NORTHERN IRELAND HEALTH AND ACTIVITY SURVEY

MAIN FINDINGS

HEALTH & ACTIVITY SURVEY

THE NORTHERN IRELAND HEALTH AND ACTIVITY SURVEY

PROJECT STEERING GROUP

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The principal funders of the survey were:
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Health Promotion Agency for Northern Ireland (HPANI);
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A report on the findings of the survey has been prepared by Dr Domhnall MacAuley and is available from HMSO. This summary report, based on the main findings, has been prepared by Frank Kelly, Health Promotion Agency for Northern Ireland, and Dr Shaun Ogle, Sports Council for Northern Ireland on behalf of the Technical Sub-Group of the Main Project Steering Group. Additional copies can be obtained from the funding organisations or HMSO.

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THE NORTHERN IRELAND HEALTH AND ACTIVITY SURVEY

Summary of the Main Findings

Message from the Project Steering Group Chairman

THE Northern Ireland Health and Activity Survey is one of the most rigorous and comprehensive assessments ever carried out on levels of physical activity and fitness and their relation to health.

The research, adapted from a similar study - The Allied Dunbar National Fitness Survey carried out in England - has produced results clearly indicating the benefits to health of regular exercise, but that only a minority of the province's population is enjoying these benefits.

The baseline information evidencing such facts is the central product of this complex study and provides a reliable starting point for the several agencies concerned with the adult population's health-related fitness and activity patterns.

As chairman of the Project Steering Group I am honoured to have been involved with an initiative of this quality and significance. The coming together of statutory, private, charitable and commercial organisations to a common purpose is rare, if not unique, and indicates something of the order of cooperation, expertise and finance that was required to make the survey happen.

I thank all colleagues on the Steering Group for their commitment and patience over the past three years - and I am especially beholden to the experts who managed the survey, analysed the information and interpreted the findings, namely the Principal Investigator - Dr Domhnall MacAuley and the Technical Sub-Group led by Professor Philip Reilly and including Dr Liz McWhirter, Dr Colin Boreham, Dr Tom Trinick, Dr Kevin Sweeney, Professor Alun Evans and Dr Shaun Ogle, the Business Manager. There were, of course, many others to whom I and other members of the Steering Group were most grateful, not least Miss Margaret McClintock who acted as Administrative Assistant.

The funding and support organisations are listed and sincere appreciation is expressed to all for responding to the Steering Group's entreaties which had to be made, in some instances, more than once.

J E 'Dusty' Miller
Chairman of the Northern Ireland Health and Activity Survey Steering Group and former Director of the Sports Council for Northern Ireland.

FOREWORD

THE findings of the Northern Ireland Health and Activity Survey should be of interest to a wide range of organisations and individuals.

Information collected is designed to:

- assist Government in developing policies and setting targets for increasing the physical activity and fitness of the population;
- help the agencies who promote health, fitness and sport to develop more effective policies and programmes;
- increase individual awareness of the benefits of an active lifestyle;
- provide a benchmark for measuring changes in physical activity levels and attitudes to exercise in the future;
- develop scientific understanding of physical activity and identify possibilities for further research.

The survey represents a significant step forward in local knowledge about physical activity, and will guide the setting of realistic targets for physical activity.

It is hoped that the information contained in it will be used as a basis for future coordinated work and ultimately the achievement of a fitter, more active and healthier population in Northern Ireland.

Contents

INTRODUCTION

Introduction

DURING the last 15 years different surveys undertaken in Northern Ireland have collected information on involvement in physical activity.

The Northern Ireland Health and Activity Survey (the survey) with its unique combination of personal assessment of activity, fitness and health and a series of more objective scientific assessments, represents the most comprehensive and rigorous attempt to measure activity and its influence on illness and health to date.

The survey draws heavily on the 1991 Allied Dunbar National Fitness Survey carried out in England, replicating the methods of measurement of activity and fitness.

In addition, blood sampling offered a further measurement of the possible association between activity, fitness and health (see page 30).

Survey aims

The Northern Ireland Health and Activity Survey was concerned with answering two broad questions:

How physically active is the adult population of Northern Ireland?

