



leeds metropolitan university

THE NATIONAL EVALUATION OF LEAP:

Final Report on the National Evaluation
of the Local Exercise Action Pilots:

Prepared for

**Department of Health,
Countryside Agency
& Sport England**

By the

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With **Matrix RCL & Ipsos MORI**



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NATIONAL EVALUATION

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1 EXECUTIVE SUMMARY

1.1 Introduction

- 1.1.1 A report by the Chief Medical Officer, *At Least Five a Week*, (DH, 2004a) has highlighted that a significant proportion of the population are not meeting the Government's physical activity recommendations.
- 1.1.2 While the evidence base on the health benefits of physical activity is convincing (DH, 2004a, US Dept of Health & Human Services, 1996), more information is needed to identify the most effective interventions for getting people physically active (US Centres for Disease Control (CDC), Kahn, 2002) and meeting recommended guidelines for physical activity participation (DH, 2004a). Recently the National Institute for Health & Clinical Excellence (NICE) (2006b) have highlighted the importance of evaluating the impact of community based physical activity interventions.
- 1.1.3 In developing a greater understanding of which interventions help people to meet the physical activity recommendations, the Department of Health, Sport England and the Countryside Agency commissioned the Local Exercise Action Pilots (LEAP). LEAP built upon the previous work by the CDC (2002) that began to identify effective approaches for increasing physical activity participation.
- 1.1.4 LEAP aimed to find out *"What were the most effective types of interventions for getting the general population, including people from priority groups to initiate and maintain regular moderate intensity physical activity, and to reduce the numbers of sedentary adults and children?"*
- 1.1.5 LEAP involved the implementation and evaluation of interventions in 10 sites situated in Primary Care Trusts (PCTs).

1.1.6 Each LEAP site piloted one or more physical activity interventions and these were:

- Exercise referral.
- Classes and groups.
- Motivational interviewing.
- Peer mentoring.
- Campaigns and directories.
- Outdoors and transport.
- Training leaders and co-ordinators.

1.1.7 In addition five LEAP sites had community wide awareness raising interventions (campaigns) aimed at the general population. All LEAP sites focused interventions on at least one physical activity priority group identified in *At Least Five a Week* (DH, 2004a).

1.2 The Evaluation Methodology

1.2.1 In an attempt to establish which LEAP interventions were effective, a National Evaluation was undertaken using two related approaches:

- A case study performed in 10 sites by Leeds Metropolitan University working in collaboration with Matrix RCL between April 2004 and February 2006.¹
- A community survey undertaken by Ipsos MORI in 5 LEAP and 1 control site between November 2003 and November 2005.

¹ Dudley withdrew from the substantive part of the National Evaluation in April 2005. Dudley still undertook a local evaluation and made a contribution to the National Evaluation of LEAP.

1.2.2 The National Evaluation was informed by data collected through self report measures on the:

- Demographic profile of participants.
- Levels of physical activity undertaken by participants, before during and at the end of interventions classified as sedentary, lightly, moderately and highly active.²
- Participants' experience of the interventions.
- Key design characteristics of interventions effective in engaging and facilitating an increase in participants' physical activity level.
- Costs of running LEAP interventions.
- Cost effectiveness of LEAP interventions.
- Changes in the awareness and physical activity level of the community as a whole.

1.2.3 The findings of the evaluation should be viewed with the following caveats in mind.

- A snap shot of a participant's typical weekly physical activity behavior was taken. Physical activity was measured before then during the intervention period, for comparison to pre-intervention. Where multi-weeks were assessed in this period (maximum of 4), averages were taken. It is worth noting that higher participant attrition would have occurred over a longer intervention measurement period.³
- The LEAP intervention period was a relatively short period of time.⁴
- Seasonal variations which are known to influence participation rates particularly among children and older adults will have influenced the timing of both the intervention and the data capture process for the case study, where it was

² Interquartile ranges (IQR) for physical activity outcomes are presented for the LEAP programme overall and for intervention types. These are shown in the Executive Summary and Findings once only.

³ Buckworth & Dishman (2002) indicate that 50% of participants who initiate a programme of physical activity will cease to do so within 6-9 months.

⁴ LEAP Interventions ran from April 2004 -December 2005. Not all interventions ran for this duration. In some sites LEAP interventions continued to run after this date.

necessary to collect data at different times in the year. The community survey was carried out at the same time of year before and then after most of the interventions had been completed. However in some of the LEAP sites in the sample, interventions ran beyond the date when intervention data was captured.

