EVALUATION OF CHANGES TO PHYSICAL ACTIVITY AMONGST PEOPLE WHO ATTEND THE WALKING THE WAY TO HEALTH INITIATIVE (WHI).

- Prospective Survey -

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GLOSSARY

Analysis of variance (ANOVA)

A parametric statistical test that compares between- and within-group variance to measure differences between 2 or more groups.

Chi-square(X^2) test

A non-parametric (does not depend on the underlying distribution of values) statistical test of association used for categorical data. It compares the actual number in each group with the expected number. The strength and direction of the association is not indicated.

Confidence interval (CI)

The computed interval with a given probability (conventionally usually taken as 95%) that the true value of a variable such as a mean, proportion, or rate is contained within the interval.

Confounding

A situation in which the effects of two processes are not separated. The distortion, or negation, of the apparent effect of a factor in relation to an outcome (such as an exposure or risk) which is brought about by the association with other factors that can influence the outcome.

Continuous variable

A variable that may have fractional values, e.g. height, weight and time.

Degrees of freedom (df)

The number of independent units of information in a sample used in the estimation of a parameter or calculation of a statistic. In the simplest example of a 2x2 table, if the marginal totals are fixed, only one of the four cell frequencies is free to vary and the others will be dependent on this value not to alter the marginal totals. Thus, the df is only 1. Similarly, it can easily be worked out that in a contingency table with r rows and c columns, the df = (r-1)(c-1). In parametric tests, the idea is slightly different that the n bits of data have n degrees of freedom before we do any statistical calculations. As soon as we estimate a parameter such as the mean, we use up one of the df, which was initially present. This is why in most formulas, the df is (n-1).

Intention to treat analysis

A method of analysis (chiefly adopted in randomized controlled trials (RCTs)) in which all people (ie. in RCT context: patients randomly assigned to one of the treatments) are analysed together, regardless of whether or not they completed or received that treatment. In this evaluation study an 'intention to treat analysis' simply means that everyone was included in the analysis irrespective of whether they completed a follow-up questionnaire or not. This will have involved imputing 'no change' values at one or both follow-up stages – constituting their baseline questionnaire responses.

Interquartile range

The range of values extending from the 25^{th} to the 50^{th} percentile.

Logistic regression

A statistical analysis most frequently models the relationship between a dichotomous (binary) variable (eg. dead or alive; been on a health walk before or not), and a set of explanatory variables of any kind (such as age, housing tenure, distance from nearest town).

Mann-Whitney U

A non-parametric statistic to compare 2 groups. It is analogous to the *t* test. (see non-parametric statistics).

Mean (Arithmetic)

The Arithmetic average.

Median

The value that divides the frequency distribution in half when all data values are listed in order. It is insensitive to small numbers of extreme scores in a distribution. Therefore, it is the preferred measure of central tendency for a skewed distribution (in which the mean would be biased). If data are Normally distributed, the median will be the same as the (arithmetic) mean.

METs

MET stands for "metabolic equivalent" and is defined as "the ratio of the work metabolic rate to the resting metabolic rate." MET is the rate at which adults burn one kcal at rest: this is approximately 1 kcal per kilogram of body weight per hour (expressed as 1 kcal/kg/hr). Two METs indicates the energy expended is twice that at rest. Three METs is triple the resting energy expenditure, etc. Thus, the METs per hour score is a measure of the intensity of a physical activity. METs based recommendations for physical activity advise that adults undertake at least 30 minutes of moderate intensity physical activity (that is, an activity with an energy expenditure of between 3 and 6 METs) on at least 5 days of the week. Examples of METs values are moderate intensity (3-4 METs): walking at a brisk pace (1 mile in ~20 minutes), playing golf. Strenuous/vigorous intensity activities (>6-10 METs): running, swimming laps moderately fast to fast, cycling 10-16 mph. There may, however, be considerable individual variation.

Multivariate analysis

As opposed to univariate analysis, is a statistical analysis performed in the presence of more than one explanatory variable to determine the relative contribution of each to a single event. It is a method to simultaneously assess contributions of multiple variables or adjust for the effects of confounders. Multiple linear regression, multiple logistic regression, proportional hazards analysis are examples of multivariate analyses.

Nonparametric statistics (distribution free methods)

Statistical methods to analyse data from populations, which do not assume a particular population distribution. Mann-Whitney U test, Kruskal-Wallis test and Wilcoxon's (T) test are examples. Such tests do not assume a distribution of the data specified by certain parameters (such as mean or variance). For example, one of the assumptions of the t-test is normal distribution of the data. If this is not valid, a non-parametric equivalent must be used. If a wrong choice of test has been made, it does not matter very much if the sample size is large (a non-parametric test can be used where a parametric test might have been used but a parametric test can only be used when the assumptions are met). For a small sample size, non-parametric tests tend to give a larger *P* value. In general, parametric tests are more robust, more complicated to compute and have greater power efficiency. Parametric tests compare parameters such as the mean in t-test and variance in F-test as opposed to non-parametric tests that compare distributions. Nonparametric methods are most appropriate when the sample sizes are small. In large (e.g. $n > 100$) data sets, there is less reason to use nonparametric statistics.

Normal distribution

A frequency distribution of continuous data which has the following properties:

1. It is a continuous, symmetrical distribution where both tails extend to infinity.
2. The arithmetic mean, mode and median are identical.
3. Its shape is completely determined by the mean and the standard deviation.

Null Hypothesis

The null hypothesis (H0) represents a theory that has been put forward, either because it is believed to be true or because it is to be used as a basis for argument, but has not been proved. If we conclude "Do not reject H0", this does not necessarily mean that the null hypothesis is true, it only suggests that there is not sufficient evidence against H0 in favour of H1. Rejecting the null hypothesis then, suggests that the alternative hypothesis may be true.

Odds ratio

The probability of occurrence over the probability of non-occurrence.

P-Value

The probability value (p-value) of a statistical hypothesis test is the probability of getting a value of the test statistic as extreme as or more extreme than that observed by chance alone, if the null hypothesis H0, is true (ie. that there truly is no difference). It is the probability of wrongly rejecting the null hypothesis if it is in fact true. The p-value is compared with the actual significance level of a statistical test and, if it is smaller, the result is significant. Thus, if the null hypothesis were to be rejected at the 5% (or 1 in 20) significance level, this would be reported as "$p < 0.05$". Small p-values suggest that the null hypothesis is unlikely to be true. The smaller it is, the more convincing is the rejection of the null hypothesis. It indicates the strength of evidence for say, rejecting the null hypothesis H0, rather than simply concluding "Reject H0' or "Do not reject H0".
(see statistical significance below).

Regression

A statistical method that makes use of the correlation between 2 variables and the notion of a straight line to develop a prediction equation.

Regression coefficient (b)

The rate of change in Y with a one-unit change in X (as represented on a graph).

Regression to the mean

This phenomenon is, in essence, a chance finding masquerading as a real one. RTM occurs with any variable that fluctuates within an individual, either genuinely or due to measurement error eg blood pressure, physical activity levels. RTM occurs when a group of individuals is targeted because they have unusually high (or low) values of a risk variable (or variable of interest). In a group of such individuals the mean level will, on remeasurement, be lower than the starting mean, even without any intervention having occurred. This is due to the RTM phenomenon. Consider a group of 100 persons each throwing a fair die once. Select from the group those who have thrown a six. There might be some 16 such persons. In an effort to cure the 'proneness to throw sixes', each of the selected persons is administered a glass of water and asked to throw the die again. One can expect that all but two or three persons have been cured. This 'success' of the water cure is attributable entirely to the process of selection for treatment.

Standard Deviation

Standard deviation (SD) is a statistic used to measure the variation in a distribution. It is a measure of the spread or dispersion of data in relation to the

mean and is the most common measure of the variability of a set of data. It is the square root of the variance.

Statistical significance (test)

The means of assessing the degree of uncertainty surrounding an hypothesis (such as the hypothesis that there is an association between two variables eg. sex and height). The significance test consists of calculating the probability of obtaining a statistic that is different or more different from the null hypothesis (ie. no difference) than is the case for the statistic obtained in the sample. If this probability is sufficiently low then the difference between the parameter and the statistic is said to be "statistically significant" and the null hypothesis is rejected. The level that is considered '"sufficiently low" is somewhat arbitrary, but is conventionally taken as either $p<0.05$ (where the probability (p) of obtaining the result is greater than 95%, or 1 in 20) or $p<0.01$ (probability greater than 99%, or 1 in 100).

Significance level

The significance level of a statistical hypothesis test is a fixed probability of wrongly rejecting the null hypothesis (H0), if it is in fact true (this also called a 'type I error'). The level is set by the investigator in relation to the consequences of such an error. Generally we want to make the significance level as small as possible in order to protect the null hypothesis and to prevent, as far as possible, making a type I error. Usually, the significance level is chosen to be 0.05 (or 5%).

T-test

A test that uses a statistic which under the null hypothesis has the t distribution. It is a statistical tool used to determine whether a significant difference exists between the means of two distributions.

Transformation to normality

Altering data values in a skewed distribution to produce a normal or nearly normal distribution.

Type I error

If the null hypothesis is true but we reject it, this is an error of the first kind or type I error. This results in a false positive finding.

Type II error

If the null hypothesis is accepted when it is in fact wrong, this is an error of the second kind or type II error. This results in a false negative result.

Univariate analysis

As opposed to multivariate analysis (see above), is a statistical analysis performed with one explanatory variable to determine its contribution to a single event. This takes no account of the contribution of other factors.

Variance

A measure of the dispersion of scores around the mean. It is equal to the standard deviation squared.

Z-scores

Standardised scores calculated by subtracting the mean from an individual score and dividing the result by the standard deviation; represents the deviation from the mean in a normal distribution.

EVALUATION OF CHANGES TO PHYSICAL ACTIVITY AMONGST PEOPLE WHO ATTEND THE WALKING THE WAY TO HEALTH INITIATIVE (WHI).

SUMMARY OF FINDINGS

A sedentary lifestyle represents a major risk factor for the development of a number of chronic diseases. The minimum amount of regular physical activity needed to improve peoples' health and reduce disease risk is 30 minutes of moderate intensity physical activity on at least 5 days a week. Less than half of the English population manage to do this. Brisk walking is the most natural and convenient form of moderate intensity physical activity that is common to all, except for the most seriously frail or disabled individuals. Walking is also ideal as a gentle introduction to exercise for the sedentary and offers a host of benefits, including a sense of social wellbeing. Funded by the Countryside Agency, in partnership with the British Heart Foundation charity (BHF) and other partners, the *Walking the Way to Health Initiative (WHI),* in England, and more latterly, the *Paths to Health Project (PTH),* based in Scotland, with funding from a number of sources including Scottish Natural Heritage and NHS Scotland) have similar aims: to get more people walking within their own communities.

This evaluation of 750 participants attending newly funded WHI/PTH led walks, represents a broad mix of large and small English and Scottish WHI/PTH schemes, and walkers were generally keen to take part. An estimate of the baseline response rate was in excess of 75% (based on the number of questionnaires printed, versus completed returns) with response rates of 80% at 3 months and 74% at 12 months. The socio-demographic characteristics of questionnaire respondents remained very similar at each of the 3 stages of data collection.

Led walk participants who responded in this evaluation were predominantly female (73%), relatively well educated, affluent, young-old (age 65 to 74) and mainly retired. In

terms of their ethnicity, 95% of participants were white, which was representative of Britain as a whole - given the sample's older age profile. A high proportion of participants (~38%) were widowed, divorced or separated, and thus likely to live alone. The majority of participants (85%) who attended the led walks had participated in other led walks before (organisers unspecified). Those who had not attended a led walk before were significantly more likely to represent disadvantaged groups (non-white, less qualified, occupying a worse position on the deprivation index, and registered disabled) compared with other walkers. Overall therefore, the schemes were going some way towards achieving a stated aim of attracting new, relatively disadvantaged people - in socio-economic terms - but they also clearly catered for many people who were disadvantaged in the sense of having an increased risk of social isolation - because they were in an older age-group and living alone.

One fifth (20%) of respondents said that they had problems with health that hampered or discouraged walking and 7% of the sample were registered disabled. A quarter of people had been ill for a whole week (~24%), had had an operation (~9%) or had been bereaved (~12%) within the previous 12 months. These findings, together with qualitative data obtained by the study, revealed that poor health or concerns about heath maintenance affected a high proportion of participants on led walks and that, by funding these walks, WHI/PTH schemes appear to play an important social-psychological support or rehabilitation role for many people who are recovering from an event or crisis.

Led walk attendance and retention was extremely impressive, so that by 12 months into the evaluation, nearly three-quarters (72%) of respondents had been on a led walk at least once a fortnight during the previous 9 months. An overly pessimistic assumption that all non-respondents at 12 months had dropped out from attending such schemes, would still have left 50% of the original participants attending led walks, at least once a fortnight, 12 months on.

Analyses of physical activities data found that 65% of the sample were meeting current recommended levels of physical activity (that is 2½ hours per week of physical activity equivalent to walking at a brisk pace ie. a moderate level of intensity) just from walking; and that the amount of leisure walking that people did contributed substantially to overall physical activity levels. People attending led walks for the first time were less physically active overall than other walk attenders, but their walking levels were similar. In longitudinal analyses, participants who maintained their attendance on led walks reduced their overall physical activity less than those who stopped participating in led walks after month 3. When followed-up at 12 months, peoples' level of participation in led walks during the previous 9 months was found to be positively and significantly associated with their overall 12 months level of physical activity. Therefore, participation in led walks made a significant contribution to overall physical activity.

Respondents who completed 3 month or 12 month follow-up questionnaires exhibited significantly higher overall levels of baseline physical activity than those who did not. Nevertheless, following adjustment for a number of factors - including the fact that some data were missing due to 12 month non-response - overall physical activity levels at 12 months were significantly associated with the number of led walks that people had participated in during the preceding 9 months.

At baseline, most of the walkers (52%) were attending walks described as 'flat/easy' or 'first steps'. Quantitative data analysis and collated individual quotations together suggested that, in many cases, the opportunity to go on led walks could help people to remain generally physically active where they had few or no other acceptable (which generally meant 'accompanied') opportunities for walking. A key benefit of WHI/PTH led walks therefore appeared to centre on maintaining peoples' physical activity levels. Feeling healthier, more 'alive' and increasingly socially connected - amongst those prone to social

isolation - were other key themes that emerged from peoples' comments, in relation to their (continued) participation in led walks.

Amongst 796 comments received concerning extra forms of walking people did since being introduced to Health Walks schemes, nearly a third (30%) of responses stated that extra walking consisted mainly – or entirely – of (led) Health Walks or other forms of group walking. Other examples of the extra walking that people reported since joining these schemes, included independent walking - such as walking more often to shops (instead of taking the car), or walking around the local neighbourhood. There were nevertheless factors that discouraged people from walking around their neighbourhood, and these were chiefly to do with being alone ('no-one to walk with') - which made them feel vulnerable; indeed, approximately one third of people (31% overall, 36% of females) said that they worried about their personal safety in terms of 'being attacked', in relation to walking around their neighbourhood. In addition to such 'external' (environmental) factors, a fifth of people cited health problems as a key factor that discouraged them from walking around their neighbourhood.

As more than half the participants attended walks classed as 'easy' 'flat' or 'first steps', and in view of the fact that many had health problems, more demanding walks may be less appropriate for this group. The finding that WHI/PTH led walks attracted mostly women, in the older age-groups - many of whom live alone - is highly appropriate in terms of WHI/PTH stated aims; as these are the very people who, without the social support, protection and encouragement of the schemes, could otherwise find it difficult to walk regularly and risk becoming inactive.

