p><i>Guidelines on specific nutrients.</i></p> <p>Eat foods containing calcium.</p> <p>Eat foods containing iron.</p>	<p>Enjoy your food.</p> <p>Eat a variety of different foods.</p> <p>Eat the right amount to be a healthy weight.</p> <p>Eat plenty of food rich in starch and fibre.</p> <p>Don't eat too many foods that contain a lot of fat.</p> <p>Don't have sugary foods and drinks too often.</p> <p>Look after the vitamins and minerals in your food.</p> <p>If you drink alcohol, drink within sensible limits.</p>

1.4.2 Comparison of Guidelines

This section compares the New Zealand Food and Nutrition guidelines (*italicised bullet points*) with to the American, Australian and United Kingdom dietary guidelines.

- *Eat a variety of foods from the four major food groups each day.*

This is stated in all of the guidelines with NZ being the only country to mention the four major food groups. America and Australia state more specifically what this means by stating to have a diet with plenty of grain products, fruit and vegetables.

- *Prepare meals with minimal added fat (especially saturated fat) and salt.*

This is noted in all of the guidelines.

- *Choose pre-prepared foods, drinks and snacks that are low in fat (especially saturated fat), salt and sugar.*

America has one guideline for fat and one guideline for salt. Australia has a guideline for reducing salt and one for reducing sugar and the United Kingdom has a guideline about reducing sugar but nothing about salt.

- *Maintain a healthy body weight by regular physical activity and by healthy eating .*

Both America and Australia have similar guidelines. The UK does not mention physical activity in its Nutrition Guidelines but states to eat the right amount to be a healthy weight.

- *Drink plenty of liquids each day.*

This guideline is not mentioned in countries other than New Zealand.

- *If drinking alcohol do so in moderation.*

This guideline is mentioned in all other countries.

Other guidelines that are not mentioned in the NZ guidelines are from Australia to encourage and support breastfeeding and the United Kingdom to look after the vitamins and minerals in food.

Overall the dietary guidelines for other countries are similar to the NZ guidelines. What is not known is how these guidelines are promoted to the general public and it is difficult to say how these are understood by the general public without knowing what other information and promotional material goes with them. Common themes of fat, salt, sugar and alcohol are prevalent in all the countries' guidelines as are eating a variety of foods as they are related to risk of heart disease, obesity and some cancers.

1.4.3 International Physical Activity Guidelines

A comparison of the physical activity guidelines from several countries is presented below in Table 4 to assess whether our guidelines are consistent with overseas physical activity guidelines.

Table 4: Physical activity guidelines from New Zealand, USA, Australia and the UK

Physical activity policy statement for NZ (Ministry of Health, 1999).	Physical activity guidelines for USA (National Institute of Health, 1995).	Physical activity policy statement for Australia (Australian Sports Commission, 2000).	Physical activity policy for the UK (Health Development Agency, UK, 2000).
There are significant benefits from 30 minutes of moderate-intensity physical activity on all or most days of the week. Short intermittent periods of physical activity (of at least 10 minutes), accumulated over a day to total at least 30 minutes, also have health benefits if performed at a level of moderate intensity. Increasing physical activity is recognised as important to improve the well being of all New Zealanders, and to reduce health care cost associated with inactivity.	We recommend that all people in the United States increase their regular activity to a level appropriate to their capacities, needs and interest. We recommend that children and adults should set a long term goal to accumulate at least 30 minutes or more of moderate-intensity physical activity on most, preferably all days of the week. Intermittent or shorter bouts of activity (at least 10 minutes), including occupational and non-occupational, or tasks of daily living, also have similar cardiovascular and health benefits if performed at a level of moderate-intensity with an accumulation of at least 30 minutes per day. People who currently meet the recommended minimal standards may derive additional health benefits from becoming more physically active or including more vigorous activity.	There are now consistent recommendations that all adults should set a long-term goal to accumulate at least 30 minutes of moderate intensity physical activity on most, preferably all, days. Participation in vigorous forms of physical activity can confer additional benefits and remains important for people who are able and willing to undertake this level of activity. Physical activity which is of low to moderate-intensity can help people feel good and improve their health. The 30 minutes does not have to be done all at once. Activity can be accumulated in smaller bouts of 10 minutes or more, allowing people to incorporate regular exercise into their normal daily lives.	Adults are encouraged to build up over time to half an hour of physical activity a day – always remembering that any activity is better than none at all. Take 30 minutes of moderate-intensity physical activity such as a sustained brisk walk on at least 5 days of the week. Ideally these 30 minutes should be in one period of sustained activity, but shorter bouts of 15 minutes can also be beneficial. Young people aged 5-16 should participate in physical activity of at least moderate-intensity for one hour per day. They should incorporate a range of enjoyable activities throughout the day. Although one hour per day is recommended, half an hour is a good way to start.