- From our communications with staff working in the sites, we know some participants engaged and completed the interventions, but did not engage or complete the evaluation of LEAP. This evaluation reports on the outcomes of participants who engaged and/or completed the LEAP evaluation.
- There was a high level of attrition in the sample. Participants who provided both baseline and intervention physical activity data account for approximately 10% of all participants who engaged LEAP interventions⁵ and approximately 20% of participants who engaged the National Evaluation of LEAP. Therefore there is a potential self selection bias. It is possible that those participants who completed LEAP interventions and who provided both baseline and intervention physical activity data differ from those participants who (i) dropped out, and/or (ii) did not provide data for the National Evaluation.
- In response to concerns over potential self selection bias, it is worth noting that a cross tabulation was undertaken of the physical activity behavior based on a sample of 1051. These participants contributed both baseline and intervention physical activity data and analyses identified participants who demonstrated physical activity behavior across a spectrum of 'change'. Participants were found to have progressed, regressed and maintained their physical activity category.
- In this report participants are referred to as a 'completer' where they provided (i) a baseline and an intervention measure for physical activity or (ii) where they provided an intervention measure that was compared with a baseline measure

⁵ With the exception of campaigns and directories.

to demonstrate the effect of the LEAP programme on overall physical activity levels.

- Given that the sample of completers represented as little as approximately 10% of the overall participant numbers, we did not conduct intention-to-treat analysis. Comparing the 90% [assumption of no change] with the 10% [possibility of change] highlights the impossibility of detecting any real positive effects. Intention-to-treat is best adopted where researchers can ensure high levels of compliance to a research protocol (which includes completing questionnaires and diaries). Where this is not always possible – as in LEAP – effective interventions are always disadvantaged. Further, ‘no effect’ outcomes are subject to Type II error.
- Small sample sizes in some interventions limit the generalizability of the results.
- Not all participants provided data on demographic profile. Whilst these analyses were undertaken, there was no attempt to control for any covariates since this would have reduced the sample size still further.
- The data provided reflect participant’s self-report. More specifically:
 - Individuals often over-report their level of physical activity. Children, young people and older adults have difficulty in accurately recalling physical activity behaviour.
 - Some participants who provided evaluation data may have already been engaged in physical activity and physical activity interventions. As such they may be more motivated than others to participate in LEAP and the evaluation.
 - Practitioners have a vested interest in showing the success of their interventions and may over-estimate the intervention effect.
- In community delivery it has not been possible to control for factors that may have influenced behaviour.

- Factors beyond the LEAP interventions, such as individual and environmental capacity to become active, also contribute to the intervention effects reported here.

1.3 The Findings

1.3.1 Engagement in the National Evaluation

- Excluding campaigns and directories a total of 10433 participants engaged in LEAP of which 5324 participated in the initial stages of the National Evaluation.⁶ This accounts for approximately 50% of the participants who engaged LEAP interventions (excluding campaigns and directories). Approximately 10% (1051) of all participants who engaged LEAP interventions (excluding campaigns and directories), provided both a baseline and an intervention measure for physical activity participation. **Figure 1 Appendix 1** illustrates participant engagement in the different stages of the National Evaluation of LEAP.

1.3.2 Demographic profile of participants who engaged LEAP

- Distribution of gender/age (N=4835), indicate LEAP engaged young people, including young girls/ women, older adults including women, and men and women 75+.
- Adult women were engaged more than adult men often in a 2:1 ratio.
- Data on ethnicity (N=5202), indicate LEAP engaged mainly white British participants, although BME participants were engaged. Difficulties were encountered in engaging BME participants in the evaluation and therefore, these figures under-represent the scale of BME engagement within LEAP.

1.3.3 The effect of LEAP on overall physical activity levels.

- Key analyses involved those participants with baseline and intervention data, i.e. completers (N=1051). This is approximately 10% of the 10433 participants who engaged LEAP interventions (excluding campaigns and directories).

⁶ Due to difficulties associated with capturing data, not every participant provided data for each element of the National Evaluation and this explains the variation in sample size through the different elements of the evaluation.

- Calculation of differences between baseline and intervention data in completers showed a positive intervention effect ($p < 0.001$) with a median increase of 223 MET-minutes/week, (Interquartile Range (IQR) = 1343 MET-minutes/week). This equates to approximately 75 minutes of additional brisk walking/week.
- 59.9% of completers who were sedentary or lightly active at baseline achieved CMO recommended guidelines at intervention.
- 80.3% of sedentary and 63% of lightly active completers moved forward at least one activity category.
- Median values (MET-minutes/week) were also identified in nine sites for baseline activity (N=2783). These support the general increase in physical activity participation.⁷
- A median value of 780 MET-minutes/week (IQR = 1260 MET-minutes/week; equivalent to moderately active) was found for baseline data.
- These findings indicate the majority (60.2%) of participants engaged in LEAP were already meeting the CMO recommendations at baseline.
- Median values were identified for intervention physical activity data (N=1521) and these show:
 - 70.5% of completers were achieving CMO recommended guidelines (i.e., were moderately or highly active). This represents a median value of 1260 MET-minutes/week (IQR = 1410 MET-minutes/week; equivalent to highly active).
 - Comparing baseline (N=2783) to intervention (N=1521), physical activity data showed an increase in the percentage of completers achieving CMO recommended guidelines (+10.3%), a median increase of 480 MET-minutes/week.

