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

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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 m^2) 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).

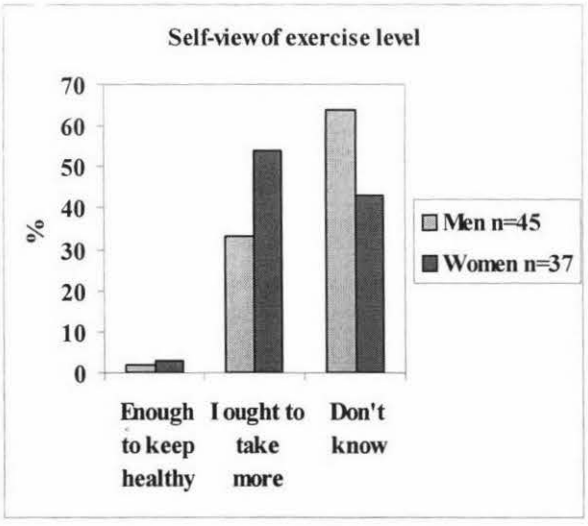
Black, A.E., Bingham, S.S., Johansson G., Coward, W.A. (1997). Validation of dietary intakes of protein and energy against 24 hour urinary N and DLW energy expenditure in middle-aged women, retired men and post-obese subjects: comparisons with validation against presumed energy requirements. European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

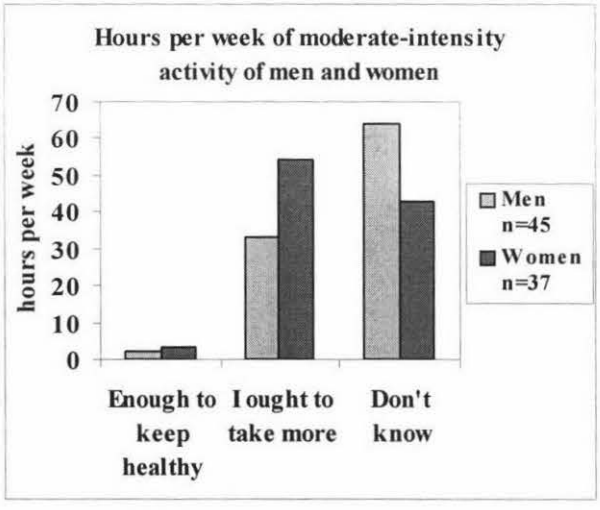
3. p.27. Omit last sentence as it is repeated from p.26, 2.2.2, line 6.

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 he 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 lead 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		• 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 Caner Society, NZ Dietetic Association, NZ Nutrition Foundation, Te Hotu Manawa Maori, 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: • 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.		The Nutrition Foundation has the following principle services and products: • Nutrition education • Policy • Nutrition promotion • Community action • Nutrition research 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.	Ministry of Health; Healthy eating for adult New Zelanders.
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 it 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 commited to the production and marketing of foods which enhance the well-being and nutritional health of Australians and New Zealanders.	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. 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. 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. 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.		Food labelling is the main way that consumers receive nutritional messages. Pick the tick. Pamphlets, posters and displays promote nutrition across all HW categories. 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. Appetite for Life promotion. Sponsorship of NZ Ironman. HW customer service lines.	

Name of Agency	Mission Statement	Nutrition Guidelines	Physical Activity Guidelines	Programmes to Support these Guidelines	Source
Santitarium	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.	Sanitaruim 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: • Fact sheets • Recipe books • Recipe leaflets • Quarterly newsletters • School project material	Sanitarium Nutrition Education Service.
Dairy Advisory Bureau	The Diary 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: • 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.	Specific marketing information is not availabe for New Zealand at present. 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.		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 m^2) 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 heath.

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

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/m^2 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/m^2.
- 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.

Chapter 2

Awareness of health promotion messages in a non – random group of New Zealanders

2.1 Introduction

During 1998 and 1999 a variety of information was collected from three dietary intervention studies by the Human Nutrition Studies team at Massey University, Palmerston North. Studies were concerned with the impact of nutrients on blood pressure or bone health. The baseline data consisted of:

- a one day dietary recall,
- a fitness test,
- a urine analysis,
- a body composition assessment,
- a physical activity questionnaire,
- SF-36 health status questionnaire,
- an habitual physical activity questionnaire.

Approximately one hundred and thirty adults over the age of forty took part in these studies. The reason that this data were used is that there was a great deal of information available on the lifestyle patterns of the subjects and I was interested to research the hypothesis that, are people who are healthy aware of health promotion messages. For example one may conceive that there are two groups of individuals amongst the data. Group A are individuals who are aware of health promotion messages. Group B are individuals who are healthy. The question posed is to what extent is there an overlap between individuals in each group. A typical scenario would be for people to be aware of health promotion messages but choose not to act on them for various reasons.

The purpose of the present thesis, the Health Promotion Awareness Study (HPAS) was to assess the awareness of health promotion messages from national and commercial organisations amongst this group of adults living in the Manawatu. A secondary aim of the thesis was to compare the lifestyle habits of subjects living in the Manawatu with those reported in national surveys. From this information, some conclusions can be

made about the effectiveness of health messages from national and commercial organisations.

2.1.1 Methodology

Data were collected from 130 subjects. Some did not complete all the questionnaires and the data of those people who took part in more than one study were used only once. One man aged 84 years was omitted from the analysis as the next closest man was aged 78 and I thought that his data would affect the results. Table 5 below, summarises the total number including men and women that took part in each questionnaire/test.

Table 5: Numbers who took part in each test/questionnaire.

Test/questionnaire.	Total	Men	Women
24-hr dietary recall	104	41	63
Fitness test	100	32	68
Urine analysis	104	41	63
Body composition assessment	115	43	72
Physical activity questionnaire	82	45	37
Health status questionnaire SF-36	72	40	32
Habitual physical activity questionnaire	108	42	66
Health promotion awareness questionnaire	69	25	44

Subjects voluntarily responded to an advertisement in the Massey newsletter or through advertisements in the local newspaper and radio. The individuals were drawn from Palmerston North, Levin, Foxton and Feilding as well as rural communities with an approximate 50km radius of Palmerston North. Hence subjects were a non-random group. Three people were Maori, but all other subjects were of European origin. Massey University's Human Ethics Committee approved the study.

2.2 Description of data collected

2.2.1 Health Promotion Awareness Study (HPAS)Questionnaire.

Approval from the Massey University Human Ethics Committee was granted prior to the questionnaire being sent out, as this was an extension to the original project. The questionnaire (Appendix 1) was sent to 104 subjects and 69 responded, which was just over a 50% response rate. This was the first mail questionnaire that the group completed as the rest of the data had been collected in the laboratory where the subjects

were interviewed. I asked the subjects to complete the questionnaire in two weeks time that they returned in a self-addressed envelope. Subjects were sent a letter with the questionnaire (Appendix 2) stating that completion of the questionnaire was voluntary. The subjects were categorised into men and women but not into separate age groups as the numbers in each age group were too small. The number of responses was then expressed as percentages. The HPAS questionnaire was divided into two sections. The aim of the first section was to find out what knowledge and awareness the subjects had of national health organisations and the programmes and health messages that these organisations had available to the public. They were also asked to record what these messages were. The subjects were asked if they knew or had an idea what the various health organisations recommended in regard to diet and exercise. For example, what does the Hillary Commission say about the amount of exercise we should be doing per day? To obtain a score the subjects had to answer that the Hillary Commission recommends 30 minutes of exercise per day, on all or most days of the week. The time of 30 minutes and days per week had to be stated by the subjects. A list of the more well-known and major national health organisations in New Zealand was given to subjects to assess their knowledge of them. Organisations such as the Hillary Commission, the Heart Foundation, Cancer Society and the YMCA were some of the examples listed. The second part of the questionnaire asked the subjects whether they felt that leading a healthy lifestyle was important to their health and whether they took note of health messages from commercial companies and national health promotion organisations. Subjects were asked to state whether commercial or national messages are more widely available to the public and what messages they were more likely to act upon. Examples of commercial organisations that were listed in the questionnaire were Kellogg's, Wattie's, Sanatarium, Tararua, sports drinks and gyms. The commercial organisations were chosen because they are examples of companies who have a wide range of products that most New Zealanders would be familiar with and they all have some sort of health message for the consumer. Many of these companies products are also regarded as "healthy". No separate reference was made to commercial fitness organisations such as the name of any gym or health and fitness club as the subjects were living in separate parts of the Manawatu and there was no one commercial fitness

organisation that they would receive health messages from. Hence, the word gym was used to encompass all of these organisations.

Since only 69 of the 104 subjects in the main study returned the HPAS questionnaire, it was of interest to assess if this was a representative sample of the overall group. A further comparison of the results has been made to assess if there was any difference in baseline results between subjects who responded to the HPAS questionnaire as compared to those who did not. The subjects who responded to the mail questionnaire were probably more motivated to take part and the author was interested whether this motivation was reflected in baseline data results for daily nutrient intake and physical characteristics.

2.2.2 24-hr dietary recall

Usual food intake was measured using a detailed 24-hour food intake recall. The food intakes were then analysed for macro and micronutrients using the New Zealand Food Composition Table that was assessed using nutrient analysis software (FOODworks v2, Xyris Software (Australia) Pty Ltd, Highgate Hill, QLD, Australia). Under-reporters were identified by comparing dietary intake of protein from which dietary nitrogen intake was calculated against nitrogen excretion from urine samples. Basal metabolic rate was calculated using Schofield's equation (1985) from measurements of height, weight and age. Under-reporters were identified by a cut-off test for urine; N:N>0.8 and EI<1.47 x estimated BMR. There were 29 under-reporters for both protein and energy intake which made up nearly one third of the group. It was decided not to adjust the data or omit these subjects from the trial as they made up a large proportion of the group and there was also no correction for under-reporting made in the National Nutrition Survey. Hence by not correcting the data it could be directly compared to the National Nutrition Survey.

2.2.3 Fitness tests

To assess physical fitness a submaximal exercise test was used. Subjects exercised for three consecutive workloads, for three minutes each, using a cycle ergometer (Monark Ergomedic 818E, Monark Bodyguard, Sweden). Heart rate was measured by telemetry

during the last 15 seconds of each workload using the Minimitter data logging device (Mini-logger series 2000, Mini Mitter, Sunriver, Oregon, USA). Oxygen consumption was calculated at each workload using a validated predictive equation. Maximum oxygen consumption ($\dot{V}O_{2max}$) was estimated using linear regression of heart rate (Latin et al, 1993), and oxygen consumption. It was assumed that maximum heart rate was 220 - age in years. Physical work capacity at a heart rate of 170 beats per minute (PWC 170,) was calculated using linear regression of heart rate at three separate work loads.

2.2.4 Body composition assessment

Bodyweight was measured using a beam balance (Detecto, Cardinal Scale Manufacturing Co, Webb City, MO, USA) to the nearest 0.2kg and standing height was measured using a stadiometer to the nearest 0.1cm. Central obesity was assessed by calculating the waist:hip ratio from measurements of waist and hip circumference using a non-stretch tape measure, with measurements recorded to the nearest 0.1cm. Lean body mass was measured by total bioelectrical impedence (Biodynamics Model 310, Seattle Washington, USA) after at least three hours without food or drink. Body mass index, (BMI kg/m^2) was calculated by dividing height in kilograms by height in metres squared. Midarm circumference was measured to the midpoint between the acromial and olecranon processes on the non-dominant arm, also using a non-stretch tape measure with measurements recorded to the nearest 0.1cm. Maximal handgrip of the non-dominant arm was measured using a handgrip dynamometer (Lafayette Model 78010, Indiana, USA). Triceps skinfold was measured to the nearest tenth of a millimetre using a Harpenden Skin-fold calliper having a pressure of $10g/mm^2$ of contact surface area. The measurement was taken on the back of the arm and midway between the point of the acromion and olecranon process while the arm was hanging relaxed. Arm muscle area was calculated by pie/4(arm diameter^2), (Frisancho, 1974). Basal metabolic rate was calculated using the Schofield's equation (1985) from measurements of height, weight and age.

2.2.5 Physical activity questionnaires

Two questionnaires were used:

a) Physical Activity:

This questionnaire developed by Paffenbarger et al (1992) was used to determine physical activity patterns. Subjects are asked about the type, frequency and intensity of exercise they do. Data were collected on walking and stair climbing, recreation and sport play pursuits and the frequency and duration patterns for vigorous, moderate, light, sitting and reclining activities on a usual week and weekend day. Intensity of effort can be derived from questions about walking pace and subjective estimates of the Borg scale of self-assessed perceived exertion (Borg, 1973). Energy expenditure, expressed as METs can be calculated to give an idea of the energy cost of activities.

b) Habitual Physical Activity:

This questionnaire developed by Baecke et al (1982), consists of 22 items concerned with physical activity at work, sport and leisure time. All responses are pre-coded on five point scales with the exception of the name of main occupation and types of sport played. Indices of physical activity were established (using a mean score index) for occupational physical activity, sport during leisure time and physical activity during leisure time. These indices enable comparisons to be made between groups and individuals.

2.2.6 SF-36 Health status questionnaire

The SF-36 (Ware and Sherbourne, 1992), measures self-reported health in relation to eight health concepts: physical functioning, role limitations due to physical health, bodily pain, general health perceptions, vitality, social functioning, role limitation due to emotional health and general mental well being. Responses to the 36 questions are scored and summed into eight scales from zero to one hundred, relating to each of the health concepts. Higher scores represent better self-reported health status.