INTRODUCTION AND BACKGROUND

Background to the study

It is now known that a sedentary lifestyle represents one of the major risk factors for the development of cardiovascular disease - the most common cause of premature death amongst adults in the Western world.[1] This statement is supported by a considerable amount of empirical evidence showing that people who regularly undertake moderate to vigorous intensity levels of physical activity, including brisk walking, have a lower risk of cardiovascular disease (including hypertension[2]) but also, that they have a reduced risk of other chronic diseases, such as diabetes and some cancers.[3-9] Additional evidence of the beneficial effects of physical activity on physical and psychological functioning have been presented for a variety of other medical conditions - including obesity[10], osteoporosis[11;12], arthritis and insomnia[13] - with moderate intensity exercise for middle-aged and older adults emerging as an important adjuvant to the treatment of many diseases.[13]

In elderly people, low functional capacity typically reflects the natural decline in body functions and the effects of chronic disease. It also, however, reflects the concomitant fall in intensity of physical activity which necessarily leads to a loss of overall fitness. Such functional deterioration and attendant muscle weakness can predispose to falls and an overall loss of confidence which may ultimately represent the difference between independent and non-independent living.[14-16]

The precise amount of physical activity that is needed to reduce cardiovascular (and other disease) risk is unclear. Nevertheless, the amount of regular physical activity that is needed to affect a measurable difference to the health status of previously inactive people is known to be relatively small, so that in general, people who are

inactive have the most to gain in overall health benefit from engaging in regular physical activity. Thus, in one study[17], among non-smoking, retired men aged 61-81 the mortality rate among those who walked less than 1 mile per day was found to be nearly twice that of men who walked more than 2 miles per day. This, together with evidence from other studies[18], supports the general view that people who are physically active typically experience a 30% to 50% reduction in relative risk of ischaemic heart disease compared with those with a sedentary lifestyle.[18-20]

A number of health bodies (International and National) – including the UK's Department of Health – have produced similar recommendations for physical activity. Essentially, these advise that adults should undertake at least 30 minutes of moderate intensity physical activity (that is, an activity with an energy expenditure of between 3 and 6 METs) on at least 5 days of the week.[21-24]The proportion of the English population that is not active at this recommended level is approximately three-fifths of men and three-quarters of women. However, between 20% and 25% of the population do not begin to approach this level of activity and are classified as inactive or sedentary.[25]

Brisk walking has the greatest potential for increasing overall activity levels of a sedentary population and for meeting current public health recommendations on exercise.[24] Walking can also potentially have a major clinical role in rehabilitation of patients – particularly elderly people – in primary care. Nevertheless, UK adults generally report only low levels of (both the amount and intensity of) walking.[26] A desirable functional target is that middle aged adults should be able to walk a mile at a rate of 3 miles per hour on a slope of one in twenty, without the need to breathe hard and without serious discomfort.[27]

The Walking The Way To Health Initiative (WHI) & Paths to Health Project (PTH)

'Walking the way to health' (WHI) is a nationwide initiative of the British Heart Foundation (charity) in partnership with the Countryside Agency [further information is available from http://www.whi.org.uk/]. The scheme has also benefited from additional funding from the New Opportunities Fund and partner bodies. The five-year initiative began in England in October 2000 and total funding has exceeded 12 million pounds. The Paths to Health Project (PTH), based in Scotland and officially launched in September 2001, was jointly created by the British Heart Foundation and the Paths for All Partnership. It receives funding support from the New Opportunities Fund, Scottish Natural Heritage, and NHS Health Scotland (although in the early stages of this evaluation, support for PTH schemes mainly took the form of training – rather than financial support, as such). The PTH maintains close working links with the WHI in England and has similar aims. This evaluation extended its initial brief to include a number of walks representing the PTH.

The WHI/PTH schemes have a specific aim of encouraging sedentary adults to become more active by attending 'Health Walks' - and to enjoy numerous health benefits that accrue from this - particularly a reduction in the risk of cardiovascular disease. The initiative aims to get more people walking within their own communities, especially those who take little exercise or live in areas of poor health.

The short definition of a 'Health Walk' is a purposeful, brisk walk (in other words more than just a stroll) undertaken on a regular basis. It can include any walk which is specifically designed and carried out for the purpose of improving an individual's health, and is a structured or semi-structured activity which occurs on a regular basis as part of an individual's exercise regime.

The WHI aimed to set up 200 local WHI schemes, within which a number of different walks could be run representing, for instance, different geographical locations, level of difficulty, length of time needed to complete. Walks could also be geared to suit the needs of particular groups of people, such as those wishing to rehabilitate following a period of illness, or designed to suit or encourage the involvement of particular social/cultural groups such as 'women with small children' or people from particular ethnic minorities.

The vast majority of WHI/PTH schemes employ trained walk leaders whose role is to set up, generally organise and lead walks, assisted by volunteers.

Evaluation of the effects on peoples' physical activity levels (particularly of those who were previously sedentary) that occur as a result of participating in WHI schemes is recognised as being extremely important.

Aims and objectives of the evaluation study

The objectives of the evaluation study were to identify the extent of changes to physical activity levels amongst participants in local WHI schemes (and more latterly, a sample of PTH schemes also). Specifically, to identify:

1. Where people were on the sedentary to active continuum when they first joined a local scheme.
2. How their attitudes to walking and levels of walking and other physical activity changed during their participation.
3. The factors which encouraged, and barriers which deterred their continued participation and adherence to walking schemes (led walks).
4. The factors which encouraged, and the barriers which deterred them from continuing with walking outside the aegis of local schemes (led walks).

METHODS

Sampling and recruitment

Sample size

At the start of the project, information provided by the Countryside Agency (CA) informed an estimate that, in England, between 60 and 70 new local led health walks schemes would commence annually from the Summer of 2001 onwards. The study's aim was to include between 25 and 50 percent of these schemes in the evaluation. However, Health Walks schemes were known to vary in size (number of participants) and information regarding demonstration WHI projects suggested that around half of the projects would be large and half small, with large projects expected to yield around 20 respondents, and small projects averaging 10. This resulted in a total projected baseline sample size of ~600 people. In addition, around 25 new schemes were expected to commence in Scotland from Spring 2002. The evaluation would also seek to include participants from 8 of these schemes (4 large, 4 small) totalling ~120 participants. This produced a projected total of approximately 720 study participants at baseline - a sample size that would enable us to report results with a precision (95% confidence interval) of approximately +/- 4%. The study would also have sufficient (approximately 80%) power to detect, at $p<0.05$, a 10% difference in proportions between two groups and a small effect size of 0.2.

The selection of a representative sample of schemes and walks from which to recruit study subjects required information about schemes funded by the CA to be made available to the study researcher, with walk dates reliably set in place. However, such

information was not available for most schemes at the beginning of the study[a], therefore a pragmatic procedure for recruiting to the study was adopted. This involved aiming to obtain a representative sample of walks - in terms of their size, seasonality, urban versus rural characteristics and geographical region based on the sample recruited to date. Thus, as information was obtained regarding Health Walks taking place up to 3 months ahead, decisions about which of these would be approached for inclusion into the study depended upon the characteristics of schemes/walks that had already been recruited, with efforts made to maintain both balance and diversity.

Recruitment of individual walk participants and data collection

The official launch of the study was announced in the WHI newsletter a few weeks ahead of the start date. A research officer was employed (3 days per week) for the duration of the evaluation study, whose role primarily involved data collection and data management (including data entry). Once the study began, when any particular walk was to be targeted for recruitment, walk leaders were contacted in advance, by the research officer, and reminded about the study. They were reassured that little effort would be required of them in relation to the study and that the research officer would attend the walk and recruit the participants.

The research officer attended all walks included in the evaluation[b]. As participants arrived, she introduced herself, provided an explanation of the project, answered any questions that they might have and completed the walk with them. Data

[a] Some walks were already well established and 'up-and-running' with or without funding (funding - where provided – coming from a variety of sources); some schemes/walks were in the process of applying for financial support, but had not yet been formally established; others had had funding agreed, but a considerable lag often occurred between this point in time and the point when a walk leader was both appointed and trained – with walks organised subsequently.

[b] While the research officer attended each walk that was included in the evaluation, on particular dates, the same walk ie. a walk in the same geographical location, might take place quite regularly (eg weekly).

were collected by questionnaire – generally self-completed. Questionnaires were distributed as the walk ended and the researcher generally made a note of brief details (including telephone number) of anyone who received a questionnaire. Some participants completed their questionnaire then and there, although a high proportion of people preferred to take it home with them and return it in a pre-paid envelope. Participants were followed-up at three months and again at twelve months – by post - after the collection of baseline information. This was the method preferred by the vast majority of respondents (almost without exception) although follow-up by telephone interview was also offered.

Where participants did not speak fluent English or had difficulty with completing a questionnaire for some other reason (eg. problems with eye-sight) they were encouraged to obtain assistance with completing the questionnaire from a relative or friend.

Study measures and survey questionnaire

The baseline study questionnaire contained the British Heart Foundation's 'Daily Activities Questionnaire'(DAQ) which measures the amount of physical activity that a person has engaged in during the previous 7 days. A number of studies have shown that people can recall levels of physical activity within the previous 7 days with an acceptable degree of accuracy.[26;28;29] The DAQ is adapted from a validated American measure[30] and the measurement properties of this revised version have been tested scientifically in a previous study (Hillsdon M. et al funded by BHF reference number EPMSCN64).

The instrument gathers information concerning details of named physical activities (number of occasions, length of time representing each occasion and – in the

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Quite often, walk leaders would volunteer to recruit extra new walkers to the evaluation study from the same walk

case of some activities eg. walking, the intensity of the activity) under 9 categories [travel to work by cycle, travel to work by walking, activity at work, activity at home (types of housework), activity in the garden, other activities around the home (types of DIY), walking for leisure, outdoor cycling for leisure, sports and recreation] that a person has engaged in during the previous 7 days. Responses are provided in a standard format that has been shown to be very acceptable to people (obtains high response rates of fully completed data) and which is relatively quick to complete – particularly as not all activities apply to the majority of people.

A small number of additional questions assessed a person's socio-economic status (such as ready access to a car or van, working status and postcode[c]), gender, date of birth, the means by which they travelled to the start of the walk, whether they came alone or were accompanied. In addition, individual questions asked about general health status and past and present smoking behaviour. A final section asked about barriers to walking around a person's neighbourhood.

At the end of the questionnaire, individuals were asked if they minded being followed-up at 3 months and again at 12 months by means of a postal questionnaire, or alternatively, by telephone interview. The follow-up questions repeated the activity-related questions asked at baseline. In addition, a small number of items asked about (i) perceived changes in physical activity and general health (ii) smoking behaviour (iii) frequency of participation in the health walks scheme since baseline (iv) intention to participate in future health walks (v) factors which encouraged or deterred continued participation in the Health Walks scheme and (vi) factors which encouraged or deterred

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when it took place on a subsequent occasion - which the research officer did not attend.

[c] Please refer to 'Deprivation and postcodes data' section below.

walking in other settings. Copies of the study questionnaires may be found in Appendix III at the end of this report.

Deprivation and postcodes data

In addition to questionnaire-based items to assess respondents' socio-economic status, we obtained an Index of Multiple Deprivation (IMD 2004) rating for study participants, based upon their individual postcodes.[d] Indices to help identify areas of deprivation have been used in the UK since the mid-1970s. The IMD 2004 represent the most recent and by far the most comprehensive indices, which replace the IMD 2000. [31]

The IMD 2004 is a measure of multiple deprivation at the small area level and its application was felt to have direct relevance to one of the explicit aims of the WHI: 'to get more people walking within their own communities, especially those who take little exercise *or live in areas of poor health*.'

The model of multiple deprivation which underpins the IMD 2004 is based on the idea of distinct dimensions of deprivation which are experienced by individuals living in an area. The overall IMD is conceptualised as a weighted area level aggregation of seven specific dimensions of deprivation. These are: Income deprivation, Employment deprivation, Health deprivation and disability, Education, skills and training deprivation, Barriers to Housing and Services, Living environment deprivation and Crime.

The *Income Deprivation domain* measures the proportion of people in an area who are living on low incomes. This is done by assessing the proportion who are on means-tested benefits such as Income Support and Working Families Tax Credit. The *Employment domain* measures the involuntary exclusion of the working age population

[d] Scotland produces a similar - but not identical – index to the rest of the UK, which we obtained and applied to the postcodes of Scottish participants in the study. It was then possible to map one system onto the other and produce 5 equivalent groupings (quintiles) for the whole sample.

(men aged 18-64 and women aged 18 to 59) to employment. This is done by looking at people who claim benefits such as Incapacity Benefit or participate in the various New Deal Schemes. The *Health Deprivation and Disability domain* looks at the population for high rates of premature death, or whose quality of life is impaired by poor health or who are disabled. *Education, Skills and Training domains* have two sub-domains that are used to capture deprivation – one that looks at education deprivation for children and young people in the area, and another that looks for a lack of skills and qualifications among working-age adults. *Barriers to Housing and Services* addresses difficulties that local people have in obtaining suitable housing and in accessing local services in terms of distance. The *Living Environment Deprivation* domain comprises two sub-domains: the 'indoors' living environment which measures the quality of housing and the 'outdoors' living environment which contains two measures about air quality and road traffic accidents. The *Crime* Domain measures the incidence of recorded crime for four major crime themes, representing the occurrence of personal and material victimisation at a small area level.[32] IMD 2004 ratings were grouped into 5 quintiles, where quintile 1 represented the most affluent quintile and 5, the most deprived.

Organisation and data management

A research officer (I.B.), was employed for 3 days per week throughout the evaluation study. Based in Oxford, her work involved preparing the ground for attending each health walks scheme to recruit participants, which, in the first instance, required her to obtain information about forthcoming health walks via web-sites and telephone contacts.

Prior experience of the collaborators, suggested that the recruitment of study participants could be maximised by contacting the walk leaders well in advance of any

individual walk in order to ‘get them on board’. In practice, this meant that the research officer spent a considerable proportion of her time contacting health walks leaders, introducing herself to them and explaining the nature of the evaluation in advance of attending the next walk. She also reassured them that she would be doing the work and that no extra effort would be expected of them. Where walks occurred some distance from Oxford (ie. the majority), the research officer generally arranged to stay somewhere locally the night before.

A database was used to enter details of walking schemes and the characteristics of individual led walks, within these, that the researcher attended. These characteristics (eg. distance, degree of difficulty, weather conditions) were noted/rated by the researcher on the day that the walk took place. Standard methods for recording these characteristics were defined at the beginning of the study. This database was also used to record the contact details of participants, the date of their first participation and the future dates regarding follow-up and whether or not questionnaires had been sent out or received back. The overall process of the evaluation was recorded and monitored using this database, and these data were ultimately merged with all other data obtained, by questionnaire, from study participants.

Questionnaire data were entered manually, by the research officer, directly into SPSS statistical analysis software. Ten percent of data were re-entered and checked for accuracy in addition to subsequent ‘data cleaning’ procedures.

Statistical analysis

The analysis was conducted (by J.D. and M.H.) using SPSS and STATA statistical packages with additional advice and assistance obtained from medical statisticians (Ms Louise Linsell and Dr Helen Doll). Inevitably, some of the analyses will

differ very slightly in terms of the denominators of different variables applied according to which analyst, statistical package and procedure was involved, as a small amount of variation can occur due to the application of different rules in computations. This only results in tiny discrepancies that – in view of the large sample size - should not influence any overall results or conclusions.

Exploratory descriptive analyses began with the examination of simple frequency distributions. Variables with a small number of discrete categories (eg. sex, country, age-group) have been compared in contingency tables and any association between socio-demographic variables and other factors, (such as the English versus Scottish sub-groups, and respondents to follow-up stages of the study) has been examined using the Pearson's chi-square test.

Continuous forms of data (eg. age, MET energy values) were formally examined for Normality. Analyses of continuous data involving comparisons between groups have employed non-parametric tests (eg. Mann-Whitney U) only in instances where data were found to be extremely skewed, otherwise, t-tests were employed for making mean comparisons concerning 2 independent groups (eg. males versus females), with analysis of variance (ANOVA) employed where mean values representing more than 2 independent groups were compared (eg. age groups or grades of social deprivation). For some analyses, continuous data have been grouped into quantiles (that is: where distributions are divided into sub-groups of equal proportions such as tertiles, quartiles or quintiles) in order to preserve the contribution of a small number of individuals with extreme values (outliers) in an analysis, while at the same time wishing to avoid any distortion of the results that might otherwise have occurred.

Multivariate analysis (generally linear or logistic regression) has been conducted in order to examine the variation in several possible explanatory variables

simultaneously, in relation to a particular dependent variable – such as 'whether or not a person was walking for leisure at or above minimum recommended physical activity levels'.

For the most complex analyses, (namely those that examined longitudinal physical activity data (energy expenditure), their associations and potential confounders), additional computing procedures have been employed (see below). Three particular issues contributed to this complexity. The first related to the distribution of energy expenditure values at baseline and follow up stages, which was highly skewed. A second issue concerned the fact that not everyone returned follow-up questionnaires and some of the people who returned 12 month follow-up questionnaires were different from those who returned them at 3 months. Because people who returned completed follow-up questionnaires might differ from non-completers, in terms of their continued levels of physical activity, an analysis that only examined data from completers/respondents could have been biased. A third issue concerned the fact that the Health Walks participants were, in the main, quite physically active to begin with (ie. at baseline) – certainly above the population average. Therefore, subsequent mean measures would more likely be lower than at the starting point – simply due to the regression to the mean phenomenon[33] (please refer to the glossary for an explanation of this). Some adjustment for this effect would be necessary in any analyses of changes in physical activity levels over time.

In order to address the issues detailed above, for longitudinal data analyses, all measures of energy expenditure were transformed by taking the logarithm[34]. This improved the Normality of the distribution. The means and 95% confidence intervals (95% CI) were back transformed by taking the antilog. This allowed the (antilogged) final values to be expressed in the original units of MET/hours/week. The antilogged mean is

referred to as the geometric mean. In the final analysis of changes in physical activity during the 12 month evaluation period, adjustment has been made for baseline variables: respondents' age, whether or not they had been on a led walk before and for baseline physical activity levels. The baseline physical activity levels of respondents and non-respondents, at both follow-up junctures, have also been compared directly.

RESULTS

Schemes and walks included in the study.

A list of all English and Scottish schemes and walks that were represented in the study are provided in Appendix I at the end of the report. Details of the size of each scheme (large, medium, small - based on the amount of funding) are shown, as well as the amount of funding that each scheme received (in total, as well as from the Countryside Agency specifically) - when such details were made available.