⁷ The median is a value of central tendency less susceptible to poor distribution of data, and when taken at two different time points was used to establish typical activity patterns of participants at baseline and intervention. These values were then compared to evaluate overall change in activity behaviour expressed as median MET-minutes/week. This data set includes some participants who did not provide an intervention measure.

1.3.4 Overall physical activity change and defining demographic characteristics

- Demographic analyses reflect participants who contributed baseline and intervention physical activity data only, i.e. completers (N=1051).
- The extent of positive change (sedentary or lightly active at baseline, becoming moderately or highly active at intervention) was broadly equivalent for gender (male completers 66.3%; female completers 55.7%).
- 42% (N=178) of young people reported positive change (sedentary or lightly active at baseline, becoming moderately or highly active at intervention), this was the lowest percentage of positive change for any age category.
- Other values ranged from 48% (N=25) for older adults 75+ to 84% for adult completers (N=25).
- The extent of positive change (sedentary or lightly active at baseline, becoming moderately or highly active at intervention) relevant to ethnic origin ranged from 85.7% for ethnic minorities (N=56) to 61.9% for white British completers (N=318).
- A minimum of 1 in 2 completers reported positive change (sedentary or lightly active at baseline, becoming moderately or highly active at intervention) with regard to social grouping.
- In semi-routine occupations, positive change (sedentary or lightly active at baseline, becoming moderately or highly active at intervention) was reported by 50% (N=54) of completers. For completers in lower managerial and professional occupations the figure was 74.6% (N=126), 79.4% for routine occupations (N=61) and 85.7% for full-time students (N=13).

Conclusion

- The majority of participants in LEAP were already meeting recommendations; however a general increase in physical activity did occur in completers. This effect was particularly evident in completers not meeting the CMO recommended guidelines at baseline.
- LEAP also engaged a range of physical activity priority groups.

1.3.5 Physical activity change across the themes

- Calculation of median differences (baseline versus intervention) showed a negative intervention effect for completers in classes and group -36.9 MET-minutes/week (N=464; IQR = 1505 MET-minutes/week), but positive intervention effects for completers in:
 - Exercise referral +405 MET-minutes/week (N=460; IQR = 1211 MET-minutes/week).
 - Motivational interviewing +360 MET-minutes/week (N=77; IQR = 864 MET-minutes/week).
 - Campaigns and directories +150 MET-minutes/week (N=42; IQR = 951 MET-minutes/week).
 - Outdoors and transport +810 MET-minutes/week (N=8; IQR = 1198 MET-minutes/week).
- This represents additional weekly activity in the range of 50-270 minutes/week of brisk walking.
- No valid physical activity data were available for peer mentoring or training physical activity leaders and co-ordinators due to difficulties in capturing data. This is further explained within **Appendix 1**.
- The percentage of completers sedentary or lightly active at baseline, achieving CMO recommendations at intervention were as follows;
 - Exercise referral 67.6%.

- Classes and groups 50.7%.
- Motivational interviewing 86.2%.
- Campaigns and directories 75%.
- Outdoors and transport 100%.

1.3.6 Demographic characteristics & change in physical activity across the themes

Exercise Referral

- 67.6% of completers who were sedentary or lightly active at baseline achieved CMO guidelines at intervention.
- 80.4% of completers sedentary at baseline became lightly, moderately or highly active at intervention.
- Higher rates of positive change were found for male (81.5%) than female completers (55.4%).
- Older adults were predominantly engaged including those aged 65-74 and 75+.
- Participants from BME and participants from routine socio-economic groupings were also engaged.
- Qualitative data from participants and practitioners support reported outcomes on engagement and increases to recommended physical levels in adult/older adult completers.
- The design characteristics of interventions that were effective in engaging and facilitating an increase in the physical activity levels of adult/older adult completers were:
 - Partnerships with allied health professionals at the strategic and delivery level, this provided resources and support.
 - Simple referral protocols with clear participant referral criteria.
 - The use of stage matched resources.
 - Trained and skilful staff that understood and met participant needs.

- Linking into other physical activity programmes which provided a range of pre planned exit opportunities.

Conclusion

- Exercise referral is an effective intervention within an initial intervention period for engaging and facilitating an increase in the physical activity levels of adult and older adult completers. This includes those completers not meeting the recommended guidelines at baseline.
- The design characteristics of interventions are likely to have contributed to the reported outcomes on engagement and increases in physical activity participation in completers.
- The extent to which exercise referral is effective in sustaining levels of recommended physical activity participation in adults over longer timeframes to that used in this evaluation requires further investigation.

Classes and groups

- Based on median difference (baseline versus intervention), classes and groups showed a negative intervention effect for completers (-36.9 MET-minutes/week).
- When movement between physical activity categories was considered:
 - 79.1% of sedentary completers became lightly, moderately or highly active at intervention.
 - 50.7% of completers sedentary or lightly active at baseline became moderately or highly active in intervention.
 - 77.7 % of completers involved in classes and groups were children and young people.
- Difficulties associated with measuring physical activity with young people are reported in the findings of classes and groups in **Section 4**. These factors are likely to have contributed to the overall negative intervention effect, (-36.9 MET-minutes/week).