2.2.7 Limitations

The study had the following limitations:

a) Subjects were not randomly selected in that they were motivated to answer an advertisement and go to the laboratory at Massey University to take part in the trials. Therefore this was not intended to be a representative sample of people over 40 years of age living in the Manawatu. For the other studies that the data are compared to subjects were randomly chosen.

b) Most of the data were collected only once so limited retesting occurred to assess the reliability of the data. There were two one-day dietary recalls and body composition assessments and an average of the two assessments was used to analyse the data but for the other assessments and questionnaires only one assessment was undertaken.

c) The majority of subjects were Pakeha (3 Maori) and all were non-smokers.

d) Data were not corrected for under-reporting.

2.3 Results

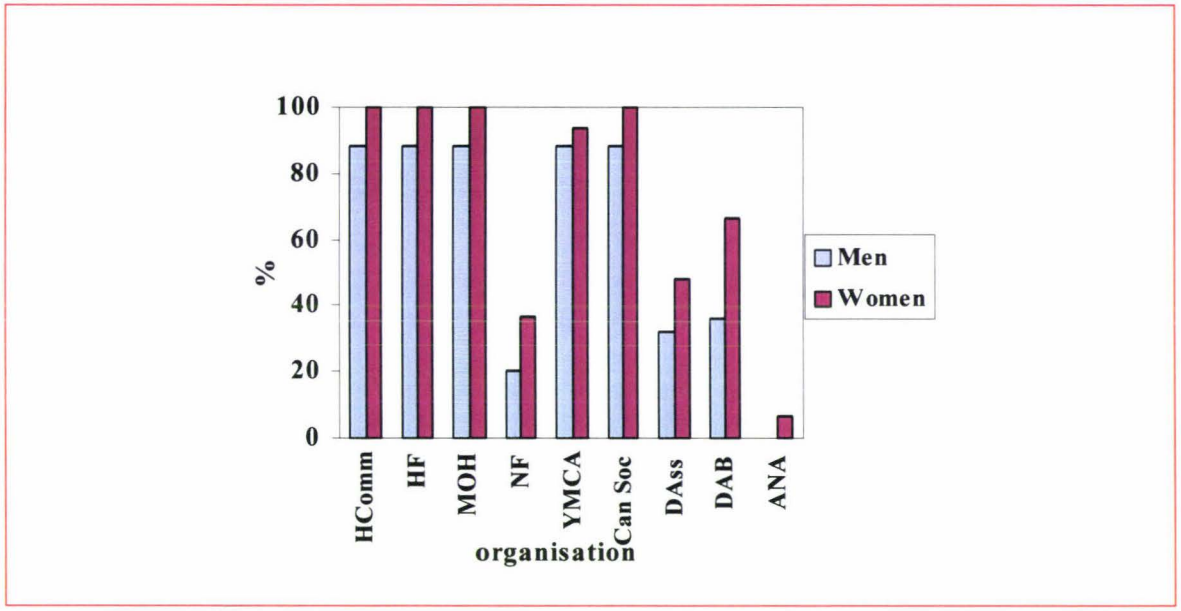
Data are presented with the mean and standard deviation for the total group and subdivided into categories for men and women aged 40–49, 50–59 and 60+ years of age. Data for the range of quartiles from lowest to highest is also presented. Statistics were analysed using Minitab v12 with a p value of < 0.05 as the criterion for statistical significance. Analysis of covariance was used to calculate the difference in age groups and t-tests were calculated to assess the differences between men and women. Please refer to the appropriate table in appendix 4 for results. The search strategy that was used to identify systematic reviews and meta-analyses was the University of York Comprehensive Medline Strategy (2000).

2.3.1 Health Promotion Awareness Questionnaire

Data are provided in full in **Table 1 Appendix 4, page 68.**

Of the nine national health organisations listed, the ones that had the highest awareness were the Hillary Commission (HComm), Ministry of Health (MOH), The Heart Foundation (HF) and the Cancer Society (CS) all scoring 96%. The YMCA scored 92%. The Dairy Advisory Bureau (DAB), Nutrition Foundation (NF) and Dietetics Association (DAss) were overall more well known by women than men and Agencies for Nutrition Action (ANA) had a very low awareness by the group of 4% (Figure 1).

Figure 1: Awareness of Health Organisations

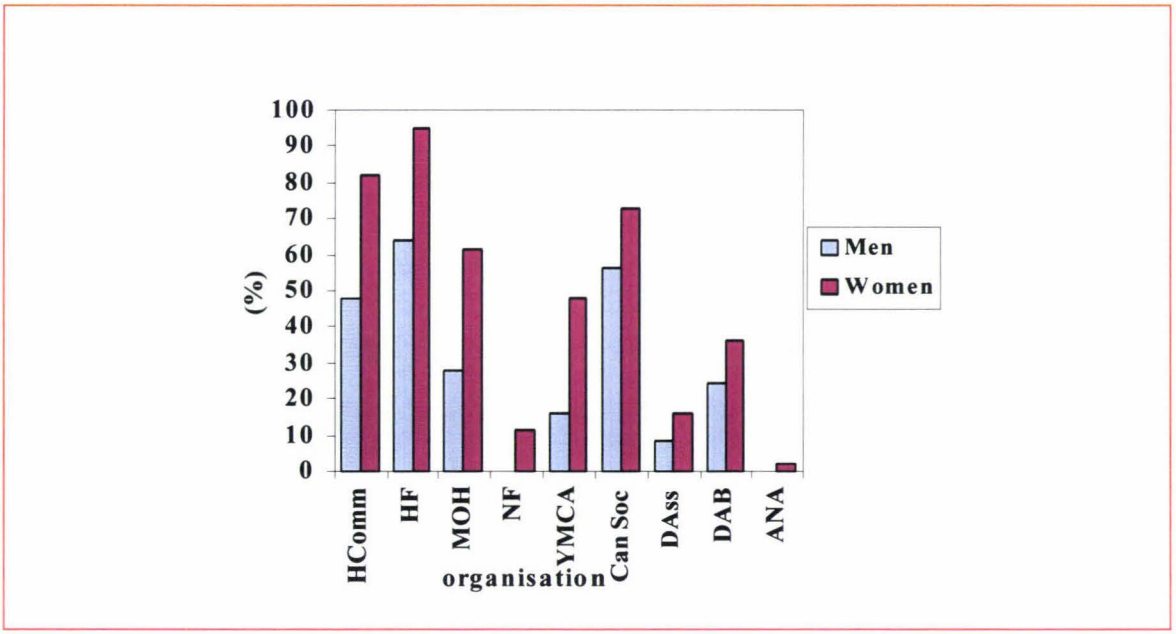


The programmes/messages that the subjects were aware of were Pick the Tick, 5+ a day, Push Play and the Food and Nutrition Guidelines. The Green Prescription, DAB brochures and the Fit Food Challenge had a low awareness of 20% or less. Women scored higher in their awareness of all programmes compared to men.

The organisations that the subjects were aware of having public health messages were The Heart Foundation 84%, Cancer Society 66%, the Hillary Commission 55%, and the Ministry of Health 49%. Approximately one third of the subjects were aware of a message from the YMCA and DAB with only a small percentage aware of a message from the Dietetics Association, Nutrition Foundation and Agencies for Nutrition Action. Women had a higher awareness of the organisations having a message than men. For

example, for the Hillary Commission men scored 48%, women 82%, and the YMCA men scored 16%, women scored 48% (Figure 2).

Figure 2: Aware if organisations have a health message



The subject had very low scores in the section when asked if they knew or had an idea what the various health organisations recommended in regard to exercise with men having no idea what the majority of the organisations' messages were. The Hillary Commission was the most well known message at 17% followed by the DAB 10% and the Heart Foundation 6%. Men scored zero on six out of the nine organisations.

Some typical responses that were written in relation to the different organisations were:

The Hillary Commission:

"Exercise for 20 minutes per day three times per week, promotion of exercise, Fair Play, promote walking. . . "

The Cancer Society:

"Stop smoking, Slip Slop Slap,. . ."

The Ministry of Health:

"Innoculations, administration of national health services, breast screening. . . "

The Heart Foundation:

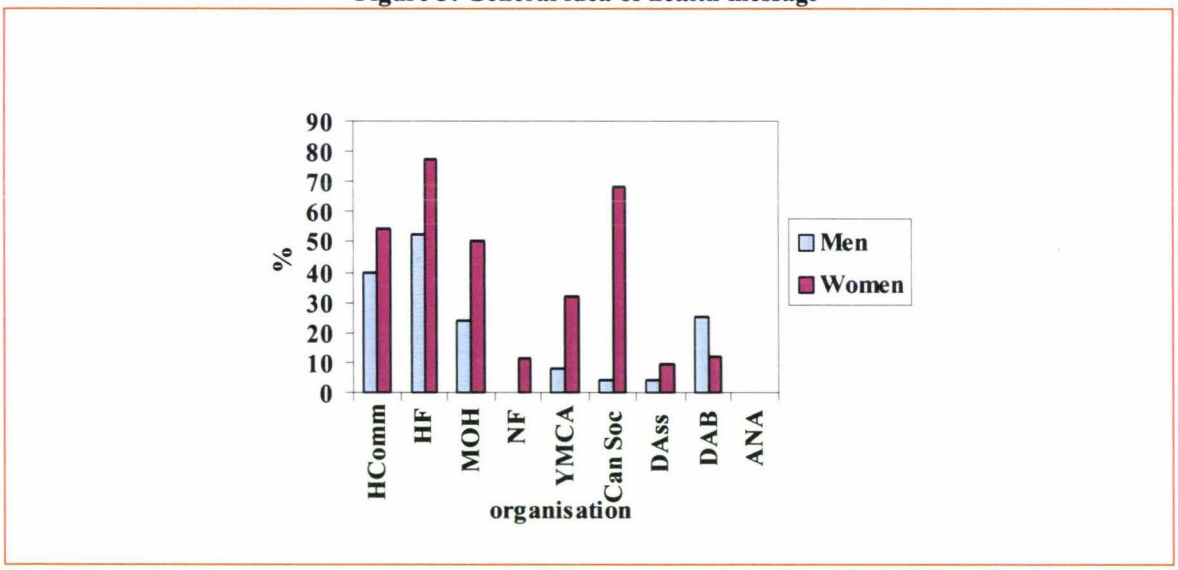
"Pick the tick, drink two glasses of red wine per day, cut down on fat, exercise more."

The Dairy Advisory Bureau:

"Eat dairy products for calcium, milk gives strong bones for kids."

A separate score was calculated if the subjects had a general idea about the health organisation's messages. For example several subjects wrote that the Hillary Commission says to exercise for 20 minutes three times per week and the Cancer Society says we should eat food that is high in fibre and a lot of fruit and vegetables. The organisations that the subjects had a general idea about their messages were the Heart Foundation 68%, Cancer Society 59%, the Hillary Commission 49% and the Ministry of Health 41%. Those with the least idea were The YMCA, Dietetics Association, Nutrition Foundation, Dairy Advisory Bureau and Agencies for Nutrition Action all scoring less than 23%. Again, women scored higher than men (Figure 3).

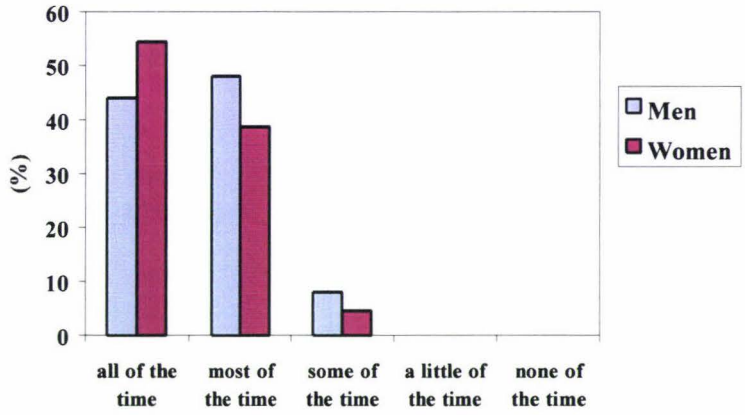
Figure 3: General idea of health message



Data are provided in full in **Table 2 Appendix 4, page 69.**

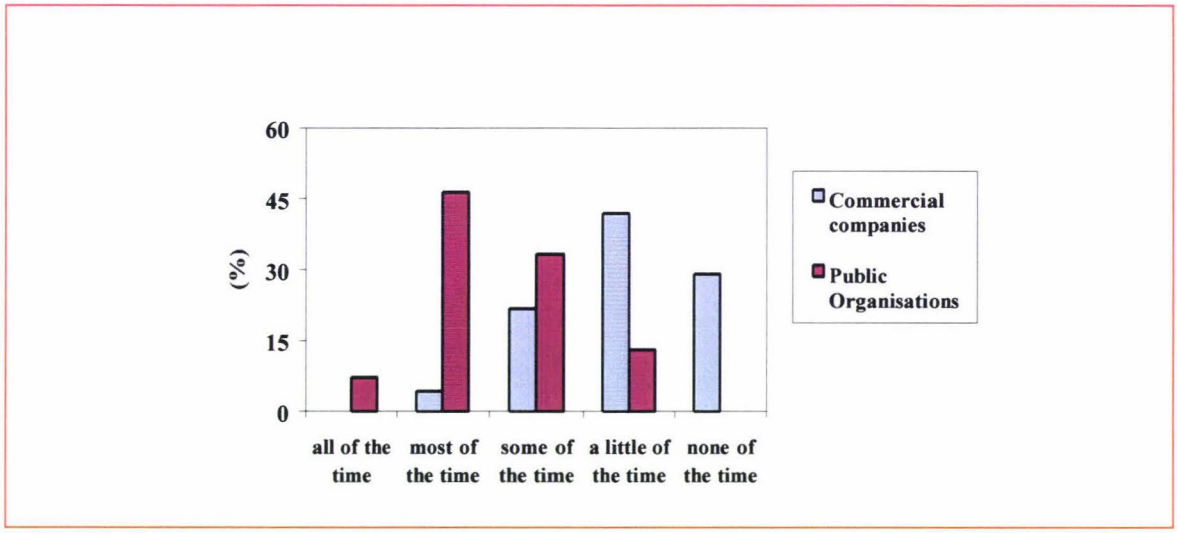
The second part of the questionnaire, questions 4–9, produced more similarities between men and women with similar scores in most questions. The subjects felt that a healthy lifestyle was important to their overall health. A total of 51% stated that it was important all of the time and 42% stated most of the time. More women thought it was important all of the time while more men than women thought it was important most of the time. Hence women were more concerned about achieving a healthy lifestyle as compared to men (Figure 4).