Does physical activity lead to a healthier and/or fitter adult population?

Survey objectives

The survey had the following specific objectives:

To describe the levels of physical activity, fitness and health of the adult population.

To compare levels of activity, fitness and health with the adult population of England.

To study the relationship between physical activity and health.

To study the relationship between physical activity and fitness.

The sample

A representative sample of the population aged 16 and over was obtained by randomly selecting 1,600 addresses from the Northern Ireland Rating and Valuation lists.

The sample chosen generated 1,456 usable addresses or a 70% response rate (one person from each household was selected for interview).

Of those who answered the questionnaire, 62% undertook all or parts of a physical appraisal and gave a fasting blood sample.

How was physical activity measured?

A QUESTIONNAIRE was used to ask people to rate their own state of health and fitness, and to assess how physically active they had been during the last four weeks, over the last year, and since 14 years of age.

Physical activity was broadly defined to include that undertaken in work, at home, and in leisure time.

Physical activity, not just that associated with sport and active recreation but rather a person's involvement in a broad range of physical activities, was recorded.

A person's own assessment of physical activity, its duration and intensity was graded on a scale between 0 - 5.

This was carried out by assigning to each activity an energy score based on the number of kilocalories expended for each minute an activity was performed. Activity was graded as - **light, moderate** or **vigorous**.

Light activity, such as a long walk at a slow pace, or decorating, uses between two and five kilocalories per minute.

Moderate activity, such as walking at a fast pace, or digging the garden uses between five and seven and a half kilocalories per minute.

Vigorous activity, such as exercise causing sweating or shortness of breath uses seven and a half or more kilocalories per minute.

The survey aimed to go further than simply describing how active people are. It attempted to answer the more difficult question of whether people were active to levels which might be benefiting their health and fitness.

The survey used the Allied Dunbar National Fitness Survey adaptation of the American College of Sports Medicine's recommendations (1978) on the amount of moderate and/or vigorous activity a person should take to reduce the risk from coronary heart disease or a stroke.

Table 1: Activity level scale

Level	Activity occasions of 20 minutes duration in the previous four weeks
0	No moderate or vigorous activity lasting 20 minutes
1	1 to 4 occasions of at least moderate activity
2	5 to 11 occasions of at least moderate activity
3	12 or more occasions of moderate activity
4	12 or more occasions mixed between moderate and vigorous activity
5	12 or more occasions of vigorous activity

Repeated on inside back cover to allow continuous reference.

How was physical activity measured?

Table 2: Target levels of activity

Age group	Target levels (men)	Target levels (women)
16 - 34	Activity level 5	Activity level 4 and above
35 - 54	Activity level 4 and above	Activity level 3 and above
55 - 74	Activity level 3 and above	Activity level 3 and above

Repeated on inside back cover to allow continuous reference.

It is important to stress the provisional nature of these target thresholds. The survey found no simple causal relationship between fitness and health and being active at or above these recommended thresholds.

The study found that regular moderate activity outside of sport and recreation (at level 3) can also provide health benefits.

These target thresholds are derived from the Allied Dunbar Survey's adaptation of worldwide research findings which have indicated some of the following health benefits from involvement in physical activity:

1. Reduced risk of coronary heart disease.
2. Better management of body weight.
3. Better control of blood pressure in cases of mild hypertension.
4. Increased stamina and reserves of energy to cope with extra or unexpected demands.
5. Reduced risk of obesity-related diseases.
6. Reduced stress, improved mood and increased self esteem.
7. Prevention of brittle bone disease - osteoporosis.
8. Improved management of non-insulin dependent diabetes.

The survey focused on benefits 1 - 4 and found that there is strong evidence to suggest an association between regular physical activity and these benefits.

How was physical fitness measured?

PHYSICAL fitness is defined as fitness for everyday living. As with physical activity, emphasis was placed on fitness to carry out everyday tasks.

A questionnaire was used to gain a self assessment of physical fitness. In addition, physical fitness was measured using the following scientific tests:

- body fat and its distribution;
- muscle function;
- aerobic fitness assessed by cardio-respiratory response to exercise using a treadmill (the appendix provides a fuller explanation of these tests).