- Analysis of classes and groups by age indicated a median difference of +30 MET-minutes/week for adult completers.
- Qualitative data from participants and practitioners support outcomes on both engagement and increases in the physical activity levels of adults and young people (completers) not meeting CMO recommended levels at baseline.
- The design characteristics of interventions effective in engaging and facilitating an increase in the physical activity levels of young people and adult completers were:
 - Partnerships developed at the strategic and delivery level that provided resources and support.
 - Trained and skilful staff that understood and met participant needs.
 - Partnerships created with community groups and individuals that provided valuable information to enable interventions to be shaped to meet participant needs.
 - Linking into a framework of physical activity programmes, which offered a range of ongoing exit opportunities.

Conclusion

- Evidence offers cautious support for the positive effects of classes and groups within an initial intervention period, in engaging and facilitating an increase in physical activity participation in adult completers. The small sample size of adult completers and the use of qualitative data are caveats that require consideration with this conclusion.
- Exercise classes and groups help engage and within an initial intervention period facilitate an increase in the physical activity levels of young people (completers) not meeting the physical activity recommendations at baseline. The design characteristics of interventions are likely to have contributed to both engagement and increases in physical activity levels of completers.

- Further research is required to investigate the effectiveness of specific types of classes and groups in engaging and facilitating increases to recommended physical activity levels. This should be undertaken for both young people and adults over a longer time frame to that used in this evaluation.
- The use of effectively designed pilot projects with an evaluation will help facilitate this investigation. In doing so consideration should be given to both the sample size particularly with adults and the choice of data collection tools with all participants.

Motivational Interviewing (MI)

- Calculation of median differences (baseline versus intervention) showed a positive intervention effect in completers of +360 MET-minutes/week, (N=77). 89.3% (n=28) of completers who were lightly active at baseline achieved recommended guidelines at intervention.
- MI engaged more females than males as well as older people and participants from BME.
- Qualitative data from participants and practitioners is supportive of these trends on engagement and increases in physical activity levels in completers.
- The design characteristics of interventions effective in engaging and facilitating an increase in the physical activity level of adults/older adult completers were:
 - The use of client centred and stage matched protocols and resources.
 - Trained and skilful MI specialists who understood and met participant need.
 - The recruitment of allied health professionals who could refer participants into MI through their daily work via a simple referral protocol.
 - Linking into a framework of physical activity programmes, which offered a range of ongoing exit opportunities.

Conclusion

- MI was effective in engaging and within an initial intervention period effective in facilitating an increase in the physical activity levels of adults/older adult completers not meeting the CMO guidelines at baseline.
- The design characteristics of interventions are likely to have contributed to both engagement and increases in physical activity levels of completers.
- The small sample sizes in MI limit the generalizability of the findings.
- The effectiveness of MI over the longer time frame is not known from this study.
- Further research is required to investigate the effectiveness of MI in engaging adults and facilitating an increase in line with the CMO guidelines. This should be undertaken over a longer time frame to that used in this evaluation.
- The use of effectively designed pilot projects with an evaluation will help facilitate this investigation.

Peer Mentoring (PM)

- Due to the difficulties of data capture discussed within **Appendix 1**, no physical activity data was collected for PM.
- Qualitative data from participants and practitioners support that adults and older adults were engaged in PM.
- The design characteristics of interventions effective in engaging adults and older adults were:
 - The recruitment of skilful and knowledgeable mentors who understood and met the needs of mentees.
 - Training of and providing ongoing support for mentors.
 - Linking into a framework of other physical activity programmes, which offered a range of ongoing exit opportunities.
 - Partnerships created at the strategic and delivery level, which provided resources and support.

Conclusion

- Evidence supports the potential that PM can play in initially engaging adults, but no physical activity data exists to indicate effectiveness of PM in facilitating increases to recommended physical activity levels. Further investigation is required into the effectiveness of PM in engaging and facilitating increases in physical activity in line with the CMO guidelines. This should be undertaken over a longer time frame to that used in this evaluation.

Campaigns & Directories

- Due to the difficulties of data capture discussed within **Appendix 1**, only a very small amount (N=42) of physical activity data was collected.
- Evidence from practitioners supports that campaigns and directories had engaged participants including priority groups.
- No substantial evidence support that campaigns had been effective in increasing levels of physical activity participation to a recommended level.

Conclusion

Owing to difficulties in capturing physical activity data in this theme, it is difficult to report on effectiveness of campaigns in initiating and maintaining recommended increases in the physical activity levels of priority groups.

Outdoors & Transport

- Due to difficulties of data capture discussed within **Appendix 1**, only a very small amount physical activity data was collected (N=8).
- Qualitative data from participants and practitioners support that adults and young people were engaged in outdoor interventions.
- The design characteristics of interventions effective in engaging participants were:

- Partnerships created at the strategic and delivery level, which provided resources and support.
- Trained and skilful staff (including those working in green spaces) who understood and met participant needs.
- Partnerships created with community groups and individuals that acted as a reference point and provided valuable information and skills to enable interventions to be shaped so that participant needs were met.
- Organisational reform of parks services allowing for the promotion of physical activity in green spaces.