Figure 4: Importance of achieving a healthy lifestyle



Health messages from commercial organisations was adhered to by a third of the subjects either some of the time 36%, or a little of the time 30%. One fifth of the subjects, 20%, took note of health messages most of the time and 13% none of the time. Half of the subjects 55%, thought messages from commercial organisations were plausible some of the time, 25% a little of the time and 16% thought they were plausible most of the time. Just over half of the subjects thought that health messages from commercial companies were more widely available to them than messages from national organisations most of the time 54%, and 19% answered some of the time. Less than 7% thought they were available all, a little or none of the time. A high number of men, 20% did not answer this question. This question produced the most variation in responses from men and women. Men may have been unsure as highlighted in the first section of the questionnaire whereby women overall knew more about national health organisations compared to men. Approximately, just under half the subjects, 42%, acted upon messages from commercial organisations only a little of the time and 29% none of the time. One fifth, 22%, acted upon these messages most of the time and only 4% acted upon them all of the time. The subjects were more likely to act upon health messages from national health promotion organisations with 46% most of the time and 33% some of the time. Only 7% acted upon health messages from national health promotion organisations all of the time and 13% a little of the time (Figure 5).

Figure 5: Subjects who act upon health messages



2.3.2 24-hour dietary recall

Data are provided in full in **Table 3 Appendix 4, page 70.**

Energy

The mean energy intake for men was 10.2 ± 2.8MJ/24hr which was higher than for women 8.8 ± 2.8MJ/24hr ($p < 0.01$) and this reflected for men in all age groups.

Protein

The mean daily protein intake for men was 109 ± 31g which was higher than for women 91 ± 33.1g ($p < 0.01$). The mean percent energy from protein was 19% for men and 18% for women.

Fat

The mean daily fat intake for men was 94 ± 40g which was higher than for women 74 ± 33g ($p < 0.01$). Women aged 50-59 consumed significantly less fat as compared to women aged 40-49 and > 60.

Carbohydrate

The mean daily intake of carbohydrate was 264 ± 76g with men consuming 275 ± 72g and women 258 ± 78g. For both groups, the intake of carbohydrate was highest in the 50-59 age group with the lowest intake in women aged 40–49 years. The mean percent energy contributed from carbohydrate was higher in women than men, 50% compared

to 46% ($p < 0.05$). Women aged 40–49 had significantly less percent energy from carbohydrate as compared to women aged 50-59 and > 60.

Types of fat

Data are provided in full in **Table 4 Appendix 4 page 71.**

Saturated fat was the main contributor to the mean fat intake at 39 ± 18g compared to 26 ± 15g of monounsaturated fat and 10 ± 7g of polyunsaturated fat. Women aged 40–49 consumed significantly less saturated fat as compared to women aged 50–59 and 60+ ($p < 0.001$). For the three types of fat intake for men was higher than women with saturated fat 42 ± 19g for men, 34 ± 17g for women, monounsaturated fat 32 ± 17g for men, 23 ± 12g for women and polyunsaturated fat 11 ± 8g for men and 9 ± 6g for women. This reflected the higher overall fat intake for men ($p < 0.01$). The mean percent energy contributed from fat overall was highest for saturated fat at 15%, followed by monounsaturated fat at 10% and polyunsaturated fat at 4%. Men consumed significantly more saturated and monounsaturated fat compared to women ($p < 0.05$).

Dietary Fibre

The mean daily intake of dietary fibre was 27 ± 10g with men 29 ±10g compared to 26 ± 11g for women. Men aged 50–59 had the highest fibre intake consuming 34g as compared to men aged 60–78 consuming 23g ($p < 0.05$). The intake of dietary fibre for women was similar across all age groups.

Vitamins and Minerals

Data are provided in full in **Table 5 Appendix 4, page 72.**

The mean daily **vitamin C** intake was 135 ± 86mg, 135 ± 87mg for men and 135 ± 86mg for women. Women aged 50–59 consumed significantly more vitamin C as compared to other women ($p < 0.001$). The mean daily intake of **vitamin D** was 3 ± 9ug, with women, 3.7 ± 11ug and men 1.9 ± 2ug. The difference between men and women is due to the significantly higher vitamin D intake of 6.3 ± 18ug in women aged 40–49 years ($p < 0.001$). The mean daily intake of **sodium** was 2.9 ± 1.3g with men consuming more sodium then women at 3.4 ± 1.4g and 2.6 ± 1.2g ($p < 0.01$). The mean daily intake of **potassium** was 4.1 ± 1.2g with men 4.3 ± 1.2g and women 4 ± 1.3g. The mean daily **magnesium** intake was 0.4g ± 0.2 with men consuming 0.4 ± 0.2g and

women 0.4 ± 0.1g. The mean daily intake of **calcium** was 1.2 ± 0.7g with men consuming 1.3 ± 0.6g and women 1.2 ± 0.7g per day. The mean daily intake of **zinc** was 13.5 ± 5.4mg with men consuming significantly more than women 16.1 ± 5.8mg compared to 11.9 ± 4.4mg ($p < 0.001$).

2.3.3 Fitness test

Data are provided in full in **Table 6 Appendix 4, page 73.**

PWC 170(kgm/min)

The mean PWC 170 was 1088.9 ± 427.9 kgm/min with a mean for men of 1448.6 ± 469.3 kgm/min and women 911.7 ± 267.3 kgm/min. The mean PWC 170 decreased with age for men. This trend was not apparent for women.

PWC 170(kgm/min/kg)

The mean PWC (kgm/min/kg) was 14.9 ± 4.7kgm/min/kg with a mean for men at 17.7 ± 4.6kgm/min/kg and women 13.5 ± 4.1kgm/min/kg.

The mean PWC increased slightly for men aged 50–59 then decreased overall for men aged 60–78 while the PWC for women increased with age.

$\dot{V}O_{2max}$(l/min)

The mean $\dot{V}O_{2max}$ was 2.46 ± 0.83 l/min with men 3.08 ± 1.02 and in women it was 2.15 ± 0.48 l/min. $\dot{V}O_{2max}$ decreased with age for men and women.

$\dot{V}O_{2max}$ (ml/kg/min)

The mean $\dot{V}O_{2max}$ was 33.6 ± 8.5 ml/kg/min with men 37.4 ± 9.5 ml/kg/min and women 31.7 ± 7.3 ml/kg/min. $\dot{V}O_{2max}$ ml/kg/min decreased with age for men and women with a larger decline in men than women.

2.3.4 Body composition assessment

Data are provided in full in **Table 7 Appendix 4, page 74.**

Height and weight

Men were taller in all age groups as compared to women ($p < 0.001$), with the overall mean height for men at 1.74 ± 0.08m and women 1.64 ± 0.08m. Men and women aged 40-49 were significantly taller than men and women aged > 60 ($p < 0.05$). Height was

greatest for both men and women in the 40–49 age group. Men were also heavier than women overall ($p < 0.001$), 80.7 ± 14.5kg as compared to women 68.7 ± 12.5kg. Mean weight was greatest in the 40-49 age group for men and the 50–59 age group for women. Men aged 40–49 weighed significantly more than men aged > 60 ($p < 0.05$).

Body Mass Index

Body mass index (BMI) is considered an indicator of overweight with a BMI of 25-30kg/m^2 considered overweight and greater than 30kg/m^2 considered obese. Using this indicator both men and women would be considered overweight with the exception of women aged 40–49. The mean BMI for men was 26.5 ± 3.4kg/m^2 and for women 25.7 ± 4.6 kg/m^2.

Waist hip ratio

The mean waist hip ratio was 0.82 ± 0.08. Men had a significantly higher waist hip ratio 0.89 ± 0.07 as compared to women 0.78 ± 0.05 ($p < 0.001$).

Skin folds

The mean triceps skinfold for men was 19.4 ± 8.8mm, which was significantly less for women 30.2 ± 9mm ($p < 0.001$). Men aged 40–49 had a significantly higher triceps skinfold as compared to men aged 50+ ($p < 0.01$). The mean arm muscle area was 4228 ± 1219cm^2, with men significantly higher measuring 5339 ± 1091cm^2 as compared to women 3565 ± 700cm^2 ($p < 0.001$).

Body Fat

The mean body fat, by total body bioimpedence for was 28 ± 7.3%. Men had a significantly lower amount of body fat 23.6 ± 5.6% compared to women 30.7 ± 6.9% ($p < 0.001$). Women aged 40–49 had significantly less body fat compared to women aged 50-59 and > 60 ($p < 0.001$).

Basal Metabolic Rate

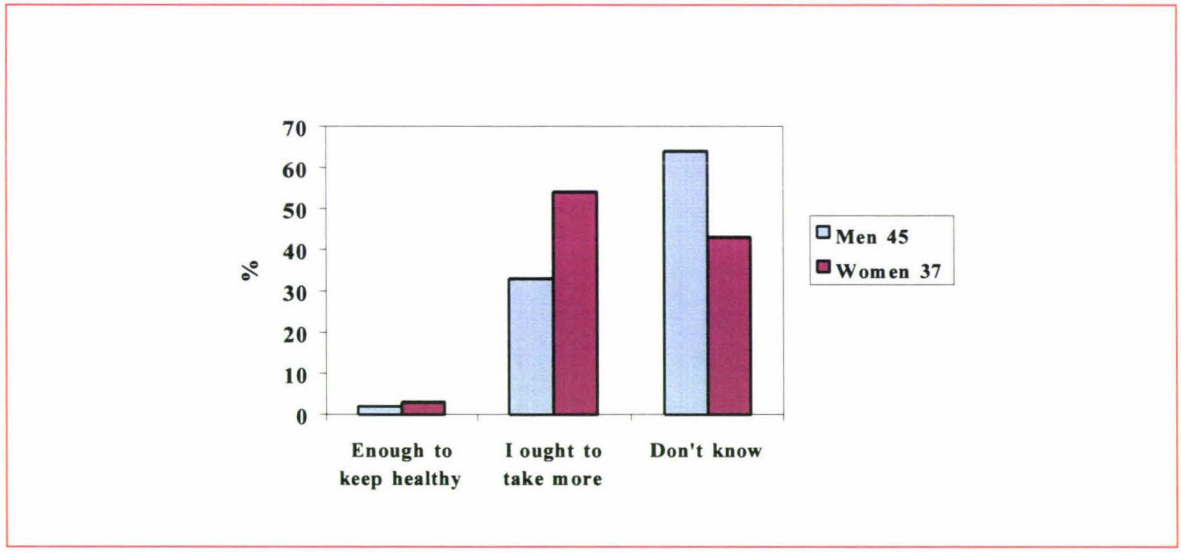
The mean estimated BMR was 6.45 ± 1.08MJ/24hr with a mean for men being significantly higher 7.28 ± 0.98 MJ/24hr compared to women 5.96 ± 0.81 MJ/24h ($p < 0.001$). Men aged 40–49 had a significantly higher BMR than men aged 60+ as did men aged 50–59 compared to men aged > 60 ($p < 0.001$). Women aged 40–59 had a significantly higher BMR compared with women aged > 60 ($p < 0.001$).

2.3.5 Physical activity questionnaire

Data are provided in full in **Tables 8-12 Appendix 4, pages 75-76.**

Subjects walked an average of 32 minutes per day. One third, 33% of men and 63% of women walked more than 30 minutes per day. From the group 21% did not walk daily. The pace of walking varied with 13% walking casually, 27% walking at an average pace, 46% walking fairly briskly and 14% walking at a brisk or striding pace. Most of the subjects thought that they were not doing enough exercise to keep healthy. A total of 33% of men and 54% of women thought they should do more exercise and a very high percentage, 64% men and 43% women did not know whether they were doing enough exercise to keep healthy (Figure 6).