To measure aerobic fitness two assessments were made.

Firstly, sub-maximal fitness or the ability to sustain sub-maximal activity for a prolonged period of time. A rise in this threshold indicates an improvement in ability to sustain sub-maximal activity.

Secondly, a measure of maximal oxygen uptake (VO_2 max) was taken.

This was estimated from the sub-maximal test by extrapolation, in order that people did not over-exert themselves.

Full details of these tests are contained in the main report of the survey.

How was health measured?

A THREEFOLD categorisation of health status was drawn up based on people's self assessment of health:

- **Health problems** - difficulties in performing everyday tasks such as going shopping and looking after children.
- **Health threshold** - derived from the prevalence of chronic medical conditions such as angina or arthritis.
- **Common symptoms** - reported in the previous four weeks such as colds and indigestion.

The Dundee Coronary Risk Score was used to estimate risk of cardiovascular disease.

A score is arrived at from a combination of measurements of cholesterol, blood pressure and smoking habits.

BLOOD SAMPLES

Blood samples were collected to study the effect of physical activity on body metabolism.

Measurements of serum lipids, apoproteins, blood count and blood viscosity were made.

In addition blood was analysed for insulin sensitivity, and antioxidant status.

Activity, Fitness and Health

Beliefs and Attitudes

How active did people think they were?

THREE separate questions were asked to assess how people felt about themselves in terms of activity, fitness and health.

Each was phrased in such a way that respondents had to compare themselves with other people of their own age.

- Seven out of ten people of all ages considered that they were either fairly or very physically active.
- Four out of ten men and five out of ten women who were classified as inactive at Level 0, still believed they were either fairly or very physically active.
- Eight out of ten people in Northern Ireland believed that exercise was important in determining health. However, overall nearly half of men (47%) and over half (54%) of women were below activity Level 3, the minimum recommended threshold.

How fit did people think they were?

- Four out of ten men and five out of ten women classified in activity Level 0 considered themselves to be either fairly or very fit.
- Seven out of ten men and six out of ten women aged 16 - 34, who failed to reach recommended activity levels considered themselves to be either fairly or very fit.

How healthy did people think they were?

Table 3a: Self-assessment of health related to activity thresholds - men

	Self-assessment of health				
Threshold level	**Excellent**	**Good**	**Fair**	**Poor**	**Activity level**
Age 16 - 34					
No moderate or vigorous activity	0	41	57	3	Level 0
Below activity threshold	16	53	27	4	Levels 1 - 4
Above activity threshold	15	55	27	3	Levels 5
Age 35 - 54					
No moderate or vigorous activity	11	34	48	7	Level 0
Below activity threshold	18	50	29	3	Levels 1 - 3
Above activity threshold	15	59	24	0	Levels 4 & 5
Age 55 - 74					
No moderate or vigorous activity	10	38	39	13	Level 0
Below activity threshold	13	43	37	7	Levels 1 & 2
Above activity threshold	13	75	8	0	Levels 3 - 5

How healthy did people think they were?

Table 3b: Self-assessment of health related to activity thresholds - women

	Self-assessment of health				
Threshold level	**Excellent**	**Good**	**Fair**	**Poor**	**Activity level**
Age 16 - 34					
No moderate or vigorous activity	14	51	29	0	Level 0
Below activity threshold	6	62	31	1	Levels 1 - 4
Above activity threshold	20	58	22	0	Levels 5
Age 35 - 54					
No moderate or vigorous activity	8	57	24	11	Level 0
Below activity threshold	10	60	21	6	Levels 1 - 3
Above activity threshold	18	45	34	4	Levels 4 & 5
Age 55 - 74					
No moderate or vigorous activity	5	36	43	16	Level 0
Below activity threshold	9	47	36	10	Levels 1 & 2
Above activity threshold	17	52	28	0	Levels 3 - 5

- Significantly eight out of ten men and women who took no moderate or vigorous activity regarded themselves as in either good or fair health.

What motivated people to exercise?