Conclusion

- Outdoor interventions led to the creation of new opportunities that engaged physical activity priority groups. Owing to the difficulties of data capture discussed within **Appendix 1**, it is not possible to report on the effectiveness of the Outdoor & Transport theme in initiating and maintaining recommended increases in the physical activity levels of priority groups. Further evaluation of outdoor and transport interventions is required.

Training Leaders and Co-ordinators

- Due to the difficulties of data capture discussed within **Appendix 1**, no physical activity data was collected from Training Leaders and Co-ordinators.
- Data from practitioners indicate that the exposure of 'leaders and co-ordinators' to training interventions led to the creation of new opportunities. These engaged physical activity priority groups including young people, adults, older adults and BME adult groups.
- The design characteristics of interventions effective in engaging these participants were:
 - The provision of resources, ongoing support, training and education.

- Training and education of practitioners who engage with priority groups as part of their daily business.
- Partnerships created at the strategic and delivery level, which provided support and resources.
- Developing training based on recognised principles and practices.

Conclusion

The training of leaders and co-ordinators led to the creation of new opportunities that engaged physical activity priority groups. Owing to difficulties in capturing physical activity data (**Appendix 1**), it is not possible to report on the effectiveness of Training Leaders and Co-ordinators in facilitating recommended increases in the physical activity levels of priority groups.

1.3.7 Economic Analysis

The distribution of funding sources of LEAP sites

- The proportion of funding received from LEAP ranges from c37% to c88%.
- The proportion of funding received from partners ranges from c12% to c63%.
- A small proportion of funding came from other sources which were not identified in this evaluation.

The monthly economic cost of running LEAP interventions

- The monthly cost of implementing LEAP interventions ranges from c£500 to c£9,200.
- There was no obvious relationship between LEAP intervention type and the monthly cost of implementation.

The cost per participant of LEAP intervention themes

- The cost per participant of LEAP interventions ranges from c£50 to c£3,400. There was no obvious relationship between LEAP intervention theme or type and cost per participant. Insights from the intervention practitioner interviews

suggest a number of factors that influence the cost of implementing LEAP interventions:

- **Method of participant engagement:** Certain interventions engaged participants in one-to-one designs, such as peer mentoring, motivational interviewing and one exercise referral intervention. Other interventions engaged participants through large groups, such as in campaigns, some classes and groups and referral programmes. Some classes and groups also engaged participants following a period of outreach work.
- **Nature of intervention delivery:** There was variation in the way intervention themes were delivered. One exercise referral intervention was delivered in people's homes. In another example a motivational interviewing intervention was delivered in a community centre. These facilities had to be hired, incurring higher staff time and travel costs compared with motivational interviewing interventions delivered via telephone. Interventions that required specialist facilities, such as aquatic venues, incurred higher costs than interventions using 'free' open space.
- **Development costs:** Certain interventions, for example, the healthy living maps campaign, required significant set-up costs, such as the professional design and production of materials. Other interventions, such as certain exercise referral programmes, were 'bolted-on' to existing programmes, thus reducing their development costs.
- **Specialist staff:** A number of interventions required staff with specialist skills. These included motivational interviewing, peer mentoring, exercise referral and some classes and groups.

These factors suggest ways in which an intervention type can be implemented in different ways and thus how costs can vary within intervention types. However further research and investigation is required to understand cost variation more thoroughly and verify these and other potential explanations.

Cost per participant who improved their physical activity category

- The cost per participant improving their physical activity category ranges from c£260 to c£2,790.
- There was no obvious relationship between LEAP intervention themes and cost per participant improving their physical activity level.

Costs per Quality Adjusted Life Year (QALY) Gained gained⁸

- The improvements in physical activity with LEAP will impact on the chances that participants will suffer adverse health states in the future. In turn, this will impact on the future quality of life a participant may have and future costs to the NHS of treating these health states.
- The cost per QALY gained from LEAP interventions range from c£50 to c£510.
- Importantly this was significantly lower than the £30,000 threshold implied by NICE decisions, below which an intervention is worth investing in.
- There was no obvious relationship between intervention theme and the cost per QALY gained from interventions. Further analysis is required to understand the factors that drive the cost per QALY gained from interventions.

Future financial savings to the NHS as a result of LEAP

- The improvements in physical activity with LEAP will impact on the chances that participants will suffer adverse health states in the future. In turn, this will impact on the future costs to the NHS of treating these health states.
- The future cost savings to the NHS per LEAP participant ranges from c£770 to c£4,900. In the case of each of the interventions, this saving per participant exceeds the cost per participant of implementing LEAP interventions.

⁸ QALYs (Quality Adjusted Life Years) are measures of quality of life. They take account of the duration of a life and the quality of each year in that life. Further detail on the definition and calculation of QALYs is available in appendix 2.