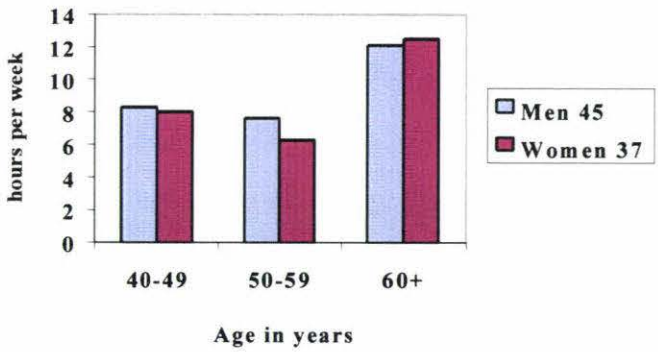
Figure 6: Self view of exercise level



Nearly two thirds, 63 % of subjects said they participated in vigorous exercise (long enough to get out of breath, sweat or get your heart thumping) at least once a week, and 37% did not. A total of 86% of subjects, 85% men and 87% women participated in vigorous exercise five or less times per week and 14% of subjects, 14% men and 13% women participated in vigorous activity more then five times per week. A total of 96% participated in moderate activities, more than 2.5 hours during the week and 4% did not do any moderate activity. Moderate activity was defined as housework, light sports, regular walking, golf, lawn mowing and painting. All age groups participated in more than 6 hours per week of moderate-intensity activity with the 60+ age group

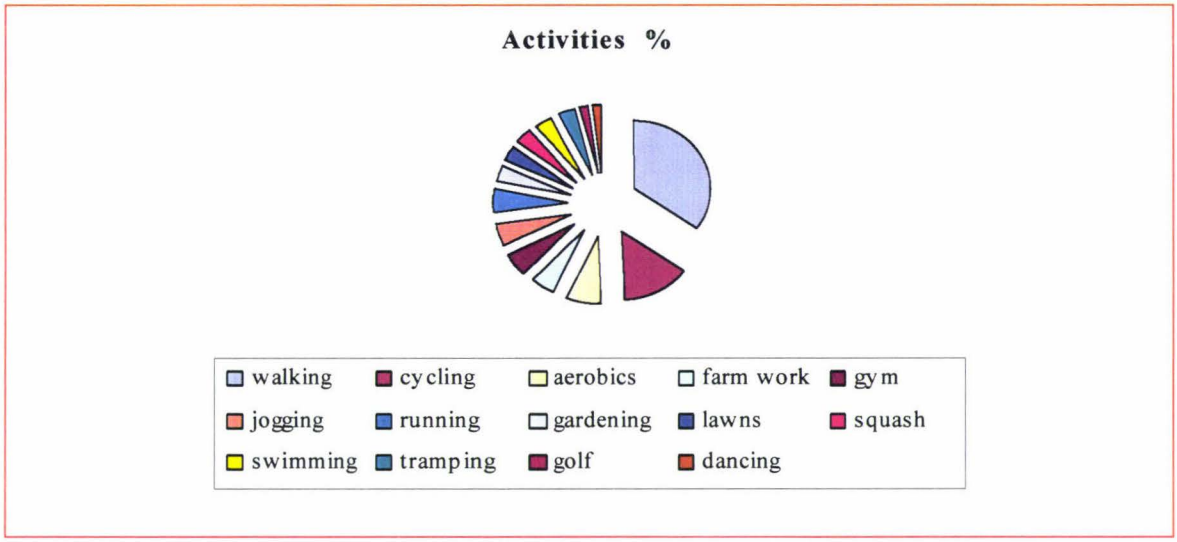
participating in more than 12 hours per week. Men spent more time participating in moderate-intensity activity as compared to women apart from the 60+ age group, however the differences were not large (Figure 7).

Figure 7: Hours per week of moderate intensity activity of men and women



The majority of subjects exerted a moderate to somewhat strong level of exertion when exercising. 44% of men and 43% of women exercised at a moderate level and 29% of men and 19% of women exercised at a somewhat strong level. Both 92% of men and women exercised at an above moderate level. The average time spent on vigorous and moderate exercise varied between the week and weekend. On a usual weekday, subjects spent 1.2 hours per day on vigorous activities, men 1 hour and women 1.3 hours per day, and 4 hours doing moderate activities, men 4.1 and women 3.9 hours per day. During the weekend, men and women spent 1.9 hours doing vigorous activities and 4.3 hours doing moderate activities, 4.5 hours for men and 3.9 hours for women. The most commonly participated in activity was walking 35%, followed by cycling 15% (Figure 8).

Figure 8: Activities commonly participated in



2.3.6 Habitual physical activity questionnaire

Data are provided in full in **Table 13 Appendix 4, page 77.**

A higher score indicates a higher level of activity. The highest index for the group is exercise during leisure time at 2.84 $\pm$ 0.69 and the lowest is for work at 2.53 $\pm$ 0.7. Men had the highest index for sport whereas women had the highest index for work and leisure. For men the work index was highest in the 60–78 year age group, sport was highest in the 40–49 age group and leisure highest in the 50–59 age group. For women the work and sport index was highest in the 60–74 age group while the leisure index was highest in the 40–49 year age group.

2.3.7 SF-36 Health Status questionnaire

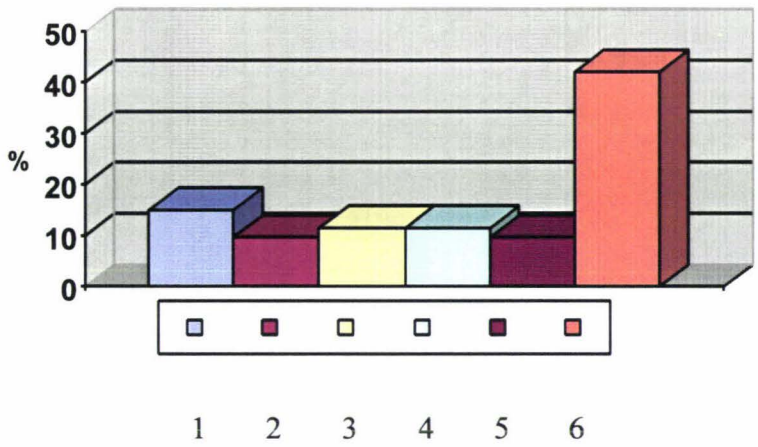
Data are provided in full in **Table 14 Appendix 4, page 77.**

Men scored higher than women apart from role emotional, mental health and a very slight difference in bodily pain. Overall, the men's scores decreased with age apart from social functioning and role emotional. The women's scores increased with age apart from social functioning and mental health. It has to be noted however that there were only two women aged over 60 as compared to nine men aged over 60 so their scores cannot be used with any accuracy.

2.3.8 Socio-economic status

The socio-economic status of the group was assessed on the index developed by Davis et al (Statistics NZ, 1997). The index provides a standardised and internationally comparable measure of occupational class. The increasing scale of one to six reflects a decreasing measure of socio-economic status. (Figure 9)

Figure 9: Socio-economic status of subjects



2.3.9 Health of subjects who responded to the Health Promotion Awareness Questionnaire

The results of the present study were also compared to the 1997 National Nutrition Survey for the similar age group of 45–64 years. A total of 69 subjects responded to the HPAS questionnaire but only 63 were analysed for this comparison, as the other six were not included in the dietary recall and body composition analysis. Tables 6 and 7 show the comparison.

Table 6: Comparison of daily nutrient intake for subjects who responded to the Health Promotion Awareness Questionnaire with the Health Promotion Awareness Study and the National Nutrition survey

Nutrient	Health Promotion Awareness Study		Respondents to the Health Promotion Awareness Study Questionnaire		1997 National Nutrition Survey, NZ European and others	
	Men	Women	Men	Women	Men	Women
Number	41	63	25	38	572	647
Age (years)	55 ± 2 (42-78)	54 ± 1 (40-74)	55± 2 (42-78)	54 ± 1 (40-74)	45-64	45-64
Carbohydrate (% energy)	45.6 ± 8.0	49.5 ± 9.3	43 ± 7.5	48.5 ± 10.5	43 ± 0.5	47 ± 0.4
Protein (% energy)	18.6 ± 5.2	17.6 ±5.4	18.6 ± 5	18.3 ± 5.6	16 ± 0.3	17 ± 0.2
Fat, total (% energy)	33.5 ± 7.8	30.9 ± 9.2	34.8 ± 7.8	31.4 ± 9.6	35 ± 0.5	35 ± 0.4

Table 7: Comparison of physical characteristics of subjects who responded to the Health Promotion Awareness Questionnaire with the Health Promotion Awareness Study and the National Nutrition survey

Characteristic	Health Promotion Awareness Study		Respondents to the Health Promotion Awareness Study Questionnaire		1997 National Nutrition Survey, NZ European and others	
	Men	Women	Men	Women	Men	Women
Number	41	63	25	38	572	647
Age (years)	55 ± 2 (42-78)	54 ± 1 (40-74)	55± 2 (42-78)	54 ± 1 (40-74)	45-64	45-64
Body Mass Index	26.5± 3.9	25.7 ± 4.6	25.2 ± 3.2	25.8 ± 4.4	27.6 ± 0.23	27.9 ± 0.27
Obese (%)	5	9	3	8	23	27
Waist/Hip ratio	0.89± 0.01	0.77±0.01	0.89 ± 0.06	0.77 ± 0.04	0.94	0.80
W/H ratio excess(%)	49	24	21	16	74	48

The results show that the highest percentage of carbohydrate and the lowest percentage of fat were subjects from the HPAS. T-tests showed there were no significant differences between the subjects who responded to the HPAS questionnaire as compared to the original study. The highest percentage of fat intake was from the National Nutrition survey. Table 7 shows that men in the HPAS questionnaire had the lowest BMI, and both men and women had the lowest percentage of obesity and waist-hip ratio excess. The percentage of obesity was also lower as compared to the National Nutrition Survey. Overall there were no significant differences between those who replied to the HPAS questionnaire compared to those who did not but it does highlight that the respondents were overall healthy.

Chapter 3

Discussion

3.1 Awareness of health promotion messages

The subjects were aware of the national health organisations that existed but they had a low awareness of their health messages. There were several comments in the questionnaire from subjects stating that they felt that they did not need to adhere to messages from any organisation, as they already knew what they should be doing to achieve a healthy lifestyle. However, it is unknown where they got this knowledge from, as this was not one of the aims of the HPAS questionnaire. It was interesting to note that the subjects did not think that messages from public health organisations were widely available to the public. This could be interpreted to mean that as the group is generally healthy and they are not in places where these messages are likely to be seen, such as hospitals, doctors' surgeries or involved with programmes and promotions that these health organisations have. In addition, it may reflect that commercial companies promote their messages through a variety of media such as supermarkets, television, newspapers and magazines and hence their messages have a greater impact on the public. The high awareness of programmes such as 5+ a Day, (81% for women and 32% for men) could be due to the supermarket and television promotions that Veg Fed has. Healthy eating was also advertised during television commercial breaks in the recent Sydney Olympics where there was an exceptionally high viewing audience, hence commercial companies may tend to make use of media such as television and therefore they can advertise to a very large audience. Women were overall more aware of all aspects of national health organisations as compared to men. Women are known to be more aware of health and health issues and to be concerned about their own health and therefore they are more likely to act upon these messages. The subjects stated that a healthy lifestyle was important to them and they obviously are discerning about where they get their messages from and what they believe. The subjects were more likely to act upon messages from national health organisations as compared to commercial companies. The paradox is that they do not seem to know much about what the messages from public health organisations are but seem to believe they are more

plausible. It is difficult to know from the few commercial companies given as examples in the questionnaire what their true perception of commercial nutrition and fitness companies are as the list would be endless and there is a great variation in the credibility of commercial companies' health messages. Generally, the commercial companies that were listed as examples are large organisations, which as reported have credible health messages and even after this prompting of examples from the questionnaire the subjects were not convinced of their credibility.

3.2 Comparison of results with norms and averages from other studies.

To gain some insight into the general health of the health promotion awareness subjects an outline of guidelines and results from similar studies is presented.

3.2.1 24-hour dietary recall

The following table provides a summary of the NZ Nutrition guidelines and the Australian Recommended Dietary Intakes (National Health and Medical Research Council, 1992) as a comparison to the results of the HPAS.

Table 8: Nutrient comparisons of this present study with National Guidelines from New Zealand and Australia

Nutrient	HPAS		NZ Nutrition Taskforce Report 1991		RDI for Australia 1991	
	Men	Women	Men	Women	Men	Women
Protein	109g ± 31	91g ± 33	0.8-1.6g/kg body weight[1]		55g	45
Carbohydrate %	46 ± 8	50 ± 9	50-55			
Fat %	33.5 ± 8	30.9 ± 9	30-33			
Saturated %	15.2 ± 4	14.1 ± 4	8-12			
Polyunsaturated %	3.8 ± 2	3.9 ± 2	6-10			
Monounsaturated %	11.6 ± 3	11.1 ± 2	10-20			
Fibre (g)	29 ± 10	26 ± 11	25-30			
Vitamin C (mg)	135 ± 87	135 ± 86	40			30
Vitamin D (ug)	1.9 ± 2	3.7 ± 11				
Sodium (mg)	3392 ± 1416	2640 ± 1179	2760	920-2300		
Potassium (mg)	4373 ± 1154	3995 ± 1263		1950-5460		
Zinc (mg)	16.1 ± 5.8	11.9 ± 4.4	9	12		12
Calcium(mg)	1291 ± 649	1223 ± 664	+600	800		800 +54yrs=1000
Magnesium (mg)	401 ± 188	365 ± 128		320		270

1: The mean weights for the HPAS were men 80kg, women 70kg hence: an 80kg man consuming 1.2g/kg protein = 96g, a 70kg woman = 84g

Overall the Manawatu subjects consumed almost twice the amount of Australian recommended protein in grams per day. However, the Australian recommendations are quite low as compared to the New Zealand recommendations when calculated for an average 80kg man and a 70kg woman. For the HPAS men and women are on average consuming 1.35g of protein/kg body weight, which is an appropriate level for New Zealand guidelines. Overall the subjects were below the recommended percentage of energy from carbohydrate with 40% of women consuming more than 50% of energy from carbohydrate. Fat consumption was met for the percentage of energy from fat for men and women with men being slightly higher at 33.5% but this was not significant. Saturated fat was above the recommended guideline and polyunsaturated fat was below the recommended guideline while monounsaturated fat was within the guideline. Subjects met the dietary fibre target with males over 60 and women 40–49 slightly below this target. Alcohol consumption was below the recommended levels. Vitamin C intake was well above the recommended targets. No recommendation for vitamin D intake exists for Australia or New Zealand as vitamin D can be synthesised by the body with the help of sunlight. Hence, vitamin D is not an essential nutrient, as given enough time in the sun people need consume no vitamin D at all. Sodium and potassium were above the recommended intakes. Zinc and calcium targets were met although the USDA 1997 recommendations for calcium are now higher than this. Lastly, magnesium levels were exceeded by the subjects.