Table 1 provides details of the characteristics of walks, in relation to study participants, on the day that they were recruited to the study. Some of these details (level of walk difficulty and weather conditions) were not available for a small proportion of walkers (see footnote b on page 10) so that the percentages do not in all cases add up to 100% - which would denote the total sample. Details are also shown separately for English and Scottish participants. This table reveals that the majority of participants attended a walk of between 1 and 3 miles in length (509, 67.8%), with ~40% attending a walk of between 1 and 2 miles long. More than half of the walkers were on a walk characterised as 'flat/easy' (371,49.5%) or 'first steps' (24, 3.2%), although this was not the case for Scottish participants who, in the main, attended walks characterised as 'slight hill/moderate pace'. In around two-thirds of cases (490, 65.3%) the weather conditions were described as 'good', although again, this chiefly applied to the English walkers. Three-quarters of people recruited (567, 75%) were attending a walk during Summer or Autumn (June through November). Nearly two-thirds of walks finished in close proximity to a 'watering-hole' of some kind (eg. café, pub, or informal provision).

Response rate (baseline recruitment)

On the whole, walkers were keen to take part and very few refused, as such. Nevertheless, a small number of people who did not wish to wait around at the end of a walk would, on occasions, leave without obtaining a questionnaire from the research officer and this was more likely to occur on walks that attracted larger numbers of participants and on occasions when it was raining.

Sample and characteristics - baseline

The baseline sample of 750 questionnaire respondents was recruited between 30th April 2002 and 25th March 2004. This included 601 people recruited from English schemes and 149 from Scotland, representing 85 walks in total (69 in England and 16 in Scotland).

Table 2 shows the demographic and health-related characteristics of participants originally recruited to the study and includes a comparison of the English and Scottish sub-groups. Overall, the median age of the sample was 66 years (mean 64.4 years, range 23 – 93) and this was very similar for men and women (mean age: men 64.5; women 64.3, $t = -0.240$ $p=0.810$). English and Scottish participants were also very similar in age, and in relation to many other characteristics. Nearly three-quarters (544/750, 72.5%) of the sample were female and the vast majority (710/750, 95.3%) reported their ethnic origin as white. However, English participants were significantly less likely to be white than were those from Scotland (564/601,93.8 versus 146/149, 98.0% respectively; $p=0.042$). Around one fifth of the sample was educated to degree level while over 40% had no formal qualifications; the Scottish sample was significantly more highly educated (Degree qualification: English 115/601 20.4% versus Scottish 41/149, 29.1%; 2 df $p<0.001$).

Less than half of the sample (318/750, 43.1%) self-rated their health as 'excellent/very good', with English participants significantly more likely to rate their health as only 'fair/poor' (English: 104/601, 17.6% versus Scottish: 13/149, 8.9% 2 df $p<0.001$). Around one fifth (129/750 19.7%) cited 'problems with health that prevent walking' in the section of the questionnaire that dealt with barriers to walking around peoples' neighbourhood, and 51 people (7%) were registered disabled.

More than a third (269/722, 37.3%) of the study sample had been ill for a week or more, had an operation or been bereaved during the 12 months prior to the start of the evaluation.

Sample and characteristics at follow-up stages

Figure 1 is a flow chart that sets out the baseline study recruitment and response rate (questionnaires returned) at each follow-up stage. Of the original 750 study participants recruited at baseline, 603 (80.4%) people returned a completed (that is, at least partially) questionnaire at 3 months and 551 (73.5%) did so at 12 months. However, a proportion of the respondents at each of the two follow-up stages only responded to one of the follow-up questionnaires, thus, more than a third of people (54, 36.5%) who did not return a 3-month follow-up questionnaire did return one at the 12 month follow-up stage. Likewise, just over half (105, 52.8%) of those who failed to return a 12 month follow-up questionnaire, had returned one at 3 months. Four hundred and ninety-seven respondents (66%) completed questionnaires on all 3 occasions.

Table 3 compares the demographic characteristics of baseline versus follow-up samples. Overall, sample characteristics remained extremely constant at all three points of data collection – despite the inevitable loss of some respondents from the study that occurred over time.

Sample characteristics at baseline in relation to Health Walk attendance.

New recruits to Health Walks

A minority of people (114,15.3% overall; English 97,16.2% versus Scottish participants 17, 11.5% , not significantly different [p=0.15]) said that they had never been on a 'led walk' before. **Table 4** compares the characteristics of all people attending a led walk for the first time with all other walkers. Here, a few notable differences were apparent that were also statistically significant (in many cases highly so). First-timers were less likely to be white (white: first-timers 101, 88.6% versus other walkers 605, 96.6%; p=0.004), were less well educated (no qualifications: first timers 60, 55.6% versus other walkers 231, 38.9%; 2 df, p=0.005) and less likely to own their own homes (home-owner: first-timers 80, 72.1% versus other walkers 534, 87%; p<0.001). First-timers were also more likely than other walkers to be registered disabled (disabled: first-timers 18, 16.2% versus other walkers 32, 5.2%, p<0.001) and tended to occupy a worse position on the deprivation index (the likelihood of someone being a 'first-timer' generally increased with each quintile of worsening deprivation; X^2 *trend* p=0.026).

Finally, nearly half (45.9%) of the first-timers had been ill for a week or more, had an operation or been bereaved during the previous 12 months, and this was (borderline) significantly more likely to have been the case for first-timers than for other walkers (first-timers 50/109, 45.9%, versus other walkers 219/609, 36.0%, p<0.001)

Table 5 shows a comparison between English and Scottish sub-groups in relation to the characteristics of participants who had not been on a led walk before ('first timers'). The small number of Scottish 'first-timers' renders statistical tests of any apparent differences between English and Scottish subgroups inappropriate (likely misleading). However, the Scottish first-timers did appear to have rather different

characteristics from their English counterparts: they were more likely to be female, were predominantly in the 'young/old' age-group (65-74), exclusively of white ethnicity, more likely to be married and were generally affluent. Their self-rated health status was also superior and none were current regular smokers – although more than half reported having a current hip, knee or foot problem, compared with 40% of English 'first-timers'. Nevertheless, a larger sample of Scottish participants was needed to test whether these apparent differences were likely to be 'real', rather than chance 'quirky' findings from an unrepresentative sample.

Baseline physical activity levels

At baseline, 741 people provided details of their physical activity during the previous 7 days. **Figure 2** shows histograms representing levels of activity (MET/hours in the previous week) for a number of different types of physical activity reported at baseline. The purpose of the figure is simply to demonstrate the skewed nature of such data in the study population. **Table 6** reports baseline physical activity levels, in detail (MET/hours for the previous week), for various activities, by gender, and for the sample as a whole. This shows that the activity that most people engaged in was leisure walking (this only takes account of walking of at least moderate pace/intensity, equivalent to 3+ METs). The median average MET/hours of walking (at minimum 3+ METs intensity) was 11 (mean 21.59, SD 35.02) overall, for the previous week, with no significant difference found between men and women (men: median 12.25, mean 20.69, SD 23.60; women: median 10.50, mean 21.93, SD 38.46, Z = -1.60 p=0.12). These average amounts of walking are clearly well above the recommended minimum level of at least 2½ hours' physical activity (of any kind) per week at a level equivalent to walking at 3+ METs intensity (ie. the minimum recommendation is 2½ X 3 METs=7.5 MET/hours/week which

compares with a median average of 11 MET/hours/week – for walking alone - in our sample); however, if you add to this all other physical activity that people engaged in, the median was 49.4 MET/hours/week – which is six times the minimum recommended level of physical activity. Nevertheless, within the sample there was also much variation.

Total physical activity levels differed between men and women at baseline, with men significantly more active overall (men: median MET/hours 61.67, mean 75.98 SD 64.74; women: median 46.00, mean 69.48 SD 82.59; Z= -2.63 p=0.009). However, men and women's physical activity levels differed significantly with regard to three particular activities: 'home activities/housework', involving significantly more effort from women than men (Men: median MET/hours 00.00, mean 5.34 SD 13.30; women: median 4.50, mean 12.04 SD 22.85; Z= -7.36 p<0.001), 'DIY', involving significantly more effort from men than women (Men: median MET/hours 3.25, mean 12.15 SD 27.54; women: median 0.00, mean 5.68 SD 28.83; Z= -8.34 p<0.001), and 'leisure cycling', mostly involving men (Men: median MET/hours 0.00, mean 3.54 SD 14.56; women: median 0.00, mean 0.77 SD 4.67; Z= -3.70 p<0.001).

Physical activity in relation to previous (led) Health Walk attendance

Table 7 reports the baseline physical activity levels (mean and median MET/hours for the previous week) for various activities, for the whole sample (that is, the 741 people who provided physical activities data), according to whether respondents had attended a led walk before or not. The data are also broken down by sex. For most activities, values denoting MET/hours were highly skewed and there was a high degree of variation within different comparison groups (as shown by high values for the SD relative to the mean). Overall, people who were new to led walks (first-timers) reported significantly lower baseline levels of physical activity than did others attending health

walks (total MET/hours physical activity in previous week: first-timers median 34.58, mean 66.61, SD 86.87; other walkers: median 51.00, mean 71.27, SD 74.64, Z = -2.46 p=0.014), although their levels of leisure walking were fairly similar.

There were 4 particular types of activities on which the 2 groups differed: First-timers reported significantly more MET/hours of home activities (eg. Cooking, house-work) than did other led-walkers[e] (MET/hours home activities in previous week: first-timers median 4.50, mean 12.62, SD 20.60; other walkers: median 3.00, mean 9.75, SD 20.67, Z = -2.28 p=0.023); however, first-timers reported significantly fewer MET/hours of gardening activities (eg. weeding, planting, digging) (MET/hours gardening activities in previous week: first-timers median 3.17, mean 12.64, SD 22.80; other walkers: median 6.50, mean 17.16, SD 33.86, Z = -2.45 p=0.014) and MET/hours of leisure cycling (MET/hours leisure cycling in previous week: first-timers median 0.00, mean 0.15, SD 1.20; other walkers: median 0.00, mean 1.78, SD 9.39, Z = -2.19 p=0.028). They also reported significantly fewer MET/hours of sport activities (MET/hours applied individually for a variety of named sports) (MET/hours sport activities in previous week: first-timers median 0.00, mean 7.85, SD 16.33; other walkers: median 5.00, mean 14.25, SD 26.00, Z = -3.20 p=0.001) than did the other led-walkers.

Amongst females, the above differences between first-timers and other led-walkers remained statistically significant for home-activities (p=0.019) and sport activities (p=0.002) although the overall level of physical activity did not differ significantly (p=0.07) between these 2 groups. Amongst males (where only 25 individuals were classed as first-timers), only a difference in gardening activity levels was statistically significant between first-timers and other walkers (p=0.006).

[e] Note that this could mean more hours of activity at low levels of intensity or alternatively, a similar number of hours conducted at a higher level of intensity than was the case for other led-walkers.

Characteristics of those walking at recommended levels of intensity

Of the 741 people who provided physical activities data at baseline, nearly two-thirds (484, 65.3%) reported leisure walking at or above recommended levels in the previous 7 days (i.e. equivalent to 2.5+ hours per week at 3+ METs level of intensity: 'at least moderate pace'). **Table 8** reports the results of a univariate analysis of baseline respondent characteristics in relation to walking for leisure at or above the recommended levels of physical activity.

The results show that no single demographic characteristic was associated with walking behaviour, but that walking behaviour did appear to be positively and significantly associated with overall physical activity levels (excluding leisure walking). It was considered possible that some demographic factors might confound (mask or cancel out) or modify the effects of other factors that might be related to walking or overall physical activity levels. Therefore items which, in the univariate analysis, had exhibited a p-value of ~0.5 or below were entered simultaneously into a multivariate logistic regression model to adjust for any such effects. The results of this analysis are shown in **table 9**. This analysis confirmed the finding of the univariate analysis – that following adjustment for various demographic factors - overall physical activity levels (excluding walking) remained the only factor that was significantly associated with walking at or above recommended levels of intensity. Compared with those in the lowest tertile of overall physical activity, those in the most active tertile had 63% increased odds (OR 1.63, CI 1.09 – 2.42, p=0.02) of leisure walking at recommended levels.

Physical activity levels throughout the 12 month period of evaluation

The distribution of energy expenditure values at baseline and follow-up was skewed. Therefore in order to evaluate more fully physical activity across the whole

period of the evaluation, all measures were log-transformed (please refer to earlier section on statistical analysis). **Table 10a** provides details of the summary level (geometric mean and 95% CIs) of mean total physical activity (MET/hours per week) at baseline, 3 months and 12 months, by gender, for participants who completed follow-up questionnaires at each stage. Results here suggest that, if anything, the respondents' mean physical activity levels reduced somewhat from the beginning of the evaluation and that this was particularly the case for women. We considered that people who completed follow-up questionnaires might also be people who were more physically active. Therefore, in **Table 10b** results are shown from repeating the same analysis, only this time, where people did not complete a follow-up questionnaire, their last physical activity observation has been used (carried forward) ie. if someone did not complete a questionnaire at 3 months, then their baseline overall physical activity figure was used and if the 12 month questionnaire was not completed then either the 3 month value was used (if supplied) or the baseline one. Here, the reduced activity levels for men during the 12 month period is slightly more marked, although the difference between the mean values in **tables 10a** and **10b** is not great overall, suggesting that that there was only a small amount of difference in physical activity levels between people who completed follow-up questionnaires and those who did not in terms of their longitudinal changes in physical activity levels.

An analysis was next conducted to test directly whether there had been any difference in baseline physical activity levels according to whether people returned completed follow-up questionnaires or not. Results of this analysis are shown in **table 11.** The results show that respondents who completed 3 month follow-up questionnaires exhibited significantly higher overall levels of baseline physical activity than those who did not (baseline mean MET/hours per week: 3 month respondents 46.9 versus non-

respondents 32.1, p=0.0002). A similar finding was obtained for 12 month follow-up respondents versus non-respondents (baseline mean MET/hours per week: 12 month respondents 47.0 versus non-respondents 34.8, p=0.0008).

Participation in Health Walks schemes during a 12 month period

Table 12 provides details about respondents' led walk participation during the course of the 12 month evaluation based on self-reports at baseline, 3 months and 12 months. This information is also shown separately for the English and Scottish sub-groups. Responses to 2 questions about the perceived effects of Health Walk attendance (effect on overall walking frequency and perceived benefits associated with attendance) are also shown. It is important to note that the number of respondents is reduced at each follow-up stage and that no information about continued participation in health walk schemes was available for people who did not complete a questionnaire. It is likely, however, that non-respondents were more likely than those who completed follow-up questionnaires to have ceased participating in health walk schemes in the interim – for any number of reasons – and results in the previous section hint at this.[f]

At baseline, the vast majority of study recruits (631/745, 84.7%) said that they had been on a led walk before, and more than three-quarters (588/738, 79.7%) had participated in at least one during the previous month. Three months on from recruitment to the study, all but ~5% (29/557) of respondents had been on a led walk during the intervening 3 months and just over two-thirds (390/580, 67.2%) had been on at least one during the previous 7 days. Most (484/557, 86.9%) of the respondents had been on a

[f] In fact, anecdotally, we know this to have been the case as some people took the trouble to return questionnaires uncompleted, stating that – as they had not participated in a led walk recently, they did not think their responses would be relevant. Further efforts were made to obtain a response from such individuals, but there must have been others who felt the same way but who simply did not respond to mailings.

led walk more than once a month, with a considerable proportion (234/557, 42%) having attended at least one per week, on average.

By 12 months following recruitment to the study, all but ~8% (42/528) of respondents had been on a led walk during the previous 9 months and nearly two-thirds (340/537, 63.3%) had done so within the previous 7 days. Most (378/528, 71.6%) respondents had been on a led walk – on average - more than once a fortnight, while nearly a third (173/528, 32.8%) had attended at least one per week, (again, on average), throughout the preceding 9 months. At both follow-up stages, nearly three quarters of the respondents (415/576, 72.0% at 3 months; 379/529, 71.6% at 12 months) said that they did more walking generally since being introduced to the Health Walks scheme.
An analysis was next conducted of peoples' overall physical activity levels (mean MET/hours/week) according to the number of led walks they reported participating in between the baseline survey and 3 months follow-up (see **table 13a**), and between baseline and the 12 months follow-up (see **table 13b**). Results in **table 13a** appear to suggest that peoples' mean overall physical activity levels at 3 months had increased – if anything - according to the number of led walks that they had participated in since baseline, although this finding was not statistically significant. However, the equivalent analysis for overall physical activity levels at 12 months (**table 13b)** was sufficiently pronounced to be statistically significant, thus mean overall physical activity levels at 12 months had increased in line with the number of led walks that people had participated in during the preceding 9 months. This finding was explored further by comparing peoples' physical activity levels at 12 months in relation to the number of Health/led Walks they had participated in during the previous 9 months in an 'intention to treat analysis' (ie. As before, where people had not completed a follow-up questionnaire, their last physical activity observation was carried forward); and then in an analysis which

adjusted for baseline physical activity levels, whether or not a person had previously participated in led walks or not (at baseline) and also for age. Following these analyses, the positive association between level of participation in led walks in the previous 9 months and 12 month level of physical activity remained statistically significant [Logged difference in mean MET/hours/week comparing reference group '0 led walks in previous 9 months' with: 1-17 led walks (effect 0.17, 95% CI -0.3 to 0.6), 18-35 led walks (effect 0.63, 95% CI 0.2 to 1.0), and ≥ 36 led walks (effect 0.46, 95% CI -0.1 to 0.8) X^2 11.84 df 3 P=0.008)].