- Eight out of ten adults perceived regular exercise to be important or very important for anyone who wished to be healthy.
- Over half the adult population (53%) took part in exercise as a means of relaxation.
- The main motivating factor for women's participation in exercise was the improvement or maintenance of health.
- The main motivating factor for men's participation in exercise was to 'feel in good shape physically'.
- About two thirds of men (65%) and women (66%) considered that exercise could be fun.

What stopped people exercising?

- One third of all men and over half of all women (55%) cited not being 'the sporty type' as a reason for not exercising.
- Almost one in four people aged 35 - 54 stated that they were 'too fat' to exercise (see section on 'How healthy were people's lifestyles?' for percentage of population overweight and obese).
- Over a third of men (36%), and almost a half of all women (49%) stated that lack of time prevented exercise.
- A quarter of non-participating women said that the lack of a 'sporting companion' acted as a disincentive to exercising.
- Availability of facilities, cost of participation or long-standing health problems as a result of sporting participation were relatively unimportant barriers to exercise.

Activity, Fitness and Health

The Findings

How active were people?

EXTREMES of activity and inactivity are more pronounced among the population of Northern Ireland compared to England.

Table 4: Activity levels for men and women in Northern Ireland and England

Activity level	Men %		Women %	
	Northern Ireland	England	Northern Ireland	England
Level 5	21	14	6	4
Level 4	9	12	9	10
Level 3	22	23	31	27
Level 2	8	18	17	25
Level 1	18	16	17	18
Level 0	21	17	20	16
Total	100	100	100	100

Comparison with England

- In comparison with England, men in Northern Ireland were more likely to be active at Level 5.
- Similar proportions of women were active to Level 4 and over.
- More men and women were inactive in Northern Ireland.
- Overall 13% of the adult population of Northern Ireland took part in 12 or more occasions of vigorous activity lasting at least 20 minutes in the previous four weeks compared to 9% in England.

Table 5a: Activity achieved and target levels for age groups - men

Age group	16 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74
Activity level	%	%	%	%	%	%
Level 5	30	34	22	15	9	1
Level 4	16	16	10	3	0	0
Level 3	16	20	24	32	24	18
Level 2	7	7	8	6	12	9
Level 1	21	14	22	16	23	18
Level 0	11	10	14	29	31	54
Total	100	100	100	100	100	100

Recommended activity levels for age groups.

Table 5b: Activity achieved and target levels for age groups - women

Age Group	16 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74
Activity level	%	%	%	%	%	%
Level 5	5	11	4	6	5	3
Level 4	14	15	9	5	6	0
Level 3	35	31	34	25	40	23
Level 2	17	16	22	15	14	18
Level 1	18	16	20	14	11	19
Level 0	11	12	11	35	25	36
Total	100	100	100	100	100	100

Recommended activity levels for age groups.

How active were people?

- Seven out of ten men and eight out of ten women fell below the recommended activity levels considered likely to confer a cardio-protective health benefit.
- Two out of ten people are largely sedentary, having achieved no level of activity lasting for at least 20 minutes in the previous four weeks.
- Even among those in the youngest age groups the large majority failed to reach recommended levels. Of those aged 16 - 24, seven out of ten men and eight out of ten women were below the target threshold likely to confer a health benefit.
- Eight out of ten men aged 45 - 54 failed to meet the target threshold.
- Activity declines sharply with increasing age so that one in ten people aged 16 - 24 were inactive compared to five out of ten aged 65 - 74.
- Activity levels varied with social and economic status. Those classified as non-manual were two and a half times more likely to be physically active than those in the manual social classes.
- Six out of ten men who were inactive, or only achieved light levels of activity, held no educational qualifications.
- Among women, almost one quarter (23%) of those vigorously active were educated to degree level, compared to 12% vigorously active who were not educated to degree level.
- No significant differences in physical activity levels were found between Catholics and Protestants.

How fit were people?

PHYSICAL fitness was measured in terms of:

- Muscle function, that is hand grip strength; strength and power of legs; and, the range of movement of the shoulder joint or flexibility.
- Aerobic fitness was assessed by cardio-respiratory response to exercise.