3.2.2 Fitness tests

Table 9: A comparison of results from the fitness tests is made with norms from the University of Western Australia (UWA, 2000) and Nieman (1993)

		PWC 170 (kgm/min.kg) HPAS	PWC 170 (kgm/min/kg) UWA	VO_{2max} (ml/kg/min) HPAS	VO_{2max} (ml/kg/min) norms, Nieman
Men	40-49	18.2 ± 4.7	13.7-18.9+	40.5± 9.2	36-53
	50-59	18.3± 3.9	13.1-18.2+	39.3± 8.1	32-48
	60+	16.4± 5.4	12.7-17.5+	30.7± 8.9	27-44
Women	40-49	12.9± 3.9	9.9-14+	33.2± 8.2	32-50
	50-59	13.6± 2.8	9.6-13.2+	31.5± 5.1	For ages 50-65 29-45
	60+	14.1± 5.8	9.5-12.6+	30± 9.1	

The Australian norms, obtained from personal communication with the University of Western Australia (UWA, 2000) are presented from the range of middle to high for PWC 170 and average to high for VO_{2max}. Subjects from the HPAS are meeting the norms for PWC 170 and are overall in the high range. Women over 60 years of age are above the norms. This shows that subjects from the HPAS have a PWC 170 that is comparable with norms from a similar country with subjects of the same age groups. Subjects from the HPAS all fell within the norms for $VO_{2\ max}$ but tended to be closer to the average end of the scale. As one ages VO_{2max} tends to fall about 9% with each decade after the age of 25 years. Women generally have a lower $VO_{2\ max}$ as they have a higher body fat content, a smaller muscle mass and less haemoglobin to carry oxygen in the blood (Nieman, 1993).

3.2.3 SF-36 Health Status

Table 10: Comparison of HPAS SF-36 Health Status with 1996/7 NZ Health Survey (NZHS)

	Average scores by gender							
Health Concept	Physical Functioning	Role Physical	Bodily Pain	General Health	Vitality	Social Functioning	Role Emotional	Mental Health
Men: HPAS	93.7 ± 14.7	95.3 ± 15.4	84.6± 15.1	77.4± 17.6	74.0 ± 12.3	96.5 ± 9.8	92.5 ± 17.7	82.3 ± 12.2
Men: NZHS	87.1±21.6	81.8 ± 34.5	78.7± 23.9	73.7± 20.3	67.9± 17.7	88.2± 19.7	87.3± 28.9	79.9 ± 14.3
Women: HPAS	86.3± 20.7	92.2 ± 19	83.3± 17.3	81.3± 12.7	66.7± 16	94.8 ± 11.9	94.0± 13	88.3 ± 24
Women: NZHS	85± 21.6	79.6 ± 35.3	77.1± 24.9	74 ± 19.8	63.4 ± 8.9	85.1± 21.4	82.7± 32.5	76.2 ± 15.9

The SF-36 scores are compared to the 1996/7 NZ Health Survey: Taking the Pulse (Ministry of Health, 1999). This survey sampled 7,862 adult New Zealanders over the age of 15 years. This was the first time that the SF-36 was used in a national sample in New Zealand and it has provided a norm that will enable the New Zealand population to be monitored and compared over time. It will also provide a benchmark for other studies to compare results. The results from the NZ Health Survey found that the NZ population had higher mean scores on all scales in comparison with overseas population norms such as Australia and America. Men scored slightly higher than women on most of the scales and scores decreased with age on all scales except for mental health. When compared to the HPAS the subjects scored higher in all categories, men and women included. There were strong similarities in the eight health concepts from those

that had the highest scores to those that had the lowest scores. Social functioning had the highest scores and vitality the lowest for men and women in both studies.

3.2.4 Habitual Physical Activity

There are various methods for measuring physical activity, either directly by questionnaire, diary or mechanical/electronic monitoring or indirectly, by dietary assessment, body composition assessment and sport and recreational participation. With all of these methods information may be collected for a short period of time and an indication of the long-term pattern of habitual physical activity is not assessed. The two questionnaires were chosen as they have been tested to be valid and reliable and give a measurement that can be compared with results from other studies. The Paffenbarger questionnaire provides a standardised system of coding where each physical activity can be coded by function, specific type and intensity based on their rate of energy expenditure expressed as MET's. One MET (metabolic equivalent), is the energy expenditure required in relation to multiples of resting energy expenditure. For this study the subjects resting metabolic rate was calculated and a value could be calculated for the amount of time spent on various activities based on the MET value assigned to it from the Paffenbarger classification of energy costs of human physical activity (Ainsworth, 1993). The Baecke questionnaire makes it possible to distinguish between habitual physical activity at work, sport and leisure time. Both questionnaires ask about physical activity over the past year. Below is a study by Jos Baecke (1982) that enables the scores to be compared to the HPAS. The 167 subjects used for his questionnaire were aged between 20 to 32 years of age so there is some difference in the age gap between this questionnaire and the HPAS subjects. However, the scores were very similar for both men and women in both studies that could show that the HPAS subjects are within the norm for their age. Hence the similarity of the scores shows that the HPAS subjects were able to distinguish between habitual physical activity in the three different categories.

Table 11: Comparison of mean scores of the indices of physical activity using the Baecke study

	Men		Women	
Index	HPAS	Baecke	HPAS	Baecke
Work	2.7 ± 0.6	2.6 ± 0.1	2.7 ± 0.5	2.9 ± 0.0
Sport	2.5 ± 0.7	2.8 ± 0.1	2.4 ± 0.7	2.4 ± 0.1
Leisure	2.8 ± 0.7	2.8 ± 0.1	3.0 ± 0.7	3.1 ± 0.0

3.3 Comparison of the Health Promotion Awareness Study with other studies in New Zealand

The present study involved people over the age of forty years living in the Manawatu. However, large-scale studies used to define national norms include people over a much wider age range and geographical area. An overview of nutrition and physical activity studies in New Zealand is presented below which gives some standards as a way of further analysing the HPAS.

3.3.1 New Zealand nutrition studies

The diet of Auckland men and women aged 25–64 was researched (Scragg et al, 1991) based on a sample of 537 men and 372 women. The group was randomly selected from the Auckland general electoral roll. This study was part of the *Auckland Heart Study.* A food frequency questionnaire containing 118 items was used for participants to recall their intake over the past three months. The results found that men consumed significantly more fat and cholesterol than women and men had a greater tendency to eat fried meat and drink full cream milk. Women consumed more carbohydrate and fibre than men due to their higher intake of fruit and vegetables as well as more calcium. The authors concluded that women were eating a diet that is more in agreement with the national dietary guidelines than men were and may explain the increase in coronary heart disease rates in men as compared to women.

Another Auckland study (part of the *Auckland Heart Study*), measured the dietary intake of 113 men and women aged 50–66 years by a prospective seven-day dietary diary (Arroll et al, 1991). The results were compared to two previous studies, the 1977 National diet survey and the 1985 Timaru Health District study. Compared to these previous surveys there was a decrease in both total fat intake and the percentage of energy from fat. Saturated fat and the absolute amount and proportion of cholesterol decreased and unsaturated fats increased. Protein intake remained the same while carbohydrate intake increased. Total energy intake had not changed. The authors showed that although there were improvements in the diet as compared to previous studies, the dietary guideline of less than 35% energy intake of fat was met by only 64%

of men and 57% of women. The author cites international guidelines of less than 30% of dietary fat should come from fat and less than 10% from saturated fat. Fewer people met these guidelines with 30% of men and 28% of women meeting the guidelines of total fat and 4% and 10% of men and women meeting the saturated fat guidelines. Hence there was still improvement to be made in the nutritional intake of New Zealanders in the prevention of coronary heart disease.

In October 1985, a health survey was conducted in the *Timaru Health District* (Paulin et al, 1988). A seven-day dietary history was obtained from 99 male and 82 female participants aged 50–54 years. A result that stood out in the survey was the low energy intake for women, which was 60% of the intake for men. More women than men claimed to have reduced their energy intake in the last year. The authors suggested a reason for this is that it is fashionable for women to eat less and this may have led to a tendency to under-report the amount of food eaten. Many participants, in particular women, reported to have reduced their intake of fat, salt, eggs, meat and milk and increased their consumption of fish and vegetables. The authors suggested that this was in line with the current dietary recommendations.

The previous studies are compared in the table below with the results of the 1999 HPAS and the 1997 National Nutrition Study (NNS) discussed in section 1.5.1.

Table 12: Nutrition studies in New Zealand compared to the Health Promotion Awareness Study

	Health Promotion Awareness Study 1999	National Nutrition Survey 1997	Auckland Heart Study 1991	Auckland Heart Study 1988	National Diet Survey 1977	Timaru Health District 1985
Number	105	4636	909	113	477	198
Age	40-78	15+	25-64	50-66	50-64	50-54
Energy MJ/d	9.4	9.2	8.4	8.8	9.5	8.4
Carbohydrate g/d	264	259.5	212.8	241	232	220
Protein g/d	98	88	67.5	82.5	79.5	75.5
Fat g/d	82	91	91	77.5	105.5	85.5
Polyunsaturated fat g/d	10	12	15	12	10	8
Saturated fat g/d	37	38	40	33	48.5	39.5
% energy from CHO	48	46	41	43	40	42.5
% energy from protein	18	15.6	14	15	14	15.5
% energy from fat	32	35	42	33	43	38.5
% energy from PUF	3.9	5	7	5.5	4	4.5
% energy from SF	14.6	15	17.7	15.5	19	18
% energy from alcohol	3.1	4	4.2	9.5	3.5	3.5

CHO – carbohydrate, PUF – polyunsaturated fat, SF – saturated fat.

Although there are many differences in the studies in their methodology and design, it is possible to get an impression of the HPAS in relation to other nutrition studies in New Zealand. The HPAS had the least amount of participants with the closest study being the 1988 Auckland Heart Study with 113 participants. The total energy consumed is slightly less than the 1997 NNS with the least amount in the Timaru health district study. It is interesting to note that under-reporting was thought to be prevalent in women in the Timaru study. The HPAS had the highest amount of carbohydrate and protein consumed in grams per day and this was the same for the percent energy from carbohydrate and protein. The HPAS subjects consumed the second lowest amount of fat in grams per day and this translated to the lowest percent energy intake from fat of 32%. The percent energy from polyunsaturated fat was similar to the other studies with saturated fat being the least at 14.6%. Overall, carbohydrate consumption has increased and the percent energy from fat and saturated fat has decreased. Hence, there are some positive findings in the HPAS as compared to the other studies. Of particular note are the results of the National Nutrition Survey for ages 15 and over that the HPAS subjects

were consuming less fat overall and a similar percentage of saturated fat. As the HPAS subjects are all aged over 40 years this is a positive result. The subjects were not intended to be representative of New Zealanders and this is reflected in the data that shows them to be a reasonably healthy group.

3.3.2 New Zealand physical activity studies

The *Auckland Heart and Health Study* looked at the cardiovascular disease risk factors in men and women aged 65–84 years (Bullen et al, 1998). Participants were from Auckland and were invited to either attend study centres or they were interviewed at their homes. The data were collected between 1992–93, by a trained interviewer, and a total of 996 individuals participated in this study. The two ten year age groups were almost equally represented. The Maori and Pacific Island people were not included in the study. Height and weight were measured and when this was not possible, due to frail and kyphotic older people height and weight were estimated. Self-reported leisure time physical activity was categorised as either moderate, (20 minutes or more of activity at least three times per week) or vigorous (the same duration and frequency as moderate activity but of an intensity to cause sweating or hard breathing). Half of the group engaged in regular, moderate leisure time physical activity, 50%, and more men than women participated in physical activity, 55.6% as compared to 43.8%. Vigorous physical activity was uncommon amongst men and women, 3.7%, and less common amongst the older age group. Body mass index for men and women was almost identical, with a small decline with increasing age. Approximately 35% were overweight and 10% obese. More men than women were overweight and more women than men were obese. There was no significant difference between those who were measured and those who self-classified their height and weight.

In 1994, the Ministry of Health published a report titled, "*Shaping up: A profile of New Zealanders' patterns of smoking, drinking, exercise and body mass index.*" The report was based on the results of the 1992–93 NZ Health Survey. The report described the relationship between these four variables and demographic, socio-economic, health status and other health risk indicators. The 1992–93 Health Survey was the first national health survey to be conducted in the country and over a 12 month period 7,065

individuals over the age of 15 living in private households were interviewed. The participants were interviewed over the telephone and those without a telephone or who did not want to be interviewed this way, were interviewed at their home. For the exercise section of the survey participants were asked how many hours they had spent on vigorous exercise in the past week whether at home, work or recreation time. Vigorous was defined as anything that makes you sweat or breathe hard. The hours were categorised into none, less than 2 hours, 2–4 hours and more than 4 hours. Body mass index was calculated by asking people to estimate roughly how tall they were and how much they weighed. By not using an accurate measurement of height and weight, lead the authors to conclude that weight was probably underestimated and height over estimated from their true value. The effect is to underestimate the proportion of the population who are overweight and overestimate the proportion in the underweight BMI category. Some of the key findings were:

- 47% of men and 41% of women engaged in some form of vigorous physical activity in any given week.
- 26% of males and 15% of women devote more than four hours a week to vigorous exercise.
- Older men and women are less likely to exercise vigorously and for shorter periods of time.
- 58% of New Zealanders have a BMI within the normal range. 11% are underweight and 28% are overweight or obese.
- Men and women between the age of 45 and 64 years are the most likely to be obese.
- Women rather than men are more likely to be underweight, whereas men rather than women are more likely to be overweight.