A final analysis of these issues examined the change in peoples' 12-month level of physical activity compared with that at baseline, by participation in led walks in the previous 9 months for participants who completed 12 month led walk question (see **table 14**). This shows that, overall, participants reduced their level of physical activity between baseline and 12 month follow-up. However, those who maintained their participation in led walks reduced their physical activity less than those who stopped participating in led walks after month 3. The association between 12 month led walks participation and 12 month overall level of physical activity remained after taking account of baseline level of activity, age, and whether the person had been on a led walk prior to the study.

Types of walking people engaged in since participating in a Health Walks scheme

People who said that they did more walking since being introduced to the Health Walks scheme were asked to describe, in free-text, the types of (more/extra) walking that they did.

Responses to this item were generally quite brief and many were not directly relevant (eg. people sometimes used this space in which to record the fact that they

hadn't been on a led walk recently – usually for reasons of poor health - or to simply say that they had always enjoyed walking). A number of distinct themes were discernable however, and these categories and the numbers of responses that related to them are shown in **table 15**.

The most common theme - which represented between a quarter and a third of all comments received (117/414, 28.3% at 3 months and 118/382, 30.9% at 12 months) - was that the main or only type of walking that the person did occurred when they attended a Health Walk or some other organised walking group eg. ramblers association; and one or two people said that they had joined some additional walking groups since being introduced to the Health Walks scheme. The next most common types of (or opportunities for) walking that people named involved generally fairly short walks around where they lived ('local' walking) – including walking to the local shop for the daily newspaper or walking to 'the local' [pub], or walking to the shops. A reasonable proportion of responses indicated that a small proportion of the respondents (between 10% and 15% of responses) engaged in regular/frequent long or demanding walks that included hill walking.

Attitudes to walking and to participation in Health Walks schemes

At both follow-up stages of the study, participants were asked to describe any particular benefits that they had experienced as a result of their participation in a Health Walks scheme. At both follow-up stages, a high proportion (>85%) of respondents said that they had felt particular benefits from their participation in a Health Walks scheme. Many of these people detailed specific examples of the ways in which they had benefited, and a number of examples of these (direct quotes) are presented below.

Responses (free text) to this item were provided by 478 (82%) of respondents at the 3 month stage, and by 431 (78%) at 12 months. These responses were categorised into several broad themes, and where people stated more than one benefit, their text has been categorised according to the first type of benefit that was stated. The results of this process are shown in **table 16**.

At both follow-up stages, the themes that emerged were generally quite similar, and similar proportions of responses related to the same themes. Thus, at both 3 and 12 months, the two most commonly cited benefits of Health Walks participation were 'social contact' and 'improved fitness and energy'; the next most common theme was 'an increased sense of well-being and/or confidence', followed by 'improvements with joint problems and mobility'.

Some full examples of peoples' comments are now given below, according to the category into which the comment was placed:

Social contact (reduced sense of isolation)

A 75 year old woman, widowed, described her ethic origin as 'other':

'I enjoy the company as I live alone, 18 months since I was bereaved but only seems like 3 months'

A 57 year old married man, unable to work who described is general health as 'poor':

'I only meet other people when I go on the walks. It is the only time I get to mix and talk with other people'

A 66 year old, divorced woman from Scotland:

'It's a social outing as much as walking. I have met new friends on the walks'

A 61 year old married woman from the south west of England:

'A chance to chat with people and feel useful. Walking by the sea, getting to know the area better, meeting like-minded people, discussing paths.'

Improved fitness and energy

A 63 year old married man from Scotland:

'Built my strength up since having a heart operation'

A 54 year old married man from Scotland:

'I had more energy, slept better and met lots of interesting people. I became more interested in my local area.'

A 73 year old English widow:

'I have more stamina, confidence. My legs are stronger. Not out of breath anymore. Enjoy the company.'

A 64 year old married woman from the West Midlands:

'I have more energy. It has also helped to control my blood pressure. I have made many more friends.'

A 56 year old woman from Scotland:

'I can now keep up with my husband when we walk. My ankle is getting stronger and I can breathe easier when I walk.'

A 68 year old married man from the West Midlands:

'Keeping fit during the Winter months when the golf course is closed.'

Increased sense of well-being and confidence

A 75 year old widow from the East Midlands:

'I have felt uplifted by scenery and fresh air. Enjoyed getting to know fellow walkers.'

A 65 year old married woman from the East Midlands:

'I've recovered confidence and stamina after a broken leg 2 years ago. Made new friends. Discovered new areas to walk.'

A 55 year old widow from the North West of England:

'I feel good about myself when I make the effort to get up and go out. Good company on the walk. Laughter is the best tonic.'

A 68 year old married woman from London:

'Feeling of achievement and well being; camaraderie on cardiac walk.'

A 76 year old married woman from the West Midlands:

'Mentally, I look forward to Wednesdays – friendship, companionship.'

Improved joint problems and mobility

A 68 year old divorced woman from the South East:

'It's helped my legs. Before they used to ache. Also helped when losing weight'

A 57 year old divorced woman from Yorkshire:

'Keeps joints going – I am disabled – have a problem with mobility and heart disease. Both are aided by gentle exercise.'

A 75 year old widow from the North West of England:

'Keeps me from stiffening up. I enjoy my food from being in the fresh air'

A 65 year old widow from the East Midlands

'Back pain has decreased significantly, my stamina has improved, I'm much more focused, and enjoy being outdoors.'

A 65 year old, married woman from the North East of England:

'I have trouble with my knees but find walking helps to loosen [them] up & I feel I would be a lot stiffer if I didn't go on the walk schemes.'

Incentive to 'get out'

A 43 year old married man from the West Midlands:

'It motivates me to do things eg. shopping, attend the gym. It is helping me to obtain a healthy lifestyle.'

A 68 year old widow from the South East of England:

'I wouldn't just go out for a walk on my own, so benefit from walking for an hour with other people.'

A 78 year old widow from the East Midlands:

'Incentive to walk whatever the weather. Social contact. Feeling of wellbeing following exercise.'

A 67 year old married women who described her ethic origin as 'other':

'It gets me out of the house. Eight of us also meet informally for a walk on our own.'

A 69 year old widow from the South East of England:

'I did have a dog, so the health walks make me go out regularly.'

A 65 year old married man from the North West of England:

'It stops me watching TV'

Improved breathing

A 39 year old divorced woman from the West Midlands:

'It helps with my asthma. Meet new people.'

A 67 year old married man from the West midlands:

'Easier breathing, improved stamina, feel healthier. I now do gym workouts under [an] NHS scheme recommended by Doctor. Progress discussed every 3 months.'

A 75 year old married man from Scotland:

'My breathing and balance are better.'

A 47 year old married woman from the East Midlands:

I'm less out of breath, skin feels better, feeling of general well-being'

A 70 year old married woman from the South West of England:

'Breathing improved and confidence in walking without a stick.'

(Desired) weight loss

A 50 year old unmarried man from Scotland:

'I have lost weight & lowered my cholesterol level.'

A 55 year old widow from the North East of England:

'I have lost weight and feel better both physically & mentally and don't get out of breath.'

A 58 year old married man from the North East of England:

'Four years ago I was 20 stone+. I could barely walk due to weight & back problems. I am now 15 stone, a lot fitter due to walks and gym workouts, and [getting] out and about.'

A 65 year old married man from the East of England:

'Loss of weight, general tone – especially of the legs.'

Improved cardiovascular health

A 66 year old married woman from the East of England:

'Blood pressure reduced, lost weight initially, now stabilised.'

A 60 year old woman, currently separated from her partner, from the West Midlands:

'Reduced my cholesterol level. I have been told I have lost 3% fat to 3% muscle.'

A 54 year old married woman from the East of England:

'Better circulation, tightening of muscles, feel good factor. Don't get so breathless. Able to do other things easier eg. badminton.'

A 56 year old married man from the north East of England:

'My angina is less frequent.'

Sleeping better

A 58 year old married woman from the South East, who described her ethnicity as black Caribbean:

'I sleep better. Blood pressure is better controlled, feel lighter.'

A 58 year old married man from the East Midlands:

'I'm not as tired. Sleep better.'

A 64 year old married man from the North East of England:

'Sleeping better and [my] legs don't ache as much since going walking with the group.'

A 79 year old divorced woman from the south East of England:

'I go to sleep quicker at night! Feel happier, healthier'

Miscellaneous

A 77 year old widow from the South West of England:

'I started after my husband died. I enjoy the company. Most of the walkers are widowed like me.'

A 65 year old married man form the South East of England:

'Walking in company helps overcome niggling pains, [encourages a] more positive outlook on life. Prevents weight gain.'

A 63 year old married woman from the south West of England:

'Last year I had a broken ankle and benefited greatly from support and friendship I received.'

A 67 year old widow from the North East of England:

'Being relatively new to the area I have made friends and gained local knowledge.'

A 59 year old married woman from the East Midlands:

'Loads of benefits. We have the use of a bus, friendly volunteers and leaders, a really friendly group, good company. Enjoy the walks even in Winter.'

A 72 year old widow from the North East of England:

'I'm 72 and feel much younger. I'm sure it's all down to being active. Another benefit is the social side – chatting with people.'

A 73 year old divorced woman from the South West of England:

'I discovered parts of Weymouth I didn't know about when using the car!'

A 52 year old man from the South West of England, who described his ethnicity as 'other':

'I walk more – haven't used the car for two months. My GP notes lower cholesterol and HbA1c [measure of blood sugar/diabetes control].'

Where people first heard about health walks schemes

On the 3 month follow-up questionnaire, respondents were asked how they had first heard about Health Walks, and 571 people (571/602, 94.9%) provided a (free-text) response to this item. These responses were grouped into 10 main categories, which are shown in **table 17.** The four most commonly cited means by which people were introduced to the schemes were: via an advertisement placed in the local newspaper or parish magazine (142, 24.5%); by word-of-mouth from a friend, relative or neighbour (133, 23.3%); via a leaflet or poster distributed by the local council (118, 20.7%); or via a health care provider, such as GP/health centre/rehabilitation group eg. post-myocardial infarction or stroke (103, 18.0%). Details of how first time attenders of led Health Walks learned of their existence, and the types of walks they attended, are provided in Appendix II.

Barriers to walking in respondents' neighbourhood

In one section of the questionnaire respondents were asked: 'Do any of the following apply to you, or to around where you live?' Respondents were then offered 11 statements concerning reasons that might act as a barrier to walking (more) with which they were asked to agree or disagree. These statements, together with peoples' responses, at baseline, (if they agreed with a statement) are shown in **table 18**. Responses given by men and women are also compared.

The most common reason people cited for walking less than they might around their neighbourhood, was 'worry about personal safety' – with almost a third of respondents citing this as a barrier to walking more (201/659, 30.5%). Women were significantly more likely to give this as a reason than men (women, 172, 36.4% versus men, 29, 15.5%; $p<0.001$). Having no-one nearby to walk with, was the next most

frequent reason given, with a quarter (168, 25.4%) of people affirming this as a barrier to walking. This was the only other reason given where men and women's responses differed significantly from each other (women, 140, 29.6% versus men, 28, 14.9%; p<0.001). 'Problems with health' was the third most cited reason, with men somewhat more likely to give this as a reason (although not significantly so) than women (everyone: 129,19.7%; women: 83,17.8%; men: 46, 24.5%).

The overall number of different 'external' barriers to walking (items 2 to 9 inclusive in **table 18** ie. excluding 'health problems' and 'other reasons') that people named varied. Of the 670 (89%) people who had provided responses to any of these items, less than half (301,44.9%) indicated that there were no external factors which acted as barriers to walking around their neighbourhood, while 157 people (23.4%) named one and the remaining 212 people (31.6%) named 2 or more barriers. An exploratory (univariate logistic regression) analysis was conducted to see whether reporting any (versus no) external barriers to walking related to any particular demographic characteristics of the respondents (see **table 19**).

In this first analysis of the issue, a number of respondent characteristics appeared to be associated with reporting fewer external barriers to walking. For instance, while age did not appear to be of any relevance, women were significantly more likely than men to cite external barriers to walking (p=0.001). Married people (or those living as married) were significantly less likely than other people to report any external barriers (p<0.001) as were those who were highly educated (having a degree – by comparison with those having some or no qualifications p=0.03). Home ownership (rather than renting) significantly reduced the odds of reporting external barriers to walking (p=0.02), as did a person's position on the postcode-derived deprivation index (p=0.02) – although the nature of this association did not appear to be straightforward.

Because many of the demographic items examined in the univariate analysis were likely to be partially associated with (or confounded by) each other, a multivariate logistic regression analysis (simultaneous entry) was conducted (see **table 20**) which included all variables that had exhibited a p-value of <0.5. The analysis also adjusted for age. This analysis revealed that, following adjustment for other factors, only two characteristics remained significantly and independently associated with reporting external barriers to walking. These were, gender – with men nearly 40% less likely than women (that is, odds ratio of 0.62 compared with women taking referent value of 1.0; p=0.02) to report any external barriers to walking; and marital status – with those who were not currently married 88% more likely (ie approaching twice as likely) than married people (that is, odds ratio of 0.88 compared with married people taking referent value of 1.0; p=0.001) to report external barriers to walking. The amount of variance explained by this model was between 7.0% and 9.3% - leaving more than 90% unexplained.

We next examined whether there was any relationship between reporting any external barriers to walking and 1) peoples' overall levels of physical activity (excluding leisure walking), and 2) their previous led walk attendance. We found no association with the former (no./% reporting any external barriers to walking at baseline: within lowest tertile MET/hours 118, 54.4%, mid tertile 123, 54.9%, highest tertile 122, 55.5%; P=0.98); however, there was a highly significant correspondence with the latter ie. people who had attended a Health Walk were significantly less likely to report any external barriers to walking in their neighbourhood (no./% reporting any external barriers to walking at baseline: amongst those who had previously attended a led walk 289, 51.2%; amongst those who had not attended one 79, 76.7%; p<0.001).

We next examined whether naming any external barriers to walking (versus not), was related to any subsequent change in peoples' MET/hours of leisure walking.

Amongst those who returned 3 month follow-up questionnaires, people who had reported any external barriers to walking at baseline had increased their MET/hours leisure walking at 3 months significantly less than those who had reported no external barriers (baseline/ 271, 52.5% reporting barriers versus 245, 47.5% reporting no barriers: mean increase in walking at 3 months 9.35 MET/hours versus 15.89 MET/hours increase in walking at 3 months respectively; t=-2.83 p=0.005).

An equivalent analysis was conducted comparing people who cited any external barriers to walking at baseline with those who had not, regarding change in MET/hours of leisure walking that occurred between baseline and the 12 months follow-up. This showed that (based on the reduced number of people who returned questionnaires at baseline and again at 12 months) while both groups had increased their MET/hours of leisure walking between baseline and the 12 month follow-up, any difference in the amount of increase between the two groups that had been apparent at 3 months, had all but disappeared by 12 months (baseline/ 245, 51.9% reporting barriers, versus 227, 48.1% reporting no barriers: mean increase in walking at 12 months mean change 13.98 MET/hours versus mean change 14.67 MET/hours respectively increase in walking at 12 months; t=-0.25 p=0.81).

Finally, we examined whether reporting external barriers to walking was associated with peoples' subsequent Health Walks participation (see **table 21)**. People were compared regarding the number of Health Walks they had attended in the previous 3 months (0, 1-3, 4-11 or >11, as stated on their 3 month follow-up questionnaire), as well as in relation to the number of Health Walks they had attended in the previous 9 months (0, 1-17, 18-35 or >35, as stated on their 12 month follow-up questionnaire), according to whether they had reported any external barriers to walking at baseline. No significant differences was found between these groups in either case.

DISCUSSION

The WHI and PTH have the specific aim of encouraging sedentary adults to become more active, by attending Health Walks, and to enjoy numerous health benefits that accrue from this - particularly a likely reduction in the risk of cardiovascular disease. The initiatives aim to get more people walking within their own communities, especially those who take little exercise and/or who live in areas of poor health – essentially people who are in some sense disadvantaged.

This study therefore evaluated the WHI/PTH from four particular perspectives: 1) Where people were on the sedentary to active continuum when they first joined a local (new) scheme, 2) How their attitudes to walking and levels of walking and other physical activity changed during their participation, 3) Factors which encouraged, and barriers which deterred peoples' continued participation and adherence to led walks and 4) Factors which encouraged, and barriers which deterred them from continuing with walking outside the aegis of local schemes.

Our evaluation of newly funded led walk schemes achieved a large sample of 750 people that was broadly representative of newly funded WHI/PTH schemes in England and Scotland at the time of study recruitment and which obtained good response rates to 3 month (80%) and 12 month (74%) follow-up questionnaires. The baseline demographic characteristics of people who returned completed questionnaires at the follow-up stages did not differ significantly from those with whom contact was lost.

An initial observation concerning such schemes was that WHI/PTH schemes' identities, and the amount and methods of funding that they received could, in fact, take many different forms, particularly as a number of schemes throughout the country actually incorporated organised walks that were already in existence prior to the

WHI/PTH, and which were originally set up by individuals, groups of volunteers or City/County councils - with or without any funding provision (see Appendix I). Obviously while such newly funded schemes/walks aimed to attract new walkers, many of the walkers on the 'new' schemes were inevitably the same people who had taken part in organised walks, in the same area, under some kind of previous scheme. In other words, new schemes were quite likely to comprise a proportion of people who were already committed and, in some cases, enthusiastic walkers.