Caveats underpinning the economic analysis

- **Appendix 1** documents the limitations and what worked well when implementing the economic analysis. This includes the caveats underpinning the economic analysis. One extremely important caveat is the use of a pre and post research design. This is not the most robust way of isolating the impact of an intervention.
- Another caveat is that only 10% of participants who engaged LEAP interventions (excluding campaigns and directories) provided both a baseline and an intervention measure for physical activity participation. This raises the issue of a potential self-selection bias. However as the outcomes for cost per QALY gained are so impressive, this caveat is unlikely to make a difference to the conclusions drawn for cost per QALY gained using the £30,000 threshold implied by NICE decisions.

Conclusion

- Although there was variation within and between themes, LEAP interventions were affordable, cost effective; offer potential savings to the NHS and a worthwhile investment.
- The economic analysis suggests that LEAP as a whole is value for money, but it is unable to state which theme is most cost-effective.
- Further exploration of the nature of the interventions and the process of implementation is required to identify the factors that cause interventions to be more or less cost-effective.

1.3.8 The Ipsos MORI Community Survey

Levels of self-reported physical activity:

Overall physical activity

- Between 2003 and 2005 there was no statistically significant increase in physical activity at a community level in any of the LEAP sites. This indicates that the LEAP programme was not associated with increased physical activity at a community level.

Walking

- Total hours of reported walking increased between study years overall and in both LEAP and control respondents ($p < 0.05$) to a similar degree, so there was no observable “LEAP effect”.

Moderately active physical activity

- Other summary measures of participation in moderate intensity physical activity increased between 2003 and 2005 in both LEAP sites and the control site to a similar degree, so there was no observable “LEAP effect”.

Highly active physical activity

- Participation in highly active physical activity increased more in LEAP sites than controls. However this effect is removed when potential confounding factors were taken account of in a multivariate analysis.

Physical activity: Multivariate analysis

- A multivariate analysis showed that the LEAP programme was not associated with any changes in participation in recommended levels of physical activity at a community level either overall or for individual LEAP sites.

Participation in local physical activity programmes

- In the follow up survey, around 4%-5% of participants said they had participated in any event which was part of a local campaign or programme.

- This level of participation increased over time, but is not higher in LEAP sites when compared to the control site.

Awareness of key physical activity messages and community interventions

- Respondents living within LEAP sites were not more likely than participants in the control site to recall any campaign, the LEAP campaign specifically, or any of the main campaign components.
- There was no difference between LEAP and control sites in attitudes towards campaigns.

Intention to undertake physical activity

- Intention to be physically active increased to a similar extent in LEAP and control sites.
- There was a secular trend over time, but no effect of LEAP sites when compared to the control site.

Social climate for physical activity

- There was a significant increase in the likelihood of strongly agreeing with the social norm questions in LEAP sites when compared to the control site. This showed an effect of both secular trends over time, and high rates in the LEAP and control sites. This indicates that the LEAP programme may have improved social norms towards physical activity in LEAP sites.

Conclusion

- No significant change was found in physical activity at the community wide level, and there are a number of possible explanations for this. Firstly, this may have been due to an actual low penetration of LEAP interventions across the LEAP sites, with the activities reaching selected groups in the area, but not having a measurable population impact. Secondly, although this study used a validated questionnaire, it is possible that the tool was not sensitive enough to measure change in moderate intensity physical activity at the level expected

within a programme such as LEAP. Thirdly it is worth considering the effect of secular trends. Many of the measures in the study increased over time in both LEAP sites and the control site. This may mean that the sample sizes were not large enough for the study to be able to detect effects, given the size of the reported changes in controls. Finally, it is worth putting this into context. Those responsible for implementing the Community Survey have indicated that reviews (Cavil & Foster, 2004), of community-based physical activity programmes have shown that changes in physical activity are difficult to achieve at a community level and take significant investment and time. It may be that the LEAP programme was simply not resourced well enough to make an impact on population levels of physical activity or intention to be more active within the two-year timeframe.

1.4 Recommendations

1.4.1 For Commissioning Agencies

All LEAP interventions were cost-effective, but the economic analysis was unable to identify which intervention types were the most cost-effective. However analysis was able to identify the effect that some intervention types had on engaging and facilitating an increase in physical activity levels. This effect was identified with more certainty⁹ in some intervention types than in others; thus the recommendations set out in (1.4.1-3) are made on this basis.

In effectively purchasing physical activity interventions that engage and help facilitate an increase in the activity levels of participants including priority groups, commissioners of physical activity services are recommended to:

- Commission exercise referral.¹⁰ This was found to be both cost effective and effective within an initial intervention period in engaging and increasing the physical activity levels of adults and older adults not meeting the CMO guidelines for physical activity.
- Commission classes and groups for young people. These were found to be both cost effective and effective within an initial intervention period in engaging and increasing the physical activity levels of young people not meeting CMO guidelines for physical activity.
- Commission 'pilot' projects with an evaluation for classes and groups and motivational interviewing with adults. These were found to be both cost effective and effective within an initial intervention period in engaging and increasing the physical activity level of a small sample of adults. The effectiveness of these interventions with a larger sample requires further investigation.