A study of the prevalence of physical inactivity was undertaken for adults over the age of 60 years (Galgali, 1998). The study population was from the *Auckland Hip Fracture Study* undertaken between 1991–94 and comprised of 910 individuals of whom 724 were women. The majority of participants, 82.2%, lived in private dwellings. Approximately half the participants did not participate in any leisure time physical activity (bowls, walking, exercise class) and 15.6% did not undertake any physical

activity. More men than women participated in physical activity and younger people undertook more than older people did.

A comparative study was published on the trends in coronary heart disease risk factors in Auckland between 1982–94 (Simmons et al, 1996). Three studies were compared. *The Auckland Risk Factor Study, 1982, the Auckland Heart Study 1986–88 and the Auckland Heart and Health Study, 1992–3.* The study population chosen was men and women aged 35–64 years. The aim of the study was to look at recent trends in body mass index and to determine whether these trends were associated with changes in cigarette smoking and physical activity. Data collection and survey design were the same as reported in the 1992–3 Auckland Health and Health Study. Body mass increased from 25.6 to 26.4 in men and 24.6 to 25.1 in women between 1982 and 1993–4. The prevalence of overweight and obesity increased from 52.5 to 64.2% in men and 36.5 to 44.9% in women. There was an increase in leisure time physical activity for both men and women while work physical activity decreased. The increase in physical activity over this period should have caused a decrease in BMI of approximately 4% in men and 14% in women. The authors concluded the decrease in smoking could account for only a small percentage of the increase in body mass and the increase is due to an increased energy intake, particularly dietary fat.

The *1990 Life in New Zealand Survey,* (Hillary Commission for Recreation and Sport, 1990) provided a national survey on lifestyles with particular reference to physical activity levels, nutritional status and leisure patterns of New Zealanders. The survey provided a large amount of information about the major health related lifestyle factors of New Zealanders. A total of 11,305 subjects were surveyed between the ages of 15 to over 65 years of age. Activity levels were divided into high, moderate and low. High activity levels were defined as vigorous activity on one or more occasions per week for a total of one or more hours. Moderate activity was defined as subjects who reported at least 21 hours per week of moderate/mild activity. Low activity was subjects who did not fit into either high or moderate activity. Some of the key findings were:

- A greater proportion of men, than women were in the high and low activity groups.
- About half the population did some vigorous activity.

- Women reported far more moderate/mild activity than men – the difference was due almost entirely to housework.
- Men were taller and heavier than women.
- Older age groups were shorter than younger age groups.
- 10% of men and 13% of women were considered obese.
- 43% of men and 27% of women were considered overweight.

The studies described in this section are compared in the table below with the results of the 1999 HPAS and the 1996/7 New Zealand Health Survey discussed in section 1.5.2.

Table 13: Physical activity studies in New Zealand

	1999 Health Promotion Awarenes Study	1996/7 NZ Health Survey, NHS 1997 National Nutrition Survey, NNS	1992-3 NZ Health Survey	1992-3 Auckland Heart and Health Study	1992-3 Auckland Heart and Health Study	1990 Life in NZ Survey	1986-88 Auckland Heart Study
Number	115	NHS=7862 NNS=4636	7065	996	1397	11305	898
Age	40-78	15-75+	15-65	65-84	35-64	15-65	35-64
Mean BMI	26	26.1		24.9	25.2	25	24.7
Overweight %	51	35	19	31.6	41.1	35	
Obese %	7	17	9	21	13.5	11.5	
Exercise %							
None		15.3	56				
MLA	95.7	61		49.7	27.6	99	17
VLA	63.4	46.8	44	3.8	15.7	47	12

MLA – moderate leisure activity, VLA – vigorous leisure activity

The HPAS compares favourably with results from the other studies. The mean BMI is at the higher as compared to other mean BMI's but the age of the subjects has to be taken into account. There were a high percentage of the subjects who were overweight but the mean BMI for men was 26.5kg/m^2 and for women 25.7kg/m^2, hence the subjects were not excessively overweight. A total of 30% had a BMI of > or = 27 and only 7% of the group were obese with a BMI of > 30. However considering some of the latest research referred to on page 13 suggesting a BMI of 22 is healthy, the group is well above that level. Obesity was present in all of the other studies. The subjects experienced a high level of exercise in comparison with the other studies. The HPAS

defined physical activity levels as moderate - more than 2.5 hours per week and vigorous - enough to make you breathe hard or sweat at least once a week. However, there were differences between studies of interpreting moderate and vigorous levels so it is difficult to interpret with any confidence that they did indeed exercise more.

3.3.3 Socio-economic Status

The socio-economic status of the subjects shows that they are not evenly distributed over the range of scales from one to six and the percentage of subjects who are measured as a six, 42%, is reflective of the high number of subjects who are housewives, farmers, or retired. Hence, this may not give an accurate measurement of their true socio-economic status, as the index is not able to give a true reflection of socio-economic status of people in these categories.

Chapter 4

Summary, Conclusion and Future Research

4.1 Health Promotion in New Zealand

The Ottawa Charter states that:

> "Health promotion works through concrete and effective community action in setting priorities, making decisions, planning strategies and implementing them to achieve better health. At the heart of this process is the empowerment of communities, and ownership and control of their own endeavours and destinies" (Ottawa Charter for Health Promotion, 1986).

In New Zealand, as outlined previously, there are several national health organisations who are all working towards common goals of improving the health of the nation. The Ministry of Health reviewed the health status of New Zealanders at the end of the twentieth century and analysed the variations in health between age, gender, ethnic and socio-economic groups (Ministry of Health, 1999). The results from this study found that physical inactivity accounted for about 8% of deaths with obesity responsible for about 4–5%. Diet was not directly measured in the report except for fruit and vegetable consumption, which showed that too little fruit and vegetable consumption in the diet was associated with about 3% of deaths. Of particular interest was that in 1997–1998 almost one third of all the hospitalisations in the 0–74 age group were potentially avoidable, through health promotion or primary health care. In 1996 the leading cause of death in New Zealand was ischaemic heart disease, stroke, chronic obstructive respiratory disease followed by diabetes. Clearly there is a role for national health organisations to reduce the rates of these diseases in New Zealand by making their health messages more known to the public. In 1992, 500 people over the age of 60 were surveyed anonymously on a range of health and lifestyle issues for older people (Richmond, 1996). Doctors were perceived to be the most important sources of health information followed by relatives/friends and books/magazines. High levels of misinformation about lifestyle issues were revealed. The author discussed that lifestyle changes had significant potential to significantly reduce the cost of health and social services. However, doctors who through the study have a potentially important role to

play in health promotion were not comfortable with a health promotion role. Books and magazines have the potential to be more effective than they are but they are also an avenue for commercial organisations to promote information of dubious value. Community organisations and clubs were rated low as a source of health information whereas 59% of these surveyed had attended a club or organisations in the previous month. While the mass media has the potential to reach a broad proportion of the population there has been little research in New Zealand to show the effect of public health promotion strategies.

The Push Play three-year campaign of promoting 30 minutes of moderate physical activity is still in progress and there has not been any large-scale evaluation of the programme to date. In Australia a national physical activity campaign by the National Heart Foundation of Australia took place in 1990 and 1991, which targeted routine forms of physical activity such as walking through television advertisement, public service announcements and distribution of printed material (Owen et al, 1995). Key results from the 1990 campaign found that recall of physical activity increased from 46% precampaign to 71% postcampaign. Walking for exercise increased significantly for men and women who were older than 50 years of age. Significant effects upon walking were also noted in the least educated group. There were no additional changes in physical activity from the 1991 campaign. This suggests that mass media efforts may be effective in promoting behaviour changes in some target groups but the second campaign conducted one year after the first may have been redundant.

There are clearly a number of factors ranging from personal, programme-based to environmental that will influence whether an individual or indeed the population will indeed become more healthy by decreasing the levels of obesity and increasing the level of physical activity. Swinburn et al (1997) estimated the health care costs of obesity in New Zealand at $135m. It was concluded by Richmond (1996) that health promotion needs to be done by people who understand the importance of research based evidence and that research should be the preliminary to health promotion programmes for them to be cost-effective.

The Health Promotion Awareness Study has shown that a group of free-living subjects in the Manawatu demonstrate overall above average health when compared to other similar studies and national norms. The subjects were a non-random sample and were not recruited to be representative of New Zealanders over 40 years of age. The subjects met or exceeded the New Zealand and Australian guidelines for nutrient intake, despite the high level of under-reporting. Hence, they appear to have a balanced healthy diet. The baseline body composition data suggest that compared to the national average there is a lower incidence of overweight and obesity in this group. Indeed the subjects who completed a self-reported assessment of health using the SF–36 scored higher than the national norms for the 1996/7 New Zealand Health Survey. Hence the subjects appear to be in better general health, and this may be associated with better awareness of health issues, than would be typical for their peers.

The group are meeting the Hillary Commission recommendation of 30 minutes or more of moderate level activity on all or most days of the week. Subjects are walking an average of 31.5 minutes per day and 60.3% are walking at a fairly brisk to striding pace. Women walk more than men. The amount of subjects who are exercising at a vigorous level more than five times a week is very low but on average the subjects spend 4.1 hours per week and 6.1 hours in the weekend doing activity at a moderate or vigorous level. The amount of moderate-intensity activity is overall very high when compared to the national recommendation by the Hillary Commission of at least 2.5 hours per week in particular in the 60 and over age group. This could be accounted for the number of subjects who were retired in this age group and generally having more time to participate in these types of activity such as gardening and walking

There were statistically significant differences between men and women in the body composition and 24-hour food recall. Men were taller, weighed more, had a higher W/H ratio and had a larger arm muscle area. Women on the other hand had a higher triceps skinfold measurement and a higher percentage of body fat. Men consumed more energy (MJ), protein, total fat, saturated fat, monounsaturated fat, sodium and zinc. Women only differed in that they consumed a higher percentage of carbohydrate. There were not many significant differences between the men's age groups. Younger men weighed more, had a higher BMR and triceps skinfold measurement. In regard to

women, younger women were taller, had a lower fat percentage and a higher BMR as compared to older women. Middle-aged men, 50–59 consumed more fibre as compared to other men. Middle-aged women, 50–59 years had a higher percentage intake of carbohydrate, vitamin C, and vitamin D. Older women aged 60 and over consumed more fat per day. Hence it could be said that younger women were overall healthier than older women, whereas there was not a great deal of difference between men's age groups nor between men and women.

The HPAS has shown that a group of subjects with above average health were overall not aware of health messages from national health organisations and were wary of health messages from commercial organisations. The issue that this raises is people who achieve health goals are not well versed in either their detail or the organisation that promotes them. A more typical scenario is for people to have the "knowledge" but not act accordingly whereas the HPAS subjects act accordingly but do not "know". The author decided to produce a leaflet with the relevant and current health messages (Appendix 5) as a method of getting health promotions messages to the subjects in the HPAS. This was one way of letting the subjects who are already achieving health goals gain some knowledge.

4.2 Recommendations and Future Research

The HPAS has raised some interesting findings that have the potential to be researched further. This study found that people over the age of forty are healthy but do not receive their health messages from national health organisations and little note is taken of health messages from commercial organisations. Little is known about awareness of health promotion awareness from the general population.

4.2.1 Questions raised by the Health Promotion Awareness Study

To the author's knowledge there is no information available in New Zealand assessing where individuals of different age groups are obtaining their health information from or indeed if they are obtaining any health information at all. Also there is no information available assessing whether men or women or different age groups are adhering to health messages provided by health organisations. This study found a difference in

awareness of health messages between men and women. Obviously there are gaps in who are receiving health messages. Are health organisations already preaching to the converted or are younger age groups adhering to the information? For example the Hillary Commission and Heart Foundation have programmes for school age children and do they have a higher awareness of these messages than older people in the fact that they are exposed more often to these messages? The impact of socio-economic status on the awareness of health promotion messages is a factor that has not been studied. Do income, education and occupation have an influence on the above factors? Other variables such as smokers versus non-smokers, self-assessed health and GP visits would provide valuable information for national health promotion organisations in assessing where to target their messages.

The second issue that the HPAS raised which was not explored in any depth in this study was the difference in messages from national health organisations and commercial organisations. The subjects in this study were wary of messages from commercial organisations and did not always think they were believable or choose to act on their messages. Commercial organisations have the potential to have a great influence by sheer numbers and ability to get in front of the average citizen through avenues such as supermarkets and the media. Hence, there is perhaps some valuable information in this study for commercial organisations to add credibility to their products by researching how to make their messages more credible.

4.2.2 A possible study – "Awareness and knowledge of messages from national health organisations."

The following is an outline for a possible study.

Aims and objectives.

- To assess the awareness and knowledge of messages from national health organisations' in a representative group of adult New Zealanders.
- To gain an understanding whether New Zealanders have a general or specific knowledge of health messages.