People who have been on led walks before, and who appreciate their value, are needed to create the momentum for getting new walking schemes up and running and to draw in newcomers. The ability of the WHI/PTH Health Walks schemes to attract such dedicated supporters, in large numbers and generally on a voluntary basis, is a measure of their success. The enormous amount of energy and enthusiasm that walk leaders put into setting up walks and advertising them locally (often by giving talks to other groups in their community) was witnessed by members of the research team, and found to be both remarkable and inspiring.

Overall, people were very willing to participate in the evaluation and details of the WHI/PTH Schemes from which the study population was recruited (see Appendix I) attest to the comprehensive degree of coverage (geographically and in terms of the variable size of schemes) that was achieved. The study population is therefore likely to have been highly representative of WHI/PTH participants nationally, at the time of study recruitment. This does not necessarily mean that they are representative of the general population, however. In order to appraise how representative participants' characteristics were in comparison with the general population, our results may be compared with results from the 2001 Census and related forms of National Statistics.[35]

Such comparisons reveal that, with no respondents under the age of 22 years, the age profile of the WHI/PTH participants, in this evaluation, was quite elderly with a mean age of 64 years. This was nearly twice the English (and Scottish) national average of 38 years[36] and more than half (56%) of the study population was, in fact, 65 or older. The average age and age distribution was similar for men and women (mean age: men 64.5; women 64.3). This finding also does not entirely reflect the profile of the national population – where women increasingly outnumber men above the age of 65, as death rates are greater among men than among women. While nearly three-quarters of the study respondents were female and women did indeed outnumber men, they did so in every age-group (by ~2:1), women were therefore relatively under-represented amongst WHI/PTH participants in the oldest age-group (75 and older). Around 70% of respondents described their employment status as 'retired' and clearly this finding is directly related to the older age structure of WHI/PTH participants.

Overall, approximately 95% of respondents reported their ethnic origin as white and the Scottish sub-group was significantly more likely to identify as white than the English participants (98% versus 94% respectively). This compares with the overall 2001 English Census figure of 87% who gave their ethnic origin as White British. However, this National figure presents a somewhat misleading picture, as non-white groups tend to be highly concentrated in specific parts of the country such as London (in the two London boroughs, Brent and Newham, the White group accounts for less than 50 per cent of the population). While the highest proportions describing themselves as White British are in the North East and the South West of England (each over 95 per cent). The relatively low proportion of non-white respondents also reflects the Schemes' age-profile, as people of non-white ethnicity, tend to be more highly represented in younger age-groups in the population as a whole. Overall therefore, at the time of the

study, WHI/PTH schemes appeared to be broadly representative of the population as a whole, in terms of the ethnicity of participants, given the relatively old age-profile.

Around one fifth of the sample was educated to degree level, although the Scottish sample was significantly more highly educated than their English counterparts, with 29% having a degree. Details of qualifications obtained by people representing the population as a whole are difficult to find, however, 16% of the British population of working age have been educated to degree level[37], compared with around 20% of the Scottish population[36], so, while there is much variation in this proportion from region to region, overall, WHI/PTH participants have a relatively more educated constituency.

As well as being relatively well educated, the study sample was also quite affluent, (particularly the Scottish sub-sample), with around 85% of people stating that they owned their home (higher in Scotland, at 88%). This compares with the 2003/04 General Household Survey (GHS) figure of 70% of dwellings being owner-occupied in Britain[38] and 63% in Scotland specifically[36]. However, once again, the high level of home ownership reflects the age profile of the study population as home ownership is highest among those above pensionable age.[38]

Another useful social indicator is car ownership. Households without access to a car are almost twice as likely to report facing difficulties in accessing at least one local service (eg. chemist, General Practitioner (GP), post office, main food shop, or local hospital), according to 2001 figures.[38] Only 21% of people in households with access to a car say that they experience difficulties accessing such services compared to 38% in households without a car. Use of the car is substantially greater in rural areas. More than 9 in 10 people living in rural areas use the car for their main food shopping and for travel to a hospital. This compares with little more than 7 in 10 adults in urban areas using a car for such services.[38] In the WHI/PTH evaluation, more than three-quarters of

the sample (~75% in England and ~80% in Scotland) reported having access to a car or van. This compares with the recent National figures where 73% of British households had access to a car[38]; 66% in Scotland[36]. Thus, the WHI/PTH study population was relatively affluent overall.

Regarding marital status, the study sample comprised a high proportion of people who were widowed (chiefly), divorced or separated (~38%) and thus likely to be living on their own. A further 7% of people described themselves as single (never married). Because widowhood is more common among women than among men at older ages, older women are more likely to live alone and the proportion increases with advancing age. The most recent GHS states that nearly half of women aged 65 and over are widowed and that this proportion rises to four fifths of those aged 85 and over[38].

In summary, the socio-demographic characteristics of WHI/PTH participants may be described as predominantly female, young-old and mainly retired. Relatively educated and affluent, fairly lacking in ethnic diversity but representative of Britain as a whole in this regard (given their older age profile), also representing a high proportion of people who live alone and who are at risk of being socially isolated. Most of these characteristics were, if anything, amplified within the Scottish sub-sample. Nevertheless, within the sample there was considerable variation.

In terms of general health status, more than 80% of the sample self-rated their health as 'excellent, very good or good' while 16% (~9% in Scotland) described their health as only 'fair/poor'. This was quite similar to ratings obtained in the most recent GHS.[38] However, the key message here is that WHI/PTH participants who felt that their health was not particularly good were nevertheless getting out and walking – despite their poor health status. Particularly relevant to the evaluation was the fact that one fifth (20%) of participants said that they had 'problems with health that prevent walking' and

7% of the sample were registered disabled. Around 38% reported having a problem that specifically affected their hip(s), knee(s) or feet. This latter figure is fairly similar to observations from a recent large scale survey of people limited to those aged 65 and older, living in Oxfordshire[39], in which 41% reported having a long-term problem involving hip or knee pain. In this respect also, therefore, the WHI/PTH population appeared to have characteristics that are generally associated with being young-old ie. age 65-75 years.

Where people were on the sedentary to active continuum when they first joined a local scheme.

Fifteen percent of the study population were attending a led Health Walk for the very first time. An important finding was that individuals who were completely new to led Health Walks schemes were significantly more likely to represent disadvantaged groups (non-white, less qualified, occupying a worse position on the deprivation index, and registered disabled) than was the case for other walkers. Some apparent differences between the English and Scottish sub-groups of people who were attending a led walk for the first time were observed; however, a larger sample of Scottish participants would have been required to test whether these apparent differences were likely to be 'real', rather than representing a chance finding from an unrepresentative small sub-sample. Overall therefore, the schemes were going some way towards achieving their stated aims of attracting new, relatively disadvantaged people.

One other point of note here is that an extraordinarily high proportion of people attending led walks had been ill for a whole week (~24%), bereaved (~12%) or had had an operation (~9%) within the previous 12 months. Those who were new to led walks contained an even higher (significantly in the case of operations) proportion of people

exposed to such events (been ill for a whole week ~27%; bereaved ~18%; or had had an operation ~15% within the previous 12 months). This highlights an important social support and rehabilitation role that Health Walks play for many people who are recovering from an event or crisis - be it physical, mental or social - and such events become increasingly likely to occur as people age.

Physical activities data were obtained by collating a detailed 7-day inventory of individual types of activities, completed within the questionnaire. This standard measure was adapted (to include work-related as well as leisure-based activities) from an American questionnaire (the Minnesota Leisure Time Physical Activity Questionnaire[30]) that has been assessed for its reliability[40] and validity[41], and found to be satisfactory. The measurement of physical activity by questionnaire is nevertheless an approximate measure. It is also likely that some individuals are inclined to exaggerate - or 'round up' - the amount of physical activity that they report, while others will tend towards the opposite direction. For this reason, measures of change over time (which requires obtaining repeated measures) are more useful than absolute measures taken at one point in time only, because measures of change take account of (cancel out) individuals' propensities to play up – or down – their activity levels.

All physical activities data were highly skewed, with a small number of people reporting very high levels of activity. Differences were apparent between men and women in terms of the types of physical activities that they engaged in the most, with women significantly more likely than men to engage in housework but with the situation reversed for DIY types of activity. In terms of total energy expenditure, men were significantly more physically active than women. These particular findings are not new.

For the reasons stated above, many people who attended newly funded WHI/PTH schemes had already participated in other led walks, and could, in some

cases, be described as walking enthusiasts (or certainly enthusiasts of these schemes). This helps to explain why the (median) average amounts of walking that were reported by people, at baseline (representing the previous week), were well above the recommended level (for overall physical activity) of 2½ hours per week equivalent to walking at, at least, moderate intensity (or 3^{+} METs).[24;25]

We should note here that one limitation of the study was that it was possible that a small proportion of respondents included the led walk that they had just attended in their physical activity inventory for the previous 7 days (despite receiving instructions about how to complete the questionnaire). This would have had the effect of inflating their reported level of walking in the week supposedly *prior* to attending the led walk. Nevertheless, even if this had occurred in some cases, this should not have pushed up their total 7 day physical activity levels by very much at all.

We examined whether any particular individual characteristics (such as age, gender, work status) were associated with walking at or above recommended levels. However, no specific demographic factors were shown to characterise such people and, following adjustment, only overall physical activity levels (excluding walking) remained significantly associated with walking at or above recommended levels of intensity. Thus people who were active walkers appeared to be people who were generally active in lots of other ways too.

'First-timers' (attending led walks) reported significantly lower levels of overall physical activity compared with other walkers (including sport activities), although their recent levels of leisure walking (at the recommended level of intensity to benefit health status) were fairly similar. Thus, newly funded schemes appeared to be attracting a small proportion of new people whose overall physical activity levels were lower than

was the case for previous attenders of led walks, but who made a similar effort to go walking.

Changes in attitudes to walking, levels of walking and other physical activity during study participation.

An analysis of physical activity levels across the whole period of the evaluation found that respondents actually slightly reduced their physical activity between baseline and 12 months follow-up; however, those who maintained their participation in WHI/PTH schemes reduced their physical activity less than those who stopped participating after 3 months. The finding that levels reduced, was not considered surprising, as Health Walks participants exhibited relatively high levels of physical activity at baseline (compared with those reported for the general population[25]), and therefore, some of the apparent reduction in physical activity levels could have represented the phenomenon 'regression to the mean' (see glossary) despite the fact that some attempt was made to adjust for this in the analysis[33]. In addition, when people know that they are being evaluated, it can have a positive effect on how they behave or report on their behaviour – at least initially (this phenomenon is referred to as the 'Hawthorne effect') so that – taking account of these likely influences - our interpretation of the results is that peoples' physical activity levels reduced slightly throughout the period of the evaluation, if anything, and certainly did not increase. The opportunity to go on led walks can nevertheless help people to remain physically active.

Our finding that physical activity levels did not increase beyond baseline levels does not, on the face of it, concur with findings reported from a randomised controlled trial that investigated the effects of lay-led walk participation on physical activity levels a few years ago[42]. However, that particular study only evaluated the effects of WHI

participation on a selected sample of people whose physical activity scores were below recommended levels at the start of the study. This was a very different situation from the current evaluation – in which a high proportion of led walk participants exhibited physical activity levels that were well above recommended levels from the start.

Our finding also might appear to be at odds with the fact that nearly three quarters of respondents said that they did more walking generally since being introduced to WHI/PTH schemes. While the likelihood is that such reporting was influenced by the aforementioned 'Hawthorne affect', these accounts - if correct - remain problematic because (- given that 85% of baseline participants had been on a led walk before -) we cannot know for certain which particular walking schemes or over what time periods people were referring to. It nevertheless remains possible that any such changes to walking behaviour could indeed have occurred, but that this was sometime before the date when people participated in this study.

An additional finding was that respondents who completed 3 month or 12 month follow-up questionnaires exhibited significantly higher overall levels of baseline physical activity than those who did not. This could have meant that people who were highly motivated to be physically active were simply 'highly motivated people', and that this affected other forms of behaviour also – such as completing questionnaires and walking to the post-box. Equally the finding could have indicated that people who were unable to exercise within a period of the evaluation, for some reason – such as ill health – were also (for the same reason) unable to complete a questionnaire.

Led walk attendance and retention was generally found to be extremely impressive, so that 3 months into the evaluation a considerable proportion (42%) had been attending led walks at least once a week, on average. By 12 months into the evaluation, somewhere approaching three-quarters (72%) of respondents had been on

led walks, averaging out to at least once a fortnight, and the same proportion of people said that they did more walking generally since being introduced to a WHI/PTH scheme.

Further analyses revealed that peoples' overall physical activity levels at 12 months had increased in line with the number of led walks that they had participated in during the preceding 9 months. The analysis had adjusted for many factors (including the fact that some data were missing due to 12 month non-response) that could reasonably have undermined this finding, but it remained highly significant (P=0.008). While participants reduced their level of physical activity between baseline and 12 month follow-up, those who maintained their participation in led walks reduced their physical activity less than those who stopped participating in led walks after month 3.

The finding that amongst those who completed follow-up questionnaires, a very high proportion of people continued with their attendance of WHI/PTH schemes is a positive one. However, follow-up questionnaire respondents were likely to represent the most enthusiastic (and fittest) people in a general sense. Nevertheless, even if we made an extremely pessimistic assumption that all non-respondents to questionnaires at 12 months had in fact dropped out from attending WHI/PTH schemes, this would still have left 50% (378/750) of the original baseline 750 study participants attending health walks at least once a fortnight 12 months later. Thus WHI/PTH schemes have an impressive retention rate which compares very favourably against the figure of 60% of people still paying membership fees to health fitness clubs 2 years after they first join (based on unpublished data from Melvyn Hillsdon).

Some of our evaluation was based upon qualitative data, using free text comments that people were invited to make on their questionnaires. Amongst people who said that they had increased their walking since joining Health Walks schemes, around 30% of examples of such extra walking that people provided stated that this

consisted mainly – or entirely in many cases – of led Health Walks or other forms of group walking, thus underlining the importance of these schemes in maintaining peoples' physical activity levels. However, a substantial proportion of the other examples of the extra walking that people did represented examples of independent walking, such as walking more often to shops (instead of taking the car) or walking around the local neighbourhood.

Factors which encourage, and barriers which deter continued participation and adherence to walking schemes (led walks).

At baseline, most of the walkers (52%) were attending walks described as 'flat/easy' or 'first steps' when the weather was described as 'good' (65% of walkers) and three quarters of walkers were recruited during the months of June through November. This last detail might suggest that more walks were held during Summer or Autumn months, or alternatively that larger numbers of people attended walks during these months – encouraged by better weather conditions. Clearly the weather - and hours of daylight - will influence many peoples' readiness to walk outside. Nevertheless, this was only likely to be of marginal influence - as judged by the high number of walks attended during the 12 month period of the evaluation, (70% had attended at least one per fortnight – a third having attended at least one per week - during the preceding 9 months).

More evidence that people were not just 'fair weather walkers' came from the very large number of comments that was received concerning the benefits that people enjoyed directly from their Health Walks participation, which included some specific mention of the Winter months. Chief amongst such benefits (cited by at least a quarter of people who provided any comments) was the social aspects associated with taking part.

Meeting people, making new friends, having someone to walk with and talk to, were all vital elements of the 'Health Walks experience' that were highly valued. This was likely increased by the large number of Health Walks that finished up at some kind of social 'watering hole' – such as a café. The emphasis that people placed on the associated social aspects of Health Walks participation is very understandable - given the high proportion of people amongst participants who were widowed, divorced, single, or recently bereaved. However an equally high proportion of comments (often from the same people) emphasised their sense of increased fitness and energy levels since taking part in the WHI/PTH.

Other comments frequently told of improvements experienced in relation to specific health problems – including mobility problems – that had occurred as a result of participation. A combination of feeling healthier (and more 'alive') with also feeling increasingly socially connected - amongst those prone to be otherwise quite socially isolated - were the key themes that people emphasised in relation to their (continued) participation in WHI/PTH schemes.

Factors which encourage, and the barriers which deter people from continuing with walking outside the aegis of local schemes.

Factors that deterred people from walking in contexts other than within WHI/PTH led walk contexts were, in many cases, the reverse of those that encouraged continued participation in those schemes. Thus many people cited factors that discouraged them from walking around their neighbourhood that were chiefly to do with being alone - which made them feel vulnerable. In particular, approximately one third of people (31% overall, 36% of females) said that they worried about their personal safety in terms of 'being attacked'. These findings are similar to those reported from another recent study[43] that

highlighted safety concerns amongst women in relation to independent walking. However, other aspects of personal safety, such as the risk of tripping over broken paving stones (18%) or being knocked down by a cyclist riding on the pavement (11%) added to the overall sense of threat in relation to independent walking. A key problem for many people (25%) - especially for women (30%) - concerned the lack of anyone who lived nearby with whom they could go walking. Being deterred from walking locally by any of these 'external factors' was particularly experienced – and significantly so - by women and people who were not married or cohabiting (ie. those who generally lived alone). People in the most deprived areas (based on the deprivation index) were also significantly more likely than other people to experience external barriers to walking locally, which could well have been heightened by poor environmental factors – including high crime rates. In addition to these factors, a fifth (~20%) of people cited health problems as a key factor that hampered or deterred them from walking around their neighbourhood.