MUSCLE FUNCTION

- One in ten women had insufficient hand grip strength necessary for many tasks associated with daily living - such as opening containers, and holding or carrying.
- Over one quarter (29%) of the adult population would have difficulty in climbing stairs without having some assistance or would only be capable of doing so unaided at a very slow rate.
- In terms of ability to lift even one half of one's body weight (important for getting out of a chair) four out of ten men and six out of ten women aged 55 - 74 would find difficulty.
- There was a marked deterioration in flexibility with age, as two out of ten men and over a quarter of women (29%) aged 55 - 74 failed to reach recommended flexibility thresholds.

AEROBIC FITNESS

- The proportion of men and women unable to sustain uphill walking at three mph on a five degree slope, rose from less than one out of ten men aged 16 - 34, to over six out of ten men aged 55 - 74. For women the equivalent figures rose from two out of ten, to nine out of ten.
- There was a strong age related decline in aerobic fitness, measured using VO_2 max.
- Men had greater VO_2 max at all ages than women.
- Evidence from the study showed no relationship between past activity, at any level, and VO_2 max.
- The majority of men and women aged 54 and over who do not exercise at or above recommended physical activity thresholds cannot exercise moderately without exceeding their anaerobic threshold and would experience difficulty in walking at a moderate pace (three mph) for any prolonged period without showing symptoms of breathlessness and fatigue.

How healthy were people's lifestyles?

AS WELL as measuring health status in terms of difficulty in performing everyday tasks, chronic medical conditions and common symptoms, the survey also looked at the risk of coronary heart disease.

- Over half of the population of Northern Ireland were overweight. Almost six out of ten men in Northern Ireland were found to be overweight compared to less than five out of ten men in England. The figures for overweight women in Northern Ireland and England are identical at 56%.

- Levels of clinical obesity in Northern Ireland are higher than those in England. Using guidelines from the Royal College of Physicians, 16% of men in Northern Ireland compared to 8% in England were obese. For women the equivalent figures are 21% and 19%.

- There was a continuous increase in fatness with age, this was most pronounced after the age of 35, particularly in women.

- Risk of cardiovascular disease in men and women appears to be related to the distribution of body fat. In particular, risk of stroke or heart disease has been linked to the ratio of waist girth to hip girth.

  The critical threshold for cardiovascular risk is 1.0 in men and 0.8 in women. Over two out of ten men in Northern Ireland (21%) compared to just one out of ten men in England (11%), exceed the threshold.

  For women, over two fifths (42%) exceeded the threshold, as compared to (49%) of women in England. These figures suggest that large numbers of people in Northern Ireland are at risk from coronary heart disease, based on this one indicator alone.

- Three out of ten men (31%) and women (32%) were currently smokers.

- Similar proportions of men (8%) and women (7%) aged 16 - 34 were ex-smokers. Whereas 25% of women aged 55 - 74 were ex-smokers, among men this proportion rises to 50%.

- Of those who smoked, five out of ten men and almost four out of ten women (39%) smoked more than 20 cigarettes a day.

- More than four out of every five men (81%) and seven in every ten women (70%) drank alcohol at least occasionally.

- A total of 55% of men drank alcohol at least once per week compared to 30% of women. Almost two out ten men (19%) and three out of ten women (30%) never drank while a small proportion (men 6%, women 2%) drank alcohol on a daily basis.

- Just over two out of ten (22%) men consumed in excess of the recommended threshold level of 21 units per week and more alcohol was consumed in the middle years of life between ages 25 - 54 than among the older and younger age groups.

- Almost one in ten women consumed alcohol in excess of the recommended threshold for women of 14 units per week (8%).

How were people active?

OVERALL, people in Northern Ireland were physically active in a variety of ways.