- To understand whether messages are known by men or women, different age groups and different ethnic origins.
- To asses the overall health of the group

Experimental Design

- The group would need to be randomly selected aged over 18 years and be representative of adults living throughout New Zealand.
- Baseline data would need to be collected to ascertain the overall health of the group including a 24–hr diet recall, body composition analysis and fitness test. This information could be used to compare the health of the subjects with their knowledge of health promotion messages. If laboratory analysis was needed for this information perhaps only a representative sample of the group could be tested depending on funding. Data on the individual's education, occupation, income, smoking, GP visits would also be collected so analysis could be made on socio-economic status and other such variables.
- A questionnaire would be administered on the subjects' knowledge of health promotion organisations and the messages they have. If an existing questionnaire is not available a new questionnaire would need to be developed In designing the questionnaire the following would need to be adhered to:
    1. careful consideration as to the areas of knowledge to be assessed
    2. the questionnaire would need to be piloted by a representative sample.
    3. the questionnaire would need to be tested for reliability and validity
- Recruitment could be through a doctor's surgery, a community facility such as a public library or a company workforce such as Fletcher Challenge.

Sample size

- The group would need to be varied in ethnic origin including European, Maori, and Pacific.
- The sample size would be selected on the basis of statistical power calculations depending on how the group was surveyed, i.e. mail out survey or one-on-one interview.

Data handling

- Data would need to be analysed for mean, standard deviation, confidence intervals, percentiles. Data would be analysed into age group categories for men and women and this would depend on the numbers in each age group and also
- on the age groups that other studies are categorised into that the study may be compared to. Comparisons between men and women and amongst men and women would be analysed and for this T-Tests and Analysis of Variance could be used.

Ethical issues

- The privacy of the subjects participating in the study would need to be kept, in particular the subjects involved in 24-hr diet recall, body composition and fitness analyses
- Consent from all participants would need to be given with a clear outline to them about the use of the data

From this information the findings could give a clear idea of the level of awareness of messages from health promotion organisations for different age groups, ethnic backgrounds, income levels and occupational status. Hence this would provide valuable information to health organisations as to where to target their messages.

Dear

I am writing to ask you if you would be willing for us to make further use of some of the data we collected from you during our lifestyle study.

We now have information about the food intake, physical fitness and physical characteristics of over 100 people. We are now ready to use this information to assess the lifestyle of a sample of people living in the Manawatu over the age of 40.

We would now like to include Fiona Boyle in our team. Until this year Fiona was working as a Health Promotion Coordinator with the National Heart Foundation. She has a great deal of expertise and interest in public health and is ideally suited to join our team. She is now working full time towards the degree of MPhil, for which I am her superviser. Fiona's MPhil thesis will explore how well health promotion messages are received and acted upon by the general public.

We would like to use the data that we have collected from you and our other volunteers to give us some insights about whether people's lifestyles reflect the health messages that are promoted by organisations such as the Heart Foundation. Although we would use the data we have already collected, we would like to ask you some additional questions about your awareness of health promotion messages. This would involve you filling in the questionnaire, which is enclosed. Completion of the questionnaire is entirely voluntary and you may decline to answer any of the questions.

Massey University Human Ethics Committee has approved extension to our project. However if you do not feel comfortable about Fiona having access to your data, and for her to include the data in her MPhil thesis, would you please let us know by returning the slip below.

We will send you a summary of you findings later in the year.

With kind regards
Yours sincerely

J.Hilary Green
Senior Research Scientist.
pp Fiona Boyle

P.S We would like the questionnaire to be returned by Friday 31st March in the enclosed envelope.

.....
Name.....

I do not want my data to be used in Fiona Boyle's MPhil thesis ☐

Health Promotion Awareness Questionnaire

It is assumed that filling in this questionnaire implies consent. You have the right to decline to answer any particular question

1 Have you heard of any of the following organizations
Please place a circle around your answer

The Hillary Commission
The YMCA
The Ministry of Health
The NZ Nutrition Foundation
Dairy Advisory Bureau
The National Heart Foundation
The Cancer Society
The NZ Dietetics Association
Agencies for Nutrition Action

2 Are you aware of any of the following programs/ messages that these organizations promote to the public in relation to physical activity and nutrition?

Pick the Tick
5+ a day
The Green Prescription
'Thank Goodness for Dairy" brochures
Push Play
Food and Nutrition guidelines
Fit Food Challenge

3 Are you aware of any of the health messages that these organizations are promoting in regard to nutrition and physical activity?
For example what does the Hillary Commission recommend about the amount of exercise we should be doing per day? What does the National Heart Foundation say about what we should be eating each day?
Place a circle around each organization if you are aware of any health messages that these organizations promote and in the space beside it write down their message if you have know or have an idea what it is.

The Hillary Commission.....
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The YMCA.....
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The National Heart Foundation.....
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The Cancer Society.....
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The Ministry of Health.....
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The NZ Dietetics Association.....
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The NZ Nutrition Foundation.....
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The Dairy Advisory Bureau.....
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Agencies for Nutrition Action.....
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Health messages are also promoted from other sources such as **commercial company's** e.g.Kellogs, Watties, Sanitarium, Tararua, Hubbards, Sports drinks(i.e. Gatorade, Red Bull) and gyms. This can be on the products packaging, through the media in television, radio, magazines and newspapers advertisements, or through sponsorship of events.

Please circle one answer for each question

4	Do you feel that trying to achieve a healthy lifestyle is important to your overall health?	All of the time	Most of the time	Some of the time	A little of the time	None of the time
5	Do you take note of the health messages that are promoted by commercial companies	All of the time	Most of the time	Some of the time	A little of the time	None of the time
6	Do you think the health messages commercial companies promote are plausible/believable	All of the time	Most of the time	Some of the time	A little of the time	None of the time
7	Are health messages from commercial companies more widely available to the public than health messages from health promotion agencies	All of the time	Most of the time	Some of the time	A little of the time	None of the time
8	Do you act upon health messages from commercial companies such as Sanitarium	All of the time	Most of the time	Some of the time	A little of the time	None of the time
9	Do you act upon health messages from health promotion agencies such as the Heart Foundation	All of the time	Most of the time	Some of the time	A little of the time	None of the time

Any further comments
.....
.....
.....

Thank you for your time

16 March 2000

Dear

I am now following up my request to use the information about your food intake, physical fitness and physical characteristics to assess the lifestyle of a sample of people over the age of 40 who live in the Manawatu.

We actually find now that we have sufficient information about your living circumstances but would like to ask you some additional information about your awareness of health promotion messages.

This would involve you filling out the questionnaire, which is enclosed. Completion of this questionnaire is entirely voluntary and you may decline to answer any of these questions.

Massey University Human Ethics Committee has approved this extension to our project.

However you may still say no to Fiona having access to your data, and for her to include the data in her MPhil thesis.

Thank you again with our human research

With best wishes
Yours sincerely

J.Hilary Green
Senior Research Scientist

PP Fiona Boyle

P.S We would like the questionnaire to be returned by Friday 31st March in the enclosed envelope.

Table 1 **Health Promotion Awareness Questionnaire** **Appendix 4**

Question	Total no=69 M = 25 W = 44 No's in %	Hillary Commission	YMCA	Ministry of Health	Nutrition Foundation	Dairy Advisory Bureau	The Heart Foundation	Cancer Society	Dietetics Assn	Agencies for Nutrition Action
Heard of the organisation	Total	95.7	91.3	95.7	30.4	55	95.7	95.7	42	4.3
	Men	88	88	88	20	36	88	88	32	0
	Women	100	93.2	100	36.4	66	100	100	47.7	6.8
Aware organisation has a health message	Total	55	36	49	11.4	32	84	66	13	1.4
	Men	48	16	28	0	24	64	56	8	0
	Women	82	47.7	61.4	11.4	36.3	95	72.7	15.9	2.3
Correct health message	Total	17	2.9	1.4	1.4	10.1	5.8	4.3	2.9	2.9
	Men	4	0	0	0	8	4	0	0	0
	Women	23	4.5	2.3	2.3	11.4	6.8	6.8	4.5	4.5
General idea of health message	Total	49	23.2	41	7.2	20.3	68	59	7.2	0
	Men	40	8	24	0	12	52	4	4	0
	Women	54.5	31.8	50	11.4	25	77.3	68.2	9.1	0

Programme /message that is promoted to the public	Pick the Tick	5+ a Day	Green Prescription	DAB Brochures	Push Play	Food and Nutrition Guidelines	Fit Food Challenge
Total %	43	64	20.3	18.8	32	32	16
Men %	20	32	8	12	16	16	8
Women %	56.8	81.8	48	22.7	41	32	36

Table 2 **Health Promotion Awareness Questionnaire** **Appendix 4**

Question	Respondents T=69, M=25, F=44	All of the time	Most of the time	Some of the time	A little of the time	None of the time	Did not answer
Achieving a healthy lifestyle is important to your overall health.	Total	50.7	42	5.8			1.5
	Men	44	48	8			
	Women	54.5	38.6	4.5			2.3
Do you take note of health messages that are promoted by commercial companies?	Total		20.3	36.2	30.4	13	
	Men		12	36	36	16	
	Women		25	36.4	48	11.4	
Do you think that health messages for commercial companies are plausible/believable?	Total		15.9	55	24.6	4.3	
	Men		16	56	28	28	
	Women		15.9	54.5	22.7	22.7	
Are health messages from commercial companies more widely available to the public than health messages from health promotion companies?	Total	4.3	53.6	18.8	7.2	4.3	11.6
	Men	0	60	8	13	12	20
	Women	6.8	50	25	4.7	4.5	6.8
Do you act upon health messages from commercial companies?	Total		4.3	21.7	42	29	
	Men		4	24	48	24	
	Women		4.5	25	31.8	38.6	
Do you act upon health messages from health promotion agencies?	Total	7.2		33	13		
	Men	8		36	12		
	Women	6.8		31.8	13.6		

Values are presented as means and standard deviation

Table 3: 24-hour dietary recall **Appendix 4**

			Energy MJ		Protein g		Protein %		Fat g		Fat %		Carbohydrate g		Carbohydrate %	
			Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD
	Overall	105	9.4	2.6	98	34	18	5	82	37	32	9	264	76	48	9
Men	Total	41	10.2 [b]	2.8	109 [b]	31	19	5	94 [b]	40	34	8	275 [a]	72	46 [a]	8
	40-49	14	10.3	2.7	108	24	18	3	96	34	35	8	272	66	45	8
	50-59	17	10.2	3.1	106	34	19	7	94	46	33	8	291	82	48	8
	60-78	10	10.2	2.8	115	37	19	3	94	43	33	8	254	62	43	7
Women	Total	63	8.8	2.4	91	33	18	5	74	33	31	9	258	78	50	9
	40-49	21	8.2	1.9	94	33	19	4	80 [c]	30	36	7	209 [b]	45	44 [c]	9
	50-59	23	9.7	2.6	78	22	14	5	78 [c]	29	30	8	299	92	52 [c]	7
	60-74	19	8.4	2.5	103	40	20	5	64 [c]	40	27	11	261 [b]	58	53 [c]	9

Key to tables: In total columns a,b,c indicates significant differences between men and women
In age group columns a,b,c indicates significant differences between age groups
a=p < 0.05, b=p < 0.01, c=p < 0.001

Quartiles							
Men	Lowest	4.7	62	11	26	19	104	30
	Median	9.8	106	18	86	33	276	46
	Upper	11.6	124	21	128	39	327	51
	Highest	16.7	208	36	175	46	425	62
Women	Lowest	3.9	27	9	18	17	118	30
	Median	8.3	84	17	78	29	251	52
	Upper	9.9	112	21	85	39	291	56
	Highest	13.6	206	31	170	51	421	67

Table 4: Types of fat **Appendix 4**

			Saturated fat g		Saturated fat %		Mono-unsaturated fat g		Mono-unsaturated fat %		Polyunsaturated fat g		Polyunsaturated fat %		Fibre g	
			Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD
	Overall	105	39	18	15	4	26	15	10	2	10	7	4	2	27	10
Men	Total	41	42 [a]	19	15 [a]	4	32 [b]	17	12 [a]	3	11	8	4	2	29	10
	40-49	14	44	16	16	4	32	14	11	2	9	5	3	1	28	8
	50-59	17	38	18	14	3	33	21	12	3	13	11	5	1	34 [a]	12
	60-78	10	47	24	17	3	31	16	11	2	8	3	3	1	23 [a]	6
Women	Total	63	34	17	14	4	23	12	10	2	9	6	4	2	26	11
	40-49	21	36 [c]	14	16	4	25	11	11	2	10	6	5	2	25	10
	50-59	23	37 [c]	17	14	4	32	10	9	2	9	6	4	1	28	7
	60-74	19	27 [c]	18	12	3	20	16	9	1	9	7	4	2	26	14

Key to tables: In total columns a,b,c indicates significant differences between men and women
In age group columns a,b,c indicates significant differences between age groups

a=$p < 0.05$, b=$p < 0.01$, c=$p < 0.001$

Quartiles								
Men	Lowest	11	26	6	21	3	5	13
	Median	42	45	27	33	8	10	27
	Upper	53	49	46	37	12	12	34
	Highest	85	79	76	46	38	25	53
Women	Lowest	5	25	3	18	2	5	9
	Median	33	46	22	30	7	11	24
	Upper	43	51	28	32	10	14	31
	Highest	74	60	68	43	30	35	54