⁹Analysis indicated that within the intervention theme, there was an overall increase in physical activity levels Intervention - Baseline median MET-minutes/week and/or sedentary completers progressing one physical activity category or sedentary or lightly active completers meeting CMO guidelines at intervention.

¹⁰ Commissioners are also referred to NICE (2006b) Public Health Intervention Guidance 2. Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community based exercise programmes for walking and cycling.

In all of the above recommendations, commissioners will need to explore how engagement and change can be translated into longer-term maintenance of the CMO guidelines beyond the initial intervention period used in this evaluation. Commissioning effectively designed interventions and an evaluation will help facilitate this exploration.

1.4.2 For Delivery Agencies

In effectively and efficiently implementing recommended interventions that engage and contribute to increases in the physical activity levels of priority groups, delivery agencies are recommended to:

- Pre plan interventions to assess and then meet the needs of participants. Recruit staff with a suitable range of skills for promoting physical activity with priority groups.
- Recruit community groups and individuals. They act as a reference point and provide valuable information for shaping interventions to meet participant need. This helps to engage priority groups in physical activity.
- Promote physical activity as part of a local strategy. This can facilitate the development of partnerships at the strategic and delivery level. Partnerships provide valuable resources for engaging priority groups in physical activity. These resources include skills, knowledge and facilities.

1.4.3 For Evaluation Agencies

In effectively evaluating community physical activity interventions evaluation agencies are recommended to:

- Adopt validated tools that are simply administered and understood by practitioners and participants. Where appropriate use adapted versions or alternative validated approaches to collect data. Build in pilot exercises and frequent quality assurance checks as these can increase the quality of the data.

- Have regular dialogue with those delivering interventions when developing data collection protocols. Act on feedback received as this can help shape data collection processes.
- Lead on making ethical clearance applications. Ensure that those involved in evaluation understand and adhere to ethical processes.

2 INTRODUCTION

This section provides an introduction and background to the National Evaluation of the Local Exercise Action Pilots (LEAP).

2.1 Who is the Report for?

This report is aimed at the commissioners, providers and evaluators of physical activity interventions.

2.2 The Aim of the Report

In the following sections this report:

- Provides an introduction and background to LEAP.
- Provides a background and a critical overview of the methods used to evaluate LEAP.
- Reports the key findings and conclusions on which LEAP interventions:
 - Are effective within an initial intervention period at engaging and increasing the physical activity of individuals within the community as a whole and from priority groups, including those not meeting the CMO guidelines for physical activity.
 - Are cost effective and a worthwhile investment.
- Provides guidance on the design and delivery characteristics of effective physical activity interventions.
- Recommends which physical activity interventions should be commissioned and how they should be delivered.

2.3 Introduction and Background to LEAP

A report by the Chief Medical Officer, *At Least Five a Week*, (DH, 2004a) has highlighted a significant proportion of the population are not meeting the Government's physical activity recommendations¹¹ and the case for physical activity

¹¹ Adults are recommended to undertake at least 30 minutes moderate physical activity on 5 or more days of the week, children and young people are recommended to undertake at least 60 minutes moderate physical activity on each day of the week. On 2-3 days of the week this should include activity that develops muscular skeletal health.

promotion. LEAP was a programme jointly funded by the Department of Health, the Countryside Agency and Sport England and aimed to develop and evaluate the most effective ways of getting people to meet the Government's physical activity recommendations, (DH, 2004a). LEAP was targeted at people who did little or no physical activity and who were at risk from poor health. The National Evaluation of LEAP aimed to find out:

“What are the most effective types of interventions for getting the general population, including people from priority groups, to initiate and maintain regular moderate intensity physical activity and to reduce the numbers of sedentary adults and children?”

2.4 Aims and Objectives of LEAP and the National Evaluation

LEAP had three key aims:

- To select and fund a programme of 10 LEAP sites, with at least one in each of England's 9 PCT regions.
- To evaluate the effectiveness of the interventions at engaging people in physical activity.
- To disseminate learning and good practice originating from LEAP amongst the health and physical activity community.

2.5 Government Policy and Goals

To increase levels of physical activity participation, a number of policies and strategies have been developed by the Government. *Game Plan* is the Government's strategy to increase physical activity participation and aims for 70% of people undertaking at least 30 minutes moderate physical activity on five days of the week by the year 2020. The interim goal is for 50% of people meeting the recommendations by 2011 (DCMS/Strategy Unit, 2002). Based on the current levels of physical activity, the 70% aim would require a 2% year on year increase resulting in 21 million people meeting Government recommendations. *The Wanless Report Good Health for the Whole of the Population*, (HM Treasury, 2004) identified

a more achievable goal of an annual 1% increase in population physical activity levels. *Choosing Health* (DH 2004b) and *Choosing Activity: A Physical Activity Action Plan* (DH, 2005a), map out a clear plan of action for the physical activity community to deliver this goal.