1.4.4 Comparison of international physical activity guidelines

Table 4 shows that the recommendations from the various countries are very similar and are all based on the US Surgeons General Report (Manley 1996). **The main message is that physical activity should be for at least 30 minutes per day.** The United

Kingdom states that the ideal is 30 minutes but differs in that the minimum time is 15 minutes of physical activity not ten minutes. The UK also has a separate recommendation for 5–16 year olds whereas the other countries do not make any distinction between adults and children. Hence the Hillary Commission is recommending guidelines that are current and appropriate to guidelines recommended in other countries.

1.5 Current New Zealand Nutrition and Physical Activity Status

1.5.1 Nutrition

The most recent national survey in nutrition is the **1997 National Nutrition Survey** (Ministry of Health, 1999), which provided information on food and nutrient intakes, dietary habits and nutrition related clinical measures of 4,636 New Zealanders over the age of 15 years. The survey aspect relevant to this research consisted of a 24-hour diet recall, food-related questions and physical measurements. Some of the key findings of the survey when compared to the 1989 Life in New Zealand Survey were that:

- Percent contribution to energy from fat had fallen from 37.5% to 35%.
- Body weight had increased by 3.2kg.
- Obesity levels defined as a BMI > 30 kg/m² had risen from 11 to 17 %. Central obesity as measured by the W/H ratio excess had risen from 27.4% to 41.4 %.
- 35% of the population was considered overweight defined as BMI > 25 kg/m².
- Some changes in food choices reflected dietary guidelines such as an increased consumption of pasta and rice. However, a decrease in the consumption of many vegetables was also reflected.

1.5.2 Physical activity

The most recent national survey in physical activity is the **1996/7 NZ Health Survey: Taking the Pulse** (Ministry of Health, 1999). The health survey provided information on selected health risk behaviours such as smoking, physical activity, the health status of New Zealanders, the utilisation of health services and prescription and individuals' knowledge and experience of health services. It was a nationally representative survey

of 7,862 adults and 1,019 children. The questions related to physical activity were influenced by the recent emphasis on the benefits of regular moderate physical activity rather than vigorous exercise. Hence, subjects were questioned on the frequency and duration of physical activity rather than intensity.

Subjects were classified into either, 1) Inactive: took part in less than 2.5 hours of leisure time physical activity in the previous seven days, or 2) Active: took part in more than 2.5 hours of leisure time physical activity in the previous seven days. A separate category was also provided for those who took part in any vigorous leisure time physical activity defined as sufficient to make you breathe hard or sweat.

The key findings in the physical activity sections were that:

- 61% of adults took part in 2.5 hours or more of leisure time physical activity.
- 15% of all adults were sedentary.
- 47% of all adults took part in vigorous physical activity.
- Younger people are more likely to participate on vigorous physical activity than older people.
- The most popular form of physical activity was walking, followed by gardening and exercising at home.

A key measure from the survey was that 61% of the group was able to meet the Hillary Commission and Ministry of Health Guidelines recommending that people participate in at least 30 minutes or more of moderate level physical activity nearly every day.