The fact that WHI/PTH led walks attract mostly women, in the older age-groups, many of whom live alone, is highly appropriate, as these are the very people who - without the social support, protection and encouragement of a group – could, in some cases, otherwise find it difficult to walk regularly.

Thus, for the majority of led walk participants, maintaining current levels of physical activity – rather than increasing these levels – could be viewed as the Health Walks Schemes' most vital function, as it is unclear how many of the participants of these schemes would feel safe and supported enough to go walking at all outside the context of organised walking groups. Also, given that the most participants attended walks that were classed as 'easy' 'flat' or 'first steps', and many of the participants had health problems, the kinds of walks that are arranged by other walking associations (eg.

Ramblers clubs) would likely be too demanding or intimidating for many of the people who attend Health walks schemes.

While new people are recruited by WHI/PTH schemes, it takes a while for new schemes to attract them and the participation of highly motivated volunteers – as well as paid organisers – clearly helps to maintain or raise their profile within communities. While 18% of people had first heard about these schemes from a primary care source, (posters/leaflets in the local health centre or direct recommendation from GP or other health care worker), it is possible that some GPs remain unaware of their existence but would find them useful, as they have the potential to represent a low risk and enjoyable method of rehabilitating people with low physical activity levels.

CONCLUSIONS

While new people are recruited by WHI/PTH led walks, it takes a while for new schemes to attract such people. Instead, new WHI/PTH schemes initially tend to attract a high proportion of people who have attended led walks before. While new recruits to such schemes represent only a small proportion of participants overall, they are nevertheless significantly more socially disadvantaged than other walkers.

A high proportion of participants are nevertheless disadvantaged in other important ways – chiefly in terms of a 'block-booking' of being older, female and, often, alone. Many also have health problems. This combination of factors is a potent mix that risks social isolation and worsening health status.

For many Health Walk participants, the main and most vital functions that WHI/PTH schemes offer are twofold: the maintenance of current levels of physical activity combined with an increased opportunity for regular social contact. In the absence of opportunities for walking in groups, or on led walks specifically, it is unclear how many of the participants would otherwise feel safe and supported enough to go walking at all and many could be at risk of becoming quite socially isolated.

WHI/PTH schemes are clearly an incredibly valuable resource. It seems an obvious point that primary care professionals should know about these schemes, as they have the potential to represent a low risk and enjoyable method of rehabilitating people with low physical activity levels.

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Figures and Tables

Figure 1. Flow chart showing study recruitment and response rate (questionnaires returned) at follow-up stages.

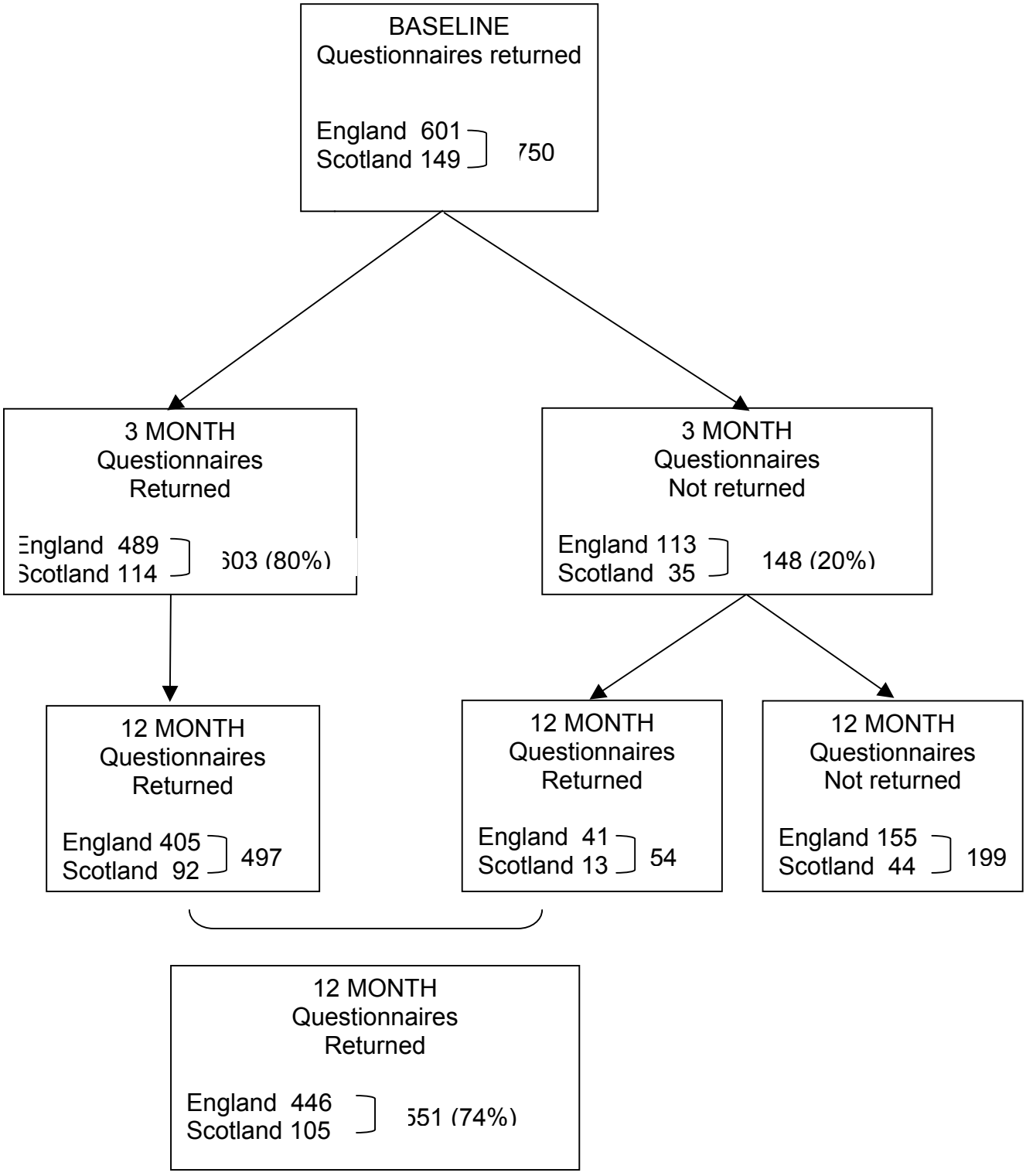
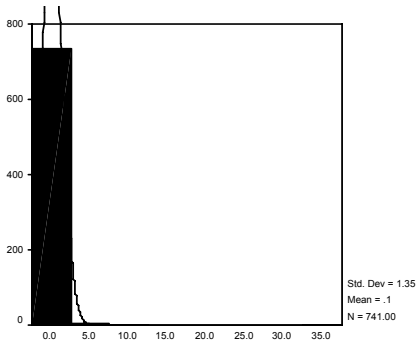
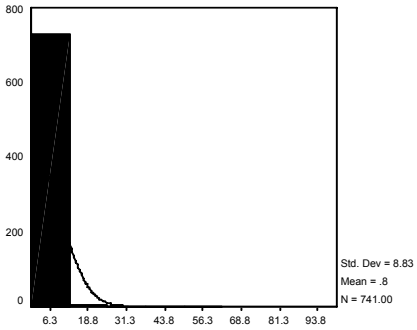


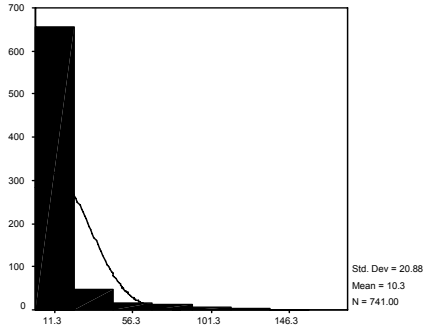
Figure 2. Histograms demonstrating the skewed nature of physical activities data represented by MET/hours per activity in the previous week*.



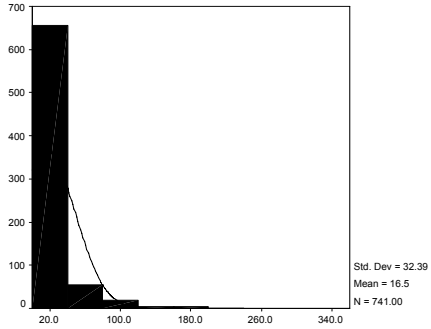
Cycling to work



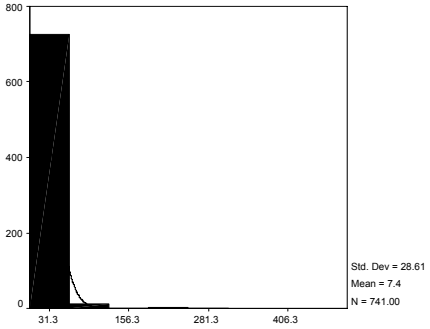
Walking to work



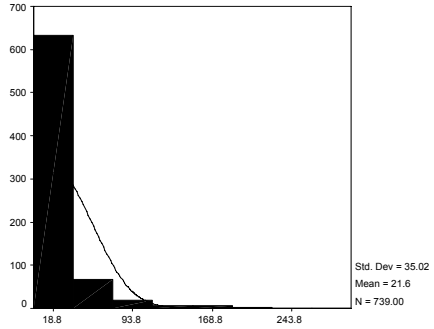
Home activities



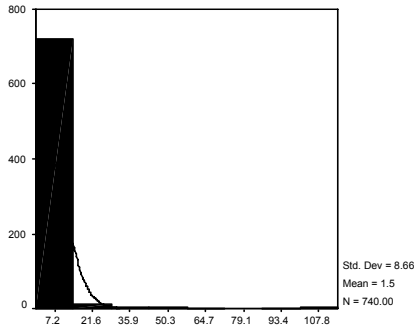
Gardening activities



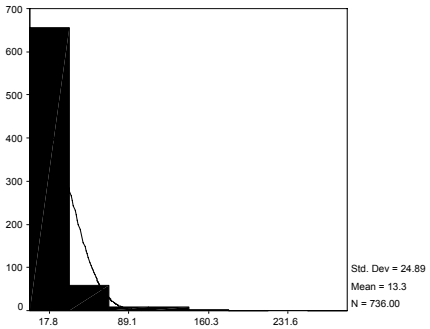
DIY activities



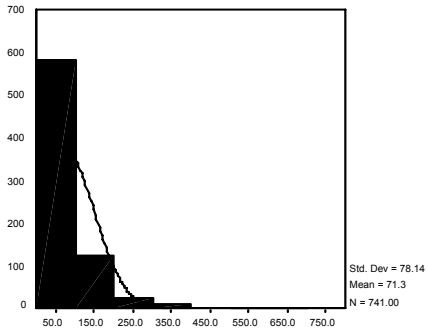
Walking activities



Leisure cycling



Sport activities



Total MET/hours

*nb. Values represented by each histogram are displayed on different scales due to the variability in peoples' activity levels between different activities.

Table 1. Walk characteristics in relation to participants and comparing English and Scottish sub-samples.

Characteristic		All (N=750[1]) No.	(%)	English respondents (N=601[1]) No.	(%)	Scottish respondents (N=149[1]) No.	(%)
Distance walked by participants (miles)	Less than 1	39	(5.2)	30	(5.0)	9	(6.0)
	1 and over but less than 2	304	(40.5)	279	(46.4)	25	(16.8)
	2 and over but less than 3	205	(27.3)	132	(22.0)	73	(49.0)
	3 and over but less than 4	132	(17.6)	121	(20.1)	11	(7.4)
	4 and over but less than 5	41	(5.5)	20	(3.3)	21	(14.1)
	5 and over	29	(3.9)	19	(3.2)	10	(6.7)
Difficulty of walk	First steps	24	(3.2)	24	(4.0)	0	(0.0)
	Flat, easy	371	(49.5)	335	(55.7)	36	(24.2)
	Slight hill/moderate pace	296	(39.5)	208	(34.6)	88	(59.1)
Weather on day of walk[2]	Good (warm and/or sunny)	490	(65.3)	433	(72.0)	57	(38.3)
	Fair (dry but dull cold or windy)	147	(19.6)	100	(16.6)	47	(31.5)
	Unpleasant (wet or extremely cold/windy/snow)	64	(8.5)	44	(7.3)	20	(13.4)
Season walk held in	Spring (Mar-May)	135	(18.0)	93	(15.5)	42	(28.2)
	Summer (Jun-Aug)	255	(34.0)	255	(42.4)	0	(0.0)
	Autumn (Sep-Nov)	312	(41.6)	214	(35.6)	98	(65.8)
	Winter (Dec-Feb)	48	(6.4)	39	(6.5)	9	(6.0)
Refreshments at end of walk		464	(61.9)	393	(65.4)	71	(47.7)

[1]The table shows column percentages. The 'n' varies with each variable due to a small number of missing responses on questionnaires.
[2]All information related to the weather only applies to the walks visited by the study researcher (n=701),who provided the ratings, and does not reflect the total number of walks held in any particular season.

Table 2. Baseline characteristics of participants including comparison between English and Scottish sub-groups.

Characteristic		All (N=750*)		England (N=601*)		Scotland (N=149*)		P=
		No.	(%)	No.	(%)	No.	(%)	
Demographic								
Sex	Female	544	(72.5)	428	(71.2)	116	(77.9)	0.062
Age group:	Under 65	323	(43.1)	258	(43.4)	65	(43.6)	0.295
	65-74	323	(43.1)	253	(42.6)	70	(47.0)	
	75+	97	(13.1)	83	(14.0)	14	(9.4)	
Ethnic origin:	White	710	(95.3)	564	(93.8)	146	(98.0)	0.042
	Other	40	(5.3)	37	(6.2)	3	(2.0)	
Marital status:	Married/living as married	404	(54.9)	324	(54.9)	80	(54.8)	0.735
	Widowed/divorced/separated	276	(37.5)	219	(37.1)	57	(39.0)	
	Single (never married)	56	(7.6)	47	(8.0)	9	(6.2)	
Education:	Degree or equivalent	156	(22.1)	115	(20.4)	41	(29.1)	<0.001
	Some qualifications	257	(36.5)	191	(33.9)	66	(46.8)	
	No qualifications	292	(41.4)	258	(45.7)	34	(24.1)	
Employment status:	Full time (30+ hrs)	40	(5.4)	37	(6.2)	3	(2.0)	0.027
	Part time	110	(14.8)	85	(14.3)	25	(16.9)	
	Retired	524	(70.3)	416	(69.7)	108	(73.0)	
	Other	71	(9.6)	59	(9.9)	12	(8.2)	
Accommodation:	Own home	617	(84.6)	490	(83.8)	127	(88.2)	0.200
	Rented	112	(15.4)	95	(16.2)	17	(11.8)	
Use of car or van		550	(76.1)	437	(75.2)	113	(79.6)	0.278
Health-related								
General health status:	Excellent/very good	318	(43.1)	233	(39.5)	85	(57.9)	<0.001
	Good	303	(41.1)	254	(43.0)	49	(33.3)	
	Fair/poor	117	(15.9)	104	(17.6)	13	(8.9)	
Hip, knee or feet problem		273	(37.5)	224	(38.4)	49	(34.0)	0.387
Ill for whole week in last 12 months		179	(24.3)	146	(24.7)	33	(22.8)	0.667
Bereaved in last 12 months		89	(12.4)	77	(13.4)	12	(8.4)	0.119
Had operation in last 12 months		66	(9.1)	54	(9.2)	12	(8.3)	0.871
Registered disabled		51	(7.0)	44	(7.5)	7	(4.9)	0.360
Smoking:	Regular smoker[+]	31	(4.2)	24	(4.1)	7	(4.8)	0.892
	Ex smoker	232	(31.7)	185	(31.5)	47	(32.4)	
	Non smoker	469	(64.1)	378	(64.4)	91	(62.8)	
Barrier to walking:	'Problems with health that prevent walking'	129	(19.7)	107	(20.6)	22	(16.3)	0.331

*The n varies with each variable (to a small extent) due to some missing responses to individual questions
[+](at least one cigarette a day)

Table 3. Respondent characteristics comparing baseline, 3 month and 12 month follow-up samples.