- Although home-based activities including housework, gardening, decorating, washing the car etc. were recorded by six out of ten men and eight out ten women, they contributed very little in terms of meeting recommended target levels.
- Physical activity at work was not a major contributor to overall levels of activity. Seven out of ten men and nine out of ten women undertook no moderate or vigorous activity at work.
- Caring duties, including looking after family and children, and climbing stairs contributed very little overall in terms of meeting recommended activity levels.
- Over half of all men (51%) and 45% of women were active through sport and physical recreation.
- Compared with England (66%), significantly more males aged 16 - 34 in Northern Ireland (74%) were active through sport and recreation.
- There were no significant differences in levels of activity in sport and recreation between women in Northern Ireland and England.
- Four out of ten men and women in Northern Ireland were active at a moderate level or above through walking in comparison with two out of ten people in England.
- Significantly more men (31%) and women (20%) aged 16 - 34 in Northern Ireland compared to men (16%) and women (9%) in England achieved at least Level 1 through cycling than their counterparts in England.
- Among men the three most popular sporting activities in the four week period before interview, were cycling (18%), football (17%) and exercises (17%).
- Among women, the three most popular sporting activities in the four week period before interview, were dancing (17%), swimming (16%) and cycling (14%).
- During the last year the three most popular activities for men were cycling (37%), swimming (30%) and football (27%). Among women, the three most popular sporting activities were swimming (34%), dancing (27%) and cycling (26%).
- After the age of 14 the most popular sporting activities amongst men were cycling (53%), football (46%) and swimming (29%). Among women, the three most popular sporting activities were cycling (36%), social dancing (30%) and swimming (29%).

How did physical activity relate to fitness?

INDIVIDUAL physical fitness is not necessarily related to physical activity. Levels of aerobic fitness in an individual are associated with age and hereditary factors (fitness levels decline with age). Moreover, there is increasing recognition of the importance of genetic factors in determining an individual's maximal oxygen uptake.

- Using VO_2 max as a measure of aerobic fitness, and after allowing for the influence of age, no relationship was found between activity and aerobic fitness.
- Using a sub-maximal measure of aerobic fitness or the anaerobic threshold as an indicator of functional physical fitness (ability to cope with tasks of everyday living), in general males who were least active were more likely to exceed their anaerobic threshold walking at three mph on the level and up a slight gradient. This represents a significant functional limitation.
- For women, exceeding anaerobic threshold was closely associated with age so that the least active aged 55 - 74 exceeded their anaerobic threshold walking at three mph on the level.
- Shoulder flexibility was found to be significantly related to the highest recorded level of activity in women, but not men.
- After allowing for the influence of age, significant relationships between hand grip and regular physical activity were present for both men and women.
- Knee strength was also significantly correlated with the highest recorded level of activity for both sexes.
- Leg power was found to be significantly related to regular physical activity in men, but not women.
- Using aerobic capacity as a measure of fitness, those with the highest scores displayed fewer coronary risk indicators.

How did physical activity relate to health?

PHYSICAL activity is only one of a number of lifestyle factors which has an influence on people's health. In order to examine the importance of physical activity, therefore, and the contribution it can make to improving health, it is important to take into account other possible influences. After this analysis the following picture emerged.

- Those most active had the lowest coronary risk score.
- There was a significant relationship between past participation in sport and active recreation and the prevalence of health problems. Over half (54%) of all men aged 55 - 69 who reported 'health problems' had been active for less than three quarters of their adult life. By comparison only one fifth (19%) of those who had been active more than three quarters of their life experienced similar health problems.
- More men and women who had been active for less than three quarters of their lives were more likely to suffer from heart disease, angina or breathlessness.
- Lower systolic blood pressure was found among men, but not among women active in sport and recreation for most of their adult lives.
- The average cholesterol level in men was 5.25 mmol/l and in women was 5.37 mmol/l. Using standard guidelines 50% of men and 54% of women exceeded 5.2 mmol/l while 21% of men and 27% of women exceeded 6.2 mmol/l.
- Average cholesterol decreased with increasing physical activity, but only the relationships between cholesterol and regular activity in females and past participation in men were significant after screening for the possible influences of age and other factors.
- There was a relationship between regular physical activity and HDL (Higher Density Lipoprotein) cholesterol in men. The difference between the most active and least active groups was 0.04 mmol/l (3%). There was no significant relationship between activity and HDL cholesterol in women.