Table 5: Vitamins and minerals **Appendix 4**

			Vitamin C mg		Vitamin D ug		Sodium g		Potassium g		Magnesium g		Calcium g		Zinc mg	
			Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD
	Overall	105	135	86	3	9	2.9	1.3	4.1	1.2	0.4	0.2	1.2	0.7	13.5	5.4
Men	Total	41	135	87	1.9	2	3.4[b]	1.4	4.3	1.2	0.4	0.2	1.3	0.6	16.1[c]	5.8
	40-49	14	143	88	1.8	2	3.4	1	4.5	1.1	0.4	0.1	1.2	0.4	16.2	5.9
	50-59	17	138	95	2	2	3.8	1.8	4.4	1	0.4	0.3	1.3	0.7	15.2	5.2
	60-78	10	117	75	1.9	1	2.8	1.1	4.2	1.5	0.4	0.1	1.3	0.8	17.3	7
Women	Total	63	135	86	3.7	11	2.6	1.2	4	1.3	0.4	0.1	1.2	0.7	11.9	4.4
	40-49	21	103[c]	59	6.3[c]	18	2.5	0.9	3.6	1.2	0.3	0.1	1.2	0.5	12.1	4
	50-59	23	193[c]	81	1.6[c]	2	2.5	1.3	4.3	1.2	0.4	0.1	1	0.6	10.4	3.3
	60-74	19	116[c]	84	3.1[c]	7	3	1.3	4.1	1.3	0.4	0.2	1.5	0.8	13.8	5.4

Key to tables: In total columns a,b,c indicates significant differences between men and women
In age group columns a,b,c indicates significant differences between age groups
a=$p < 0.05$, b=$p < 0.01$, c=$p < 0.001$

Quartiles								
Men	Lowest	36	0.1	1	2	0	0	6
	Median	116	1.7	3	4	0	1	15
	Upper	170	2.6	4	5	0	2	19
	Highest	463	6.9	7	7	1	3	31
Women	Lowest	1	0.1	1	2	0	0	4
	Median	132	1.2	2	4	0	1	12
	Upper	197	2.1	3	5	0	2	15
	Highest	415	80.9	6	7	1	4	26

Table 6: Fitness test **Appendix 4**

			PWC 170 kg/min		PWC 170/kg kg/min/kg		$\dot{V}O_{2max}$ l/min		$\dot{V}O_{2max}$ ml/kg/min	
			Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD
	Overall	100	1088.9	427.9	14.9	4.7	2.5	0.8	33.6	8.5
Men	Total	32	1448.6	469.3	17.7	4.6	3.1	1	37.4	9.5
	40-49	14	1583.8	507	18.2	4.7	3.5	1	40.5	9.2
	50-59	9	1501	341.5	18.3	3.9	3.2	0.7	39.3	8.1
	60-78	9	1186.1	454.4	16.4	5.4	2.2	0.8	30.7	8.9
Women	Total	68	911.7	267.3	13.5	4.1	2.2	0.5	31.7	7.3
	40-49	22	855.3	217.1	12.9	3.9	2.2	0.4	33.2	8.2
	50-59	27	956.6	210.4	13.6	2.8	2.2	0.4	31.5	5.1
	60-74	19	913.6	392.2	14.1	5.8	1.9	0.6	30	9.1

Quartiles					
Men	Lowest	614.1	11.5	1.1	19.7
	Median	1369.4	17.2	2.9	35.7
	Upper	1874.3	20.9	3.6	43.6
	Highest	2432.4	26.8	5.3	57.7
Women	Lowest	462.2	5.9	1.3	17.2
	Median	880.6	13.1	2.1	30.5
	Upper	1010	15.8	2.4	35.2
	highest	2213.3	33.1	3.9	58.8

Table 7: Body Composition **Appendix 4**

			Height m		Weight kg		BMI kg/m^2		W:H Ratio		Triceps skinfold mm		Arm muscle area cm^2		Fat – bioimpedence %		BMR MJ/24hr	
			Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD
	Overall	115	1.68	0.09	73.1	14.4	26	4.4	0.82	0.08	26.1	10.3	4228	1219	28	7.3	6.45	1.08
Men	Total	43	1.74 [c]	0.08	80.7 [c]	14.5	26.5	3.9	0.89 [c]	0.07	19.4 [c]	8.8	5339 [c]	1091	23.6 [c]	5.6	7.28 [c]	0.98
	40-49	16	1.77 [a]	0.06	87.7 [a]	18.6	28	5.5	0.9	0.07	24.5 [b]	9.4	5401	1272	23.1	6.1	7.86 [c]	0.89
	50-59	17	1.76	0.06	78.6	8.2	25.5	2.5	0.89	0.06	16.9 [b]	8.2	5402	895	22.5	5.8	7.42 [c]	0.39
	60-78	10	1.68 [a]	0.11	72.9 [a]	10.8	25.7	2	0.9	0.08	15.2 [b]	3.8	5133	1169	26.2	3.4	6.11 [c]	0.83
Women	Total	72	1.64	0.08	68.7	12.5	25.7	4.6	0.78	0.05	30.2	9	3565	700	30.7	6.9	5.96	0.81
	40-49	25	1.66 [a]	0.07	67.8	13.4	24.7	4.9	0.76	0.05	29.3	8.6	3478	929	26.3 [c]	7.1	6.21 [c]	0.83
	50-59	28	1.64	0.06	71.9	13.8	26.8	4.9	0.79	0.04	32.5	10.5	3516	479	32 [c]	5.6	6.14 [c]	0.79
	60-74	19	1.6 [a]	0.06	64.9	7.6	25.5	3.4	0.78	0.03	28	6.4	3752	624	34.5 [c]	5.2	5.35 [c]	0.41

Key to tables: In total columns a,b,c indicates significant differences between men and women
In age group columns a,b,c indicates significant differences between age groups

a=$p < 0.05$, b=$p < 0.01$, c=$p < 0.001$

		Quartiles							
Men	Lowest	1.48	53.2	19	0.73	7.1	2891	12.2	4.53
	Median	1.76	80.6	27	0.91	16.1	5367	23.7	7.5
	Upper	1.8	87.5	28	0.94	25.8	6013	27.1	7.81
	Highest	1.88	143.4	44	1.07	40.3	7815	38.2	10.53
Women	Lowest	1.46	49.4	18	0.66	10.4	1697	14.6	4.37
	Median	1.63	65.6	25	0.78	29.2	3548	31.4	5.81
	Upper	1.67	73.5	27	0.81	36	3834	34.9	6.33
	highest	1.79	114.6	41	0.89	55.1	6776	44.2	8.17

Table 8: Physical activity – Paffenbarger **Appendix 4**

Views on Exercise %		Enough to keep healthy	I ought to take more	Don't know
Men	45	2	33	64
Women	37	3	54	43

Table 9: % of exercise per week **Appendix 4**

No. of times subjects exercise per week %		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Men	45	27	16	24	9	9	4	2	0	0	2	0	0	0	2	2	2
Women	37	30	27	19	3	8	5	5	0	0	0	0	0	0	3	0	0

Table 10: Level of exertion **Appendix 4**

Level of Exertion when exercising %		Nothing at all	Very very weak	Very weak	Weak	Moderate		Somewhat strong		Strong		Very strong		Very very strong	
		0	0.5	1	2	3	3.5	4	4.5	5	6	7	8	9	10
Men	45	4	0	0	2	44	4	29	0	2	4	7	0	2	0
Women	37	3	0	0	3	43	3	19	3	16	3	5	3	0	0

Table 11: Daily walking **Appendix 4**

Daily walking time – mins %		0-10	10-20	20-30	30-40	40.-50	50-60	60+
Men	45	33	18	13	7	4	9	16
Women	37	19	8	11	19	11	3	30

Table 12: Daily habitual physical activity **Appendix 4**

Hours of habitual physical activity per day											
	No.	Vigorous activity		Moderate activity		Light activity		Sitting		Sleeping or reclining	
Weekdays		Mean	± SD	Mean	±SD	Mean	± SD	Mean	±SD	Mean	± SD
Total	82	1.2	1.9	4.0	2.7	5.1	3.1	5.7	3.0	7.7	1.8
Men	45	1.0	1.9	4.1	2.7	4.4	3.0	6.4	2.6	7.9	1.9
Women	37	1.3	2.0	3.9	2.5	6.1	3.2	3.4	3.4	7.6	1.5
Weekend											
Total	82	1.5	1.9	4.3	2.5	3.9	2.3	5.3	2.4	8.4	1.5
Men	45	2.0	1.8	4.7	2.7	3.6	2.2	5.6	2.5	8.4	1.3
Women	37	1.8	2.0	3.7	2.1	2.5	2.5	4.9	2.5	8.4	1.6

Table 13: Habitual Physical Activity – Baecke **Appendix 4**

			Work		Sport		Leisure	
			Mean	± SD	Mean	± SD	Mean	± SD
	Overall	108	2.66	0.57	2.53	0.7	2.84	0.69
Men	Total	42	2.53	0.58	2.71	0.7	2.74	0.7
	40-49	15	2.44	0.66	2.97	0.83	2.67	0.75
	50-59	17	2.31	0.37	2.49	0.51	2.84	0.75
	60-78	10	3.05	0.48	2.73	0.68	2.68	0.57
Women	Total	66	2.74	0.54	2.4	0.69	3.04	0.67
	40-49	23	2.71	0.53	2.4	0.59	3.04	0.71
	50-59	24	2.75	0.61	2.38	0.69	2.88	0.73
	60-74	19	2.76	0.5	2.5	0.82	2.8	0.57

Table 14: Health Status — SF-36 **Appendix 4**

			Physical Functioning		Role Physical		Bodily Pain		General Health		Vitality		Social Functioning		Role Emotional		Mental Health	
			Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD
	Overall	72	91.3	18	93.9	17	84.6	16	77.4	15.5	70.8	14.4	95.7	10.7	93.1	15.8	84.9	18.5
Men	Total	40	95.2	14.7	95.3	15.4	84.6	15.1	77.4	17.6	74	12.3	96.5	9.8	92.5	17.7	82.3	12.2
	40-49	14	95.7	6.3	96.2	13.9	83.3	19.4	81	24.2	73.9	12.3	96	7	88.1	21.1	85.1	9.6
	50-59	17	96.5	4.4	98.4	6.5	90.2	9.5	78.7	14.4	75.3	14.1	96.1	13.6	97.9	8.9	79.1	14.3
	60-78	9	86	16.1	87.5	26.7	76.7	13.3	70.4	8.9	72	9.2	97.8	4.7	90	22.5	84	11.3
Women	Total	32	86.3	20.7	92.2	19	83.3	17.3	81.3	12.7	66.7	16	94.8	11.9	94	13	88.3	24
	40-49	21	87.9	20.7	90.8	20.8	84.1	19.4	74.6	13.5	67.1	16.7	94.7	11.4	98.1	7.9	91	27.8
	50-59	9	81.7	23.4	93.8	23.5	82.7	12.6	80.6	11.8	62.8	15.4	95.1	14.8	83.3	17.8	81.8	16
	60-74	2	90	7	100	0	100	0	79.2	0	80	0	94.4	7.9	100	0	88	0

Appendix 5

HEALTH AND FITNESS

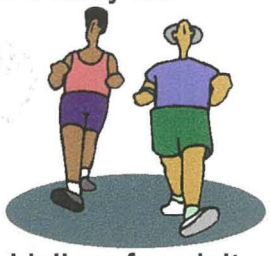
FOR EVERYDAY

HEALTH AND FITNESS

There are great ways to keep on top of things by making good choices when it comes to healthy eating and activity. Small lifestyle changes now can have large benefits later.

The benefits of health eating and regular activity are

- to keep a healthy weight
- to be energetic
- to reduce the risk of heart disease
- to socialise, relax and have fun



Several health organsaitons have developed guidelines for adult New Zealanders to achieve optimum health.

The Hillary Commission

recommends that adults should be moderately active for at least 30 minutes each day or around 2.5 hours per week.

Moderate activity consists of brisk walking, cycling, jogging, lawn mowing, gardening, swimming.

How to start

Make it a habit
Avoid boredom
Write down your progress
Be flexible
Challenge yourself
Be patient

A suggested programme for walking.

Weeks 1-2: walk 10 minutes every second week day and 10 minutes at the weekend

Week 3-4: walk 15-20 minutes every second week day and 30 minutes at the weekend

Weeks 4-5: walk 20-30 minutes most week days and 30 minutes at the weekend.

FOOD FOR HEALTH

The Ministry of Health

has developed Food and Nutrition Guidelines aimed to help people make choices about what to eat to keep healthy.

1: eat a variety of food from the four major food groups,
fruit and vegetables - 2 serving of fruit and 3 serving of vegetables
breads and cereals - at least 6 servings per day
milk and milk product - at least 2 servings per day
lean meats, chicken, seafood, nuts, eggs or pulses - at least one serving per day.

2: Prepare meals with minimal added fat (especially saturated fat) and salt.

3: Choose preprepared foods, drinks and snacks that are low in fat (especially saturated fat) salt and sugar.

4: Maintain a healthy body weight regular physical activity and by healthy eating

5: Drink plenty of liquids each day

6: If drinking alcohol do so in moderation.

Serving size examples:
1/2 cup of salad, 1 potato,
1 piece of fruit
a slice of bread, 1 cup of potato, 1/2 cup muesli, 250ml of milk, 1 pottle of yoghurt
2 slice of cooked meat, 1 medium steak, 1 egg, 1 chicken leg

Fun and Friends

- eat together and make meal times a social occasion
- try new foods and look for food that has the Heart Foundation tick on the packaging
- physical activity is fun so explore new places and try new skills

Remember

its never too late to start and any activity is better than none.

Want to know more

contact

The Hillary Commission 0800 ACTIVE, 0800 228483

The National Heart Foundation 09 5246005

The Ministry of Health http://www.moh.govt.nz

Your local Public Health Centre or City Council

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