Characteristic		Baseline sample n=750 No	(%)	3 month follow-up n=603* No	(%)	12 month follow-up n=551* No	(%)
Country	England	601	(80.1)	488	(81.1)	446	(80.9)
Sex	Female	544	(72.5)	430	(71.4)	397	(72.1)
Age group	Under 65	323	(43.1)	249	(41.7)	233	(42.4)
	65-74	323	(43.1)	264	(44.2)	237	(43.2)
	75+	97	(13.9)	84	(14.1)	79	(14.4)
Ethnic origin	White	710	(95.3)	571	(95.6)	522	(95.6)
	Black African	6	(0.8)	5	(0.8)	5	(0.9)
	Black Caribbean	10	(1.3)	6	(1.0)	5	(0.9)
	Asian(Indian/Pakistani/Bangladeshi)	10	(1.3)	8	(1.3)	6	(1.1)
	Other ethnic origin	9	(1.2)	7	(1.2)	8	(1.5)
Marital status	Single (never married)	56	(7.6)	39	(6.6)	39	(7.2)
	Married/living as married	404	(54.9)	328	(55.4)	301	(55.5)
	Widowed/Divorced/ Separated	276	(37.5)	225	(38.0)	202	(37.3)
Education	Degree or equivalent	156	(22.1)	134	(23.5)	117	(22.4)
	A Level or equivalent	87	(12.3)	70	(12.3)	62	(11.9)
	GCSE, O Level, School Cert. or equivalent	170	(24.1)	140	(24.5)	127	(24.3)
	No qualifications	292	(41.4)	227	(39.8)	216	(41.4)
Employment status	Full time (30+ hrs)	40	(5.4)	31	(5.2)	25	(4.6)
	Part time	110	(14.8)	91	(15.2)	89	(16.2)
	Retired	524	(70.3)	429	(71.6)	387	(70.5)
	Other	71	(9.6)	48	(8.0)	48	(8.7)
Accommodation	Own home (including mortgage)	617	(84.6)	503	(85.7)	461	(86.0)
	Rented	112	(15.4)	84	(14.3)	75	(14.0)
Deprivation index	Most affluent - quintile 1	148	(20.1)	120	(20.2)	113	(20.7)
	quintile 2	148	(20.1)	126	(21.2)	110	(20.2)
	quintile 3	147	(19.9)	117	(19.7)	112	(20.6)
	quintile 4	148	(21.1)	118	(19.9)	106	(19.4)
	Most deprived - quintile 5	146	(19.8)	113	(19.0)	104	(19.1)

*Note that the denominator varies with each variable (to a small extent) due to variable numbers of missing responses to individual questionnaire items

Table 4. Characteristics of people attending a led walk for the first time, compared with other walkers.

Characteristic		All (N=750*) No.	(%)	First time walkers (N=114*) No.	(%)	Other walkers (N=631*) No.	(%)	P=
Demographic								
Country:	England	597	(80.1)	97	(87.1)	500	(79.2)	0.162
Sex:	Female	544	(72.5)	88	(77.2)	453	(71.8)	0.255
Age group:	Under 65	323	(43.1)	48	(43.2)	274	(43.7)	
	65-74	323	(43.1)	43	(38.7)	276	(44.0)	0.226
	75+	104	(13.9)	20	(18.0)	77	(12.3)	
Ethnic origin:	White	710	(95.3)	101	(88.6)	605	(96.6)	<0.001
	Other	36	(4.6)	13	(11.4)	21	(3.4)	
Marital status:	Married/living as married	404	(54.9)	59	(52.7)	342	(55.3)	0.594
	Widowed/divorced/separated	276	(37.5)	42	(37.5)	233	(37.6)	
	Single (never married)	56	(7.6)	11	(9.8)	44	(7.1)	
Education:	Degree or equivalent	156	(22.1)	18	(16.7)	138	(23.2)	0.005
	Some qualifications	257	(36.4)	30	(27.8)	225	(37.9)	
	No qualifications	292	(41.4)	60	(55.6)	231	(38.9)	
Employment status:	Full time (30+ hrs)	40	(5.4)	8	(7.1)	32	(5.1)	0.096
	Part time	110	(14.8)	18	(15.9)	90	(14.4)	
	Retired	524	(70.3)	70	(61.9)	451	(71.9)	
	Other	71	(9.6)	17	(15.0)	54	(8.6)	
Accommodation:	Own home	617	(84.6)	80	(72.1)	534	(87.0)	<0.001
	Rented	112	(15.4)	31	(27.9)	80	(13.0)	
Deprivation index:	Most affluent - quintile 1	147	(20.1)	14	(12.6)	133	(21.4)	0.026[$]
	quintile 2	147	(20.1)	25	(22.5)	122	(19.6)	
	quintile 3	147	(20.1)	20	(18.0)	127	(20.5)	
	quintile 4	145	(19.8)	21	(18.9)	124	(20.0)	
	Most deprived - quintile 5	146	(19.9)	31	(27.9)	115	(18.5)	
Health-related								
General health status	Excellent/very good	318	(43.1)	44	(38.6)	272	(43.9)	
	Good	303	(41.1)	48	(42.1)	253	(40.9)	0.427
	Fair/poor	117	(15.9)	22	(19.3)	94	(15.2)	
Hip, knee or feet problem		273	(37.5)	47	(42.0)	224	(36.7)	0.287
Ill for whole week (in last 12 months)		179	(24.3)	30	(26.5)	149	(24.1)	0.579
Bereaved (in last 12 months)		89	(12.4)	19	(17.8)	70	(11.6)	0.081
Had operation (in last 12 months)		66	(9.1)	17	(15.3)	49	(8.0)	0.019
Registered disabled		51	(7.0)	18	(16.2)	32	(5.2)	<0.001
Smoking:	Regular smoker[+]	31	(4.2)	7	(6.3)	23	(3.7)	0.337
	Ex smoker	232	(31.7)	31	(27.9)	200	(32.5)	
	Non smoker	469	(64.1)	73	(65.8)	393	(63.8)	
Barrier to walking:	'Problems with health that prevent walking'	129	(19.7)	27	(27.8)	102	(18.3)	0.038

*While the total sample is n=750, information was provided by 745 regarding whether this was the first time they had attended a led walk or not. The denominator also varies with each variable (to a small extent) due to variable numbers of missing responses to other questionnaire items.
[+]Regular was defined as at least one cigarette per day.
[$] X^2 *trend*

Table 5. Characteristics of participants attending a led walk for the first time comparing English and Scottish sub-groups.

Characteristic		ALL N=114*		English N=97*		Scottish N=17*	
		No.	(%)	No.	(%)	No.	(%)
Demographic							
Sex	Female	88	(77.2)	74	(76.3)	14	(82.4)
Age group:	Under 65	48	(42.1)	42	(43.3)	6	(35.3)
	65-74	43	(37.7)	34	(35.1)	9	(52.9)
	75+	23	(20.2)	21	(21.6)	2	(11.8)
Ethnic origin:	White	101	(88.6)	84	(86.6)	17	(100.0)
	Other	13	(11.5)	13	(13.5)	0	(0.0)
Marital status:	Married/living as married	59	(52.7)	48	(49.5)	11	(73.3)
	Widowed/divorced/separated	42	(37.5)	38	(39.2)	4	(26.7)
	Single (never married)	11	(9.8)	11	(11.3)	0	(0.0)
Education:	Degree or equivalent	18	(16.7)	15	(16.3)	3	(18.8)
	Some qualifications	30	(27.8)	24	(26.1)	6	(37.5)
	No qualifications	60	(55.6)	53	(57.6)	7	(43.8)
Employment status:	Full time (30+ hrs)	8	(7.1)	8	(8.3)	0	(0.0)
	Part time	18	(15.9)	15	(15.7)	3	(17.7)
	Retired	70	(61.9)	57	(59.4)	13	(76.5)
	Other	17	(15.0)	16	(16.7)	1	(5.9)
Accommodation:	Own home (outright/mortgage)	80	(72.1)	66	(69.5)	14	(87.5)
Deprivation index:	Most affluent - quintile 1	14	(12.6)	13	(13.8)	1	(5.9)
	quintile 2	25	(22.5)	20	(21.3)	5	(29.4)
	quintile 3	20	(18.0)	19	(20.2)	1	(5.9)
	quintile 4	21	(18.9)	15	(16.0)	6	(35.3)
	Most deprived - quintile 5	31	(27.9)	27	(28.7)	4	(23.5)
Health-related							
General health status:	Excellent/very good	44	(38.6)	32	(33.0)	12	(70.6)
	Good	48	(42.1)	46	(47.4)	2	(11.8)
	Fair/poor	22	(19.3)	19	(19.6)	3	(17.6)
Current hip, knee or foot problem		47	(42.0)	38	(40.0)	9	(52.9)
Events during last 12 months:							
	Ill for a whole week	30	(26.5)	28	(29.2)	2	(11.8)
	Bereaved	19	(17.8)	16	(17.8)	3	(17.6)
	Had an operation	17	(15.3)	15	(15.8)	2	(12.5)
Registered disabled		18	(16.2)	18	(18.9)	0	(0.0)
Smoking:	Regular smoker[+]	7	(6.3)	7	(7.4)	0	(0.0)
	Ex smoker	31	(27.9)	26	(27.7)	5	(29.4)
	Non smoker	73	(65.8)	61	(64.9)	12	(70.6)
Stated 'barrier to walking':	'Problems with health that prevent walking'	27	(27.8)	23	(28.0)	4	(26.7)

*The n varies with each variable (to a small extent) due to some missing responses on questionnaires
[+]Regular defined as at least one cigarette per day.

Table 6. Baseline physical activity levels: MET/hours per week for various activities, presented separately for men and women.

Sex		Cycle to work	Walk to work	Home activities	Gardening activities	DIY	Leisure walking[1]	Leisure cycling	Sport activities	Total
Females	N	539	539	539	539	539	537	538	535	539
	Mean	0.12	0.74	12.04	15.73	5.68	21.93	0.77	12.65	69.48
	SD	1.59	9.89	22.85	33.45	28.83	38.46	4.67	23.00	82.59
	Median	0.00	0.00	4.50	5.00	0.00	10.50	0.00	4.00	46.00
Males	N	202	202	202	202	202	202	202	201	202
	Mean	0.00	0.79	5.34	18.40	12.15	20.69	3.54	14.95	75.98
	SD	0.00	5.05	13.30	29.37	27.54	23.60	14.56	29.32	64.74
	Median	0.00	0.00	0.00	6.67	3.25	12.25	0.00	4.50	61.67
Total	N	741	741	741	741	741	739	740	736	741
	Mean	0.08	0.75	10.27	16.46	7.45	21.59	1.53	13.28	71.26
	SD	1.35	8.83	20.88	32.39	28.61	35.02	8.66	24.89	78.14
	Median	0.00	0.00	3.00	5.67	0.00	11.00	0.00	4.04	49.42

[1]Leisure walking only includes walking at an intensity of 3 METs or more (ie. excludes 'slow' walking)

Non-parametric test of significance (Mann-Whitney U) comparing men and women:

Cycle to work	Z= -1.51 p=0.13
Walk to work	Z= -0.96 p=0.34
Home activities	Z= -7.36 p<0.001
Gardening activities	Z= -1.64 p=0.10
DIY	Z= -8.34 p<0.001
Leisure walking	Z= -1.60 p=0.12
Leisure cycling	Z= -3.70 p<0.001
Sport activities	Z= -0.50 p=0.62
Total MET/hours	Z= -2.63 p=0.009

Table 7. Baseline physical activity levels in previous week comparing people who had not been on a led walk before ('first-timers') with all other walkers: MET/hours per week for various activities, presented separately for men and women.

Sex		Cycle to work	Walk to work	Home activities	Gardening activities	DIY	Leisure walking	Leisure cycling	Sport activities	Total
FIRST-TIMERS (n=110)										
Females	N	85	85	85	85	85	85	85	85	85
	Mean	0.12	0.30	14.39	14.10	13.75	15.38	0.14	8.33	66.51
	SD	1.08	1.40	21.54	24.54	64.75	17.38	1.30	18.02	91.32
	Median	0.00	0.00	5.25	3.33	0.00	10.50	0.00	0.00	35.00
Males	N	25	25	25	25	25	25	25	25	25
	Mean	0.00	1.28	6.60	7.67	22.62	22.38	0.16	6.24	66.94
	SD	0.00	6.00	15.92	14.85	58.83	32.95	0.80	8.41	71.32
	Median	0.00	0.00	0.00	1.67	1.50	10.83	0.00	4.08	34.17
Total	N	110	110	110	110	110	110	110	110	110
	Mean	0.09	0.52	12.62	12.64	15.77	16.97	0.15	7.85	66.61
	SD	0.95	3.10	20.60	22.80	63.30	21.92	1.20	16.33	86.87
	Median	0.00	0.00	4.50	3.17	0.00	10.50	0.00	0.00	34.58
ALL OTHER WALKERS (n=626)										
Females	N	451	451	451	451	451	449	450	447	451
	Mean	0.12	0.34	11.43	16.14	4.20	22.78	0.89	13.42	69.10
	SD	1.67	2.57	22.76	34.97	14.02	40.41	5.06	23.70	78.34
	Median	0.00	0.00	4.00	5.75	0.00	10.50	0.00	6.00	47.83
Males	N	175	175	175	175	175	175	175	174	175
	Mean	0.00	0.73	5.43	19.77	10.12	20.49	4.06	16.38	76.88
	SD	0.00	4.94	13.00	30.73	18.05	22.20	15.58	31.12	63.99
	Median	0.00	0.00	0.00	8.00	3.75	13.00	0.00	4.67	63.00
Total	N	626	626	626	626	626	624	625	621	626
	Mean	0.08	0.44	9.75	17.16	5.86	22.14	1.78	14.25	71.27
	SD	1.42	3.40	20.67	33.86	15.47	36.24	9.39	26.00	74.64
	Median	0.00	0.00	3.00	6.50	0.00	11.00	0.00	5.00	51.00

Non-parametric test of significance (Mann-Whitney U) comparing 'first-timers' with all other walkers

ALL:		**FEMALES ONLY:**		**MALES ONLY:**	
Cycle to work	Z= -0.12 p=0.90	Cycle to work	Z= -0.06 p=0.95	Cycle to work	Z= -0.00 p=1.00
Walk to work	Z= -1.42 p=0.16	Walk to work	Z= -1.46 p=0.14	Walk to work	Z= -0.47 p=0.64
Home activities	Z= -2.28 p=0.023	Home activities	Z= -2.34 p=0.019	Home activities	Z= -0.08 p=0.94
Gardening activities	Z= -2.45 p=0.014	Gardening activities	Z= -1.21 p=0.23	Gardening activities	Z= -2.76 p=0.006
DIY	Z= -1.37 p=0.17	DIY	Z= -0.75 p=0.45	DIY	Z= -0.71 p=0.48
Leisure walking	Z= -1.45 p=0.15	Leisure walking	Z= -1.06 p=0.29	Leisure walking	Z= -0.96 p=0.34
Leisure cycling	Z= -2.19 p=0.028	Leisure cycling	Z= -1.61 p=0.12	Leisure cycling	Z= -1.38 p=0.17
Sport activities	Z= -3.20 p=0.001	Sport activities	Z= -3.09 p=0.002	Sport activities	Z= -0.99 p=0.32
Total MET/hours	Z= -2.46 p=0.014	Total MET/hours	Z= -1.81 p=0.07	Total MET/hours	Z= -1.52 p=0.13

Table 8. Baseline respondent characteristics associated with walking for leisure at or above recommended levels for physical activity (equivalent to ≥ 2.5 hours per week at ≥3 METs' intensity) in the previous week, compared with walking less (univariate analysis).

Variable (n)	Total hours of walking per week				Odds ratio	95% CI	χ^2 (df)	p-value
	≥ 2.5 hrs/wk n=484		<2.5 hrs/wk n=257					
	n	%	n	%				
Age group (n=734)								
< 65 years	206	(64.4)	114	(35.6)	1.00	referent		
65-70 years	215	(67.6)	103	(32.4)	1.16	0.83 - 1.60		
75+ years	58	(60.4)	38	(39.6)	0.85	0.53 - 1.35	1.88 (2)	0.39
Gender (n=741)								
Female	344	(63.8)	195	(36.2)	1.00	referent		
Male	140	(69.3)	62	(30.7)	1.28	0.91 - 1.81	1.95 (1)	0.16
Ethnicity (n=736)								
White	458	(65.3)	243	(34.7)	1.00	referent		
Other	22	(62.9)	13	(37.1)	0.90	0.45 - 1.81	0.09 (1)	0.76
Marital status (n=741)								
Single	36	(65.5)	19	(34.5)	1.00	referent		
Married/cohabiting	268	(66.8)	133	(33.2)	1.06	0.59 - 1.93		
Widowed/divorced/separated	174	(64.2)	87	(35.8)	0.95	0.52 - 1.74	0.50 (2)	0.78
Education (n=697)								
Degree	95	(60.9)	61	(39.1)	1.00	referent		
Some qualifications	174	(68.5)	80	(31.5)	1.40	0.92 - 2.12		
No qualifications	188	(65.5)	99	(34.5)	1.22	0.82 - 1.83	2.48 (2)	0.29
Work status (n=736)								
Full time	22	(55.0)	18	(45.0)	1.00	referent		
Part time	76	(69.1)	34	(30.9)	1.83	0.87 - 3.84		
Retired	337	(65.2)	180	(34.8)	1.53	0.80 - 2.93		
Other	46	(66.7)	23	(33.3)	1.64	0.74 - 3.64	2.63 (3)	0.45
Accommodation (n=720)								
Home owner	398	(65.0)	214	(35.0)	1.00	referent		
Rented (private or council)	72	(66.7)	36	(33.3)	1.08	0.70 - 1.66	0.12 (1)	0.74
Deprivation index (n=729)								
(most affluent) 1	97	(65.5)	51	(34.5)	1.00	referent		
2	88	(60.3)	58	(39.7)	0.80	0.50 - 1.28		
3	94	(65.3)	50	(34.7)	0.99	0.61 - 1.60		
4	102	(68.9)	46	(31.1)	1.01	0.72 - 1.90		
(most deprived) 5	94	(65.7)	49	(34.3)	0.90	0.62 - 1.64	2.49 (4)	0.65
Physical activity (total METs) excluding leisure walking (n=741)								
Tertile (least active) 1	141	(57.1)	106	(42.9)	1.00	Referent		
2	171	(69.2)	76	(30.8)	1.69	1.17 - 2.45		
3	172	(69.6)	75	(30.4)	1.72	1.19 - 2.50	11.09 (2)	0.004

Table 9. Logistic regression analysis* of baseline respondent characteristics associated with walking for leisure at or above recommended levels (≥ 2.5 hours per week at ≥ 3 METs' intensity) in the previous week, compared with all other respondents.