How was physical activity related to lifestyle behaviour?

- There was a strong association between being active to recommended levels and non-smoking among men. While one fifth of men active at Level 5 smoked, twice as many inactive men smoked.
- In women, however, those currently smoking or those who were ex-smokers were over twice as likely to be active to Level 3 or higher than non-smokers.
- Compared to non-smokers, current and ex-smokers were less likely to be active at least to Level 3, the minimum level considered to afford a cardio-protective effect.
- Women who were more active were, in general, more likely to consume a healthy diet. However a significant proportion (40%) of women who took exercise to activity Level 5 had, according to current guidelines, a poor diet.
- Among men there were no significant associations between activity and diet.
- Women, but not men, who consumed light levels of alcohol (one to nine units) were approximately twice as likely to be at least moderately active (Level 3) compared to non-drinkers. But women who consume more than ten units a week are less likely to be active.

CONCLUSIONS

Conclusions

THE survey has shown a wide variation in levels of activity among the population. There are those who are regularly active at recommended activity levels and whose health and fitness is of a relatively high standard, and those who are inactive, have associated health problems, and are considerably less fit for everyday living.

While the majority of people claimed to be active, healthy and fit, most had risk factors associated with ill health, particularly coronary heart disease. In general, people overestimate their involvement in physical activity.

Particularly disturbing is the proportion of young adults who feel that they are active to a level conferring fitness and health benefits, but who are actually failing to reach this level.

The vast majority of adults believe in the value of physical activity as a means to maintaining or improving health.

However, the survey clearly shows that only a small minority are sufficiently physically active on a continuing and frequent enough basis to maintain and improve their personal fitness and health.

The health and fitness of the adult population of Northern Ireland, as indicated by reduced prevalence of risk factors associated with coronary heart disease, was found to be lowest among those least active.

People in the non-manual classes are up to two and a half times more likely to be involved in physical activity that improves their health than those in the manual classes.

In terms of the relationship between physical activity and health the overriding message is:

There are clear health benefits from frequent and life-long physical activity - principally through a lower risk of coronary heart disease and fewer health problems.

APPENDIX

Measurement Methods

THE QUESTIONNAIRE

MANY aspects of behaviour, attitudes and beliefs were measured in the home interview. These included:

- Levels of current and past participation in sport and active recreation and barriers to participation.
- Physical activity involved in working, doing housework, DIY and gardening, as well as everyday activity such as climbing stairs, walking or cycling.
- Lifestyle information relevant to health, including issues such as smoking, drinking alcohol and dietary habits.
- Current health status and history of any illness.
- Sports-related injuries.
- Knowledge about exercise and attitude towards physical activity, fitness and health.
- Psychological variables, including well-being, stress levels and social support.

BLOOD SAMPLES

BLOOD sampling offered a completely new dimension and allowed the opportunity to relate activity and fitness to lipids.

Those respondents who agreed to undertake a physical appraisal also provided fasting blood samples.

These were either taken in the respondent's home or at the site of the mobile laboratory.

A full list of blood analysis is contained within the full report of the survey.

THIS included:

- **Body measurements** - including height, weight, skinfold thickness, waist and hip girths.
- **Blood pressure** - to screen those at increased risk of cardiovascular and other diseases.
- **Muscle function** - this included: hand grip strength; the strength of the quadriceps (thigh) muscle; the explosive power of the lower limb.
  These functions are important for everyday living requirements and safe participation in exercise and sport.
- **Shoulder abduction** - the flexibility of the shoulder joint which is particularly important for the elderly, for example in dressing, or reaching for objects above shoulder height.
- **Aerobic fitness** - this was measured using a standard protocol, with a less demanding test being used by people with very low levels of fitness.

  Aerobic fitness was assessed in relation to two key thresholds associated with the levels of energy expenditure required to sustain a reasonable walking pace (about three mph) on level ground and up a 1 in 20 slope without having to slow down a lot or stop completely.

All the measurements were similar to the tests included in the Allied Dunbar National Fitness Survey which had been carefully selected by scientific experts and tested in pilot studies before they were included in the survey.