N=679 **Variable (n)**		**Estimated Odds ratio Exp(B)**	**95% CI for Exp(B)**	**p-value**
Age group				
< 65 years		1.00	Referent	
65-70 years		1.03	0.72 - 1.49	0.86
75+ years		0.86	0.51 - 1.46	0.59
Gender				
Female		1.00	Referent	
Male		1.20	0.83 - 1.74	0.33
Education				
Degree		1.00	Referent	
Some qualifications		1.33	0.87 - 2.05	0.19
No qualifications		1.11	0.72 - 1.71	0.63
Work status				
Full-time		1.00	Referent	
Other		1.69	0.85 - 3.39	0.14
Deprivation index				
(most affluent)	1	1.00	Referent	
	2	0.72	0.44 - 1.19	0.20
	3	0.92	0.56 - 1.53	0.76
	4	1.05	0.63 - 1.76	0.84
(most deprived)	5	1.06	0.63 - 1.80	0.82
Physical activity (total METs) excluding leisure walking				
Tertile (least active)	1	1.00	Referent	
	2	1.58	1.07 - 2.33	0.02
	3	1.63	1.10 - 2.41	0.02

* Simultaneous entry.

Estimate of variance accounted for in the analysis:
Cox & Snell R Square = 0.025
Nagelkerke R Square = 0.034

Goodness of fit statistic:
Hosmer & Lemeshow test X^2 12.29 df 8 p=0.14

Table 10a. Summary level (geometric mean*, 95% CI) of physical activity at baseline, month 3 and month 12 by gender, for participants completing each stage of the evaluation.

	Baseline			Month 3			Month 12		
	N	Mean	95% CI	N	Mean	95% CI	N	Mean	95% CI
Female	534	42.1	[38.5-46.1]	425	31.5	[27.9-35.5]	391	35.5	[31.5-40.4]
Male	203	47.9	[41.3-55.7]	170	44.26	[37.7-52.5]	152	46.5	[38.5-56.8]
All	737	43.8	[40.5-47.0]	595	34.8	[31.5-38.5]	543	38.5	[34.5-42.5]

Table 10b. Summary level (geometric mean*, 95% CI) of physical activity at baseline, month 3 and month 12 by gender, last observation carried forward ('intension-to-treat' analysis).

	Baseline			Month 3		Month 12	
	N	Mean	95% CI	Mean	95% CI	Mean	95% CI
Female	534	42.1	[38.5-46.1]	32.1	[28.8-35.9]	33.4	[30.0-37.3]
Male	203	47.9	[41.3-55.7]	40.9	[34.8-47.9]	41.3	[34.8-49.4]
All	737	43.8	[40.5-47.0]	34.5	[31.5-37.3]	35.5	[32.5-38.9]

*The antilogged values shown in the two tables are in the original units of MET hours/week. The antilog mean is referred to as the geometric mean.

Table 11. Difference in mean baseline level of physical activity (MET/hours/week) by completion of each stage of follow-up

	N	Mean	95% CI	P-value
Completed 3 month follow-up	595	46.9	[42.9-49.4]	
Did not complete 3 month follow-up	142	32.1	[26.6-39.3]	0.0002
Completed 12 month follow-up	545	47.0	[43.4-51.4]	
Did not complete 12 month follow-up	192	34.8	[29.7-41.3]	0.0008

Table 12. Previous led walk participation and related attitudes: responses at baseline, 3 months and 12 months comparing English and Scottish sub-groups.

		All		England		Scotland	
		No.	(%)	No.	(%)	No.	(%)
Baseline questionnaire (n=750*)							
Number of participants who had been on a led walk before (n=745*)		631	(84.7)	500	(83.8)	131	(88.5)
Number of participants completing a led walk in the previous month (n=738*)		588	(79.7)	462	(78.2)	126	(85.7)
3 month questionnaire (n=603*)							
Number of participants completing a led walk in the previous 7 days		390	(67.2)	312	(67.1)	78	(67.8)
Number of led walks completed during previous 3 months (n=557)	None	29	(5.2)	23	(5.1)	6	(5.6)
	1 to 3	44	(7.9)	39	(8.7)	5	(4.6)
	4 to 11	250	(44.9)	192	(42.8)	58	(53.7)
	>11	234	(42.0)	195	(43.4)	39	(36.1)
'Do you do more walking since you were introduced to the health walks scheme?' (n=576)	Yes	415	(72.0)	335	(72.5)	80	(70.2)
'Have you felt any particular benefits from participating in the Health walks scheme?' (n=561)	Yes	491	(87.5)	387	(86.2)	104	(92.9)
12 month questionnaire (n=551*)							
Number of participants completing a led walk in the previous 7 days (n=537)		340	(63.3)	267	(61.7)	73	(70.2)
Number of led walks completed during previous 9 months (n=528*)	None	42	(8.0)	40	(9.4)	2	(1.9)
	1 to 17	108	(20.5)	78	(18.4)	30	(28.8)
	18 to 35	205	(38.8)	166	(39.2)	39	(37.5)
	36 or more	173	(32.8)	140	(33.0)	33	(31.7)
'Do you do more walking since you were introduced to the health walks scheme?' (n=529))	Yes	379	(71.6)	305	(71.9)	74	(70.5)
'Have you felt any particular benefits from participating in the Health walks scheme?'(n=504*)	Yes	433	(85.9)	341	(84.4)	92	(92.0)

*Denominators represent the number of at least partially completed questionnaires that were returned, but nevertheless vary due to missing responses for particular items.

Table 13a Difference in 3-month level of physical activity by participation in led walks in the previous 3 months for 3 month completers

	N	Mean	95% CI	P-value
0 led walks	11	22.6	[7.39-68.7]	
1-3 led walks	464	36.2	[32.5-40.4]	
4-11 led walks	43	27.4	[18.2-40.4]	
>=12 led walks	31	43.4	[29.4-63.4]	0.23

Table 13b Difference in 12-month level of physical activity by participation in led walks in the previous 9 months for 12 month completers

	N	Mean	95% CI	P-value
0 led walks	41	27.4	[16.1-46.5]	
1-17 led walks	106	44.5	[35.5-55.7]	
18-35 led walks	204	38.4	[32.5-45.2]	
>=36 led walks	169	47.9	[41.7-55.7]	0.03

Table 14. Change in 12-month level of physical activity over baseline by participation in led walks in the previous 9 months for participants that completed 12 month led walk question.

	N	Mean difference	95% CI	P-value
0 led walks	41	-1.8	[-2.7, -1.2]	
1-17 led walks	107	-1.1	[-1.4, 1.1]	
18-35 led walks	205	-1.8	[-1.4, -1.0]	
≥ 36 led walks	169	-1.1	[-1.2, 1.0]	0.02

Table 15. Categorisation of types of walking that respondents said they did more of (in free text), since being introduced to the health walks scheme: comments received at 3 months and again at 12 months from the start of the evaluation.

	3 month follow-up n=414*		12 month follow-up n=382*	
	No.	(%)	No.	(%)
Types of walking:				
Health walks or walking with groups mainly or only.	117	(28.3)	118	(30.9)
Around local neighbourhood	56	(13.5)	64	(16.8)
For shopping	42	(10.1)	34	(8.9)
Regular/frequent long walks	42	(10.1)	34	(8.9)
Short, slow or gentle walks only	23	(5.6)	9	(2.4)
Country walks	19	(4.6)	24	(6.3)
Brisk, 'power' or hill walking	18	(4.3)	14	(3.7)
Exercising the dog	5	(1.2)	7	(1.8)
Fair weather only	1	(0.2)	0	(0.0)
Walking holidays or sponsored walks (infrequent)	1	(0.2)	8	(2.1)
Miscellaneous	87	(21.0)	52	(13.6)

*the denominator refers to the overall number of people who provided any comments.

Table 16. Categorisation of benefits cited (free text) from participating in health walks scheme: comments received at 3 months and again at 12 months from the start of the evaluation.

	3 month follow-up n=478*		12 month follow-up n=431*	
	No.	(%)	No.	(%)
Commonly cited benefits:				
Social contact/making new friends	125	(26.2)	96	(22.3)
Improved fitness and energy	118	(24.7)	101	(23.4)
Increased sense of well-being and confidence	44	(9.2)	49	(11.4)
Improved joint problems and mobility	29	(6.1)	24	(5.6)
Incentive to 'get out'	27	(5.6)	26	(6.0)
Improved breathing	16	(3.3)	12	(2.8)
Desired weight loss	10	(2.1)	8	(1.9)
Improved cardiovascular health	9	(1.9)	8	(1.9)
Improved sleeping ability and quality	7	(1.5)	6	(1.4)
Miscellaneous	93	(19.5)	101	(23.4)

*the denominator refers to the overall number of people who provided any comments.

Table 17. Ways in which people first heard about the existence of Health Walks cited (free text): comments received at 3 months from the start of the evaluation.

	3 month follow-up n=571*	
	No.	(%)
Source of information:		
Advert in local newspaper or parish magazine	142	(24.9)
Word-of-mouth – friend/relative/neighbour	133	(23.3)
Council leaflet or poster – through letterbox, or seen in library or swimming baths etc.	118	(20.7)
Health-related: GP/Health centre/rehab group	103	(18.0)
Talk given by HW leader to local group or organisation	25	(4.4)
Via an organisation or charity eg. Age concern, Citizen's advice bureau	17	(3.0)
Via other walking groups eg. Ramblers association	6	(1.1)
From Countryside Agency directly	4	(0.7)
Miscellaneous (eg. radio, through work)	23	(4.0)

*the denominator refers to the overall number of people who provided any comments

Table 18. Comparison of men and womens' responses to questions, at baseline, regarding perceived barriers to walking in their neighbourhood.

	EVERYONE		FEMALES		MALES		P=
	No	%	No	%	No	%	
I would walk more around my neighbourhood, but….							
1. I have problems with my health (eg. breathlessness, dizziness or painful joints). n=655	129	(19.7)	83	(17.8)	46	(24.5)	0.07
2. There is no-one to go walking with me around where I live. n=661	168	(25.4)	140	(29.6)	28	(14.9)	<0.001
3. There is nowhere green/pleasant to walk near my home. n=653	52	(8.0)	34	(7.3)	18	(9.6)	0.42
4. I would walk more but there are no pavements around where I live. n=656	10	(1.5)	5	(1.1)	5	(2.6)	0.26
5. There is nowhere to go around where I live (eg. shops, pub, church, park). n=657	23	(3.5)	18	(3.8)	5	(2.7)	0.61
6. I worry about my personal safety around where I live (eg. being attacked). n=659	201	(30.5)	172	(36.4)	29	(15.5)	<0.001
7. I worry about being knocked down by a cyclist riding on the pavement. n=655	71	(10.8)	48	(10.3)	23	(12.2)	0.56
8. I worry about tripping over broken paving stones. n=655	117	(17.9)	84	(18.0)	33	(17.5)	0.86
9. There is too much traffic on the roads around where I live. n=660	116	(17.6)	80	(17.0)	36	(19.0)	0.61
10. There is too much pollution around where I live. n=652	72	(11.0)	46	(9.9)	26	(13.8)	0.19
11. Other reasons. n=735	78	(10.6)	51	(9.6)	27	(13.2)	0.21

Table 19. Characteristics of individuals citing any external barriers to walking around their neighbourhood versus those who named none (unadjusted analysis).

Variable (n)	Any external barrier to walking cited?				Odds ratio	95% CI	χ^2 (df)	p-value
	Yes		No					
	n	%	n	%				
Country (n=670)								
England	301	(56.4)	233	(43.6)	1.00	Referent		
Scotland	68	(50.0)	68	(50.0)	0.77	0.53 -1.13	1.78 (1)	0.18
Age group (n=664)								
< 65 years	161	(53.8)	138	(46.2)	1.00	referent		
65-70 years	160	(55.2)	130	(44.8)	1.06	0.76 - 1.46		
75+ years	43	(57.3)	32	(42.7)	1.15	0.69 - 1.92	0.32 (2)	0.85
Gender (n=670)								
Female	284	(59.0)	197	(41.0)	1.00	referent		
Male	85	(45.0)	104	(55.0)	0.57	0.40 - 0.80	10.86 (1)	0.001
Ethnicity (n=665)								
White	346	(94.6)	286	(45.3)	1.00	referent		
Other	20	(5.4)	13	(39.4)	1.27	0.62 - 2.60	0.44 (1)	0.51
Marital status (n=658)								
Married/cohabiting	171	(46.7)	195	(53.3)	1.00	referent		
Other	192	(65.8)	100	(34.2)	2.19	1.59 - 3.01	23.79 (1)	0.00
Education (n=639)								
Degree	69	(45.4)	83	(54.6)	1.00	referent		
Some qualifications	132	(57.1)	99	(42.9)	1.06	1.06 - 2.42		
No qualifications	149	(58.2)	107	(41.8)	1.68	1.12 - 2.51	7.14 (2)	0.03
Work status (n=666)								
Full-time	21	(52.5)	19	(47.5)	1.0	referent		
Part-time	53	(56.4)	41	(43.6)	1.17	0.56 - 2.46		
Retired	253	(54.2)	214	(45.8)	1.07	0.56 - 2.04		
Other	41	(63.1)	24	(36.9)	1.55	0.70 - 3.44	2.0 (3)	0.57
Accommodation (n=654)								
Home owner	295	(53.1)	261	(46.9)	1.00	referent		
Rented (private or council)	65	(66.3)	33	(33.7)	1.74	1.11 - 2.74	0.02 (1)	0.02
Deprivation index (n=658)								
(most affluent) 1	69	(51.1)	66	(48.9)	1.00	referent		
2	69	(52.7)	62	(47.3)	1.07	0.66 - 1.72		
3	66	(49.3)	68	(50.7)	0.93	0.58 - 1.50		
4	69	(55.2)	56	(44.8)	1.18	0.72 - 1.92		
(most deprived) 5	90	(67.7)	43	(32.3)	2.00	1.22 - 3.29	11.53 (4)	0.02

Table 20. Results of logistic regression analysis of characteristics of individuals naming any external barriers to walking around their neighbourhood versus those who named none.

N=614

Variable (n)	Estimated Odds ratio Exp(B)	95% CI for Exp(B)	p-value
Country			
England	1.00	Referent	
Scotland	0.78	0.52 -1.18	0.24
Age group (n=664)			
< 65 years	1.00	Referent	
65-70 years	0.92	0.64 - 1.33	0.67
75+ years	0.91	0.49 - 1.66	0.75
Gender			
Female	1.00	Referent	
Male	0.62	0.43 - 0.91	0.02
Marital status			
Married/cohabiting	1.00	Referent	
Other	1.88	1.29 - 2.73	0.001
Education			
Degree	1.00	Referent	
Some qualifications	1.40	0.91 - 2.17	0.13
No qualifications	1.29	0.83 - 2.01	0.26
Accommodation			
Home owner	1.00	Referent	
Rented (private or council)	1.25	0.75 - 2.12	0.39
Deprivation index			
(most affluent) 1	1.00	Referent	
2	1.01	0.61 - 1.68	0.97
3	0.91	0.55 - 1.51	0.70
4	1.17	0.69 - 1.98	0.56
(most deprived) 5	1.96	1.13 - 3.39	0.02

Each variable in the model has been adjusted for country, age, sex, marital status, education, accommodation and position on deprivation index.

Estimate of variance accounted for in the analysis:
Cox & Snell R Square = 0.070
Nagelkerke R Square = 0.093

Goodness of fit statistic:
Hosmer & Lemeshow test X^2 1.997 df 8 p=0.981

Table 21 Citing any external barriers to walking around their neighbourhood (versus citing none), at baseline, according to the number of Health Walks participated in subsequently.

		External barrier(s) cited at baseline	**No External barrier(s) cited**	**P=**
3 month follow-up		No (%)*	No (%)	
Number of Health Walks attended in last 3 months:	0	12 (46.2)	14 (53.8)	
	1-3	21 (53.8)	18 (46.2)	
	4-11	127 (55.7)	101 (44.3)	0.64
	12+	105 (50.5)	103 (49.5)	
12 month follow-up				
Number of Health Walks attended in last 9 months:	0	21 (55.3)	17 (44.7)	
	1-17	54 (54.5)	45 (45.5)	
	18-35	99 (53.2)	87 (46.8)	0.53
	36+	71 (46.7)	81 (53.3)	

Appendix

I. Information about Health Walks (WHI) structures and contact details.
II. Additional information about ‘first-timers’.
III. Copies of baseline, 3 month and 12 month follow-up questionnaires.

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Further information (including contact details for different regions can be found on the WHI website: http://www.whi.org.uk/