2.6 The Case for Physical Activity

Increasing the number of physically active people is important in addressing a number of health conditions, as described in the *Choosing Health* White Paper (DH, 2004b). *Choosing Health* sets out the prevalence of a number of conditions including obesity, cardiovascular disease and mental health. *At Least Five a Week* (DH, 2004a) provides convincing evidence for the role physical activity participation can play in preventing and managing these and other disease conditions. **Table 1** illustrates the strength of evidence of physical activity in preventing and treating disease conditions.

Table 1: Illustrates the Strength of Evidence of the Role of Physical Activity in Preventing and Treating Disease Conditions

PURPOSE	PREVENTION		THERAPY	
	Evidence	Effect	Evidence	Effect
CVD	***	***	**	**
Obesity	**	**	***	*
Cancer	**	**	-	-
Diabetes	***	***	**	*
Musculo-skeletal	***	**	**	**
Mental health	**	**	**	**

Key			
***	Strong evidence	**	Moderate evidence
*	Weak evidence	-	No evidence

Source: Department of Health. (2004) *At Least Five a Week: Evidence on the impact of physical activity and its relationship to health*. London, Department of Health.

2.7 Current Physical Activity Levels

2.7.1 Research has highlighted that levels of physical activity participation are a public health concern (ADNFS, HEA & Sports Council 1992, HEA, 1994, Department of Transport, 2001, Department of Health 2002). *At Least Five a Week*, (DH, 2004a) highlighted that 70% of the adult population was not undertaking sufficient physical activity to benefit their health. *The Health Survey for England (2002)* highlighted that 30% of boys and 40% of girls were not undertaking sufficient physical activity to benefit their health (DH, 2002).

2.7.2 In promoting physical activity *At Least Five a Week*, sets out the following recommended physical activity levels:

Adults

- Should undertake at least 30 minutes of at least moderate intensity physical activity on five or more days of the week.

Children & Young People

- Should undertake at least 1 hour of at least moderate intensity physical activity on each day of the week. At least twice a week this should include activities that develop bone health, muscle strength and flexibility.

Older People

- Should undertake the physical activity recommendations for adults. However older people should be careful to keep moving and retain their mobility through daily activity. They should participate in specific activities that develop strength, co-ordination and balance.

Specific Medical Conditions such as Obesity Prevention

- *At Least Five a Week* acknowledged the specific guidelines set for the prevention and management of particular medical conditions. For example for the purpose of preventing the onset of obesity, adults should undertake 45-60 minutes of moderate intensity physical activity on each day of the week.

Meeting the Recommendations

- The daily-recommended level of physical activity can be achieved in one session or through several shorter sessions of activity lasting 10 minutes or more.

2.8 Lack of Evidence of Effectiveness of Interventions

2.8.1 While the evidence base on the health benefits of physical activity is convincing, (DH, 2004a, US Dept of Health & Human Services; 1996), more information is needed to identify the most effective interventions for getting people physically active (US Centres for Disease Control (CDC), Kahn, 2002). LEAP built upon previous work by the CDC (2002) that began to identify effective approaches for increasing physical activity participation. The CDC concluded that there was a need for further research and this is in line with the findings of others. Hillsdon et al., (2005) indicate there was a need to conduct research into the effectiveness of physical activity interventions with a focus on people who are:

- Sedentary i.e. who are not meeting the recommendations for physical activity, including people from areas of high health need and those people who are socially excluded. These people face multiple barriers in becoming active and maintaining the recommendations for physical activity participation.

More recently the National Institute for Health & Clinical Excellence (NICE) (2006b). have highlighted the importance of evaluating the impact of community based physical activity interventions. In doing so they have offered guidance on how this can be undertaken within certain intervention types.

2.8.2 In developing a greater understanding of which interventions help people to meet the physical activity recommendations, the Department of Health, Sport England and the Countryside Agency commissioned LEAP.

2.9 Organisations involved in LEAP

LEAP involved a large number of organisations from the following three groups:

2.9.1 The LEAP Management Group

LEAP was commissioned and led by a LEAP Management Group (LMG) with membership from the Department of Health, Countryside Agency and Sport England with assistance from Yew Consulting.

2.9.2 The LEAP Sites

The delivery of LEAP interventions took place in 10 sites, situated in Primary Care Trusts (PCTs). The development and management of LEAP followed one of two models:

- PCT led development in collaboration with local partner agencies.
- Local Authority or Local Leisure Trust led development in collaboration with the PCT and local partner agencies.

2.9.3 The Evaluation Team

For LEAP to be evaluated, a National Evaluation was commissioned. The national evaluation comprised of two evaluation approaches:

- **A Case Study** undertaken by Leeds Metropolitan University working in collaboration with Matrix RCL. This comprised a common set of evaluation questions leading to the collection of qualitative and quantitative data from the LEAP programme and analysis of the cost/benefits of implementing LEAP interventions.
- **A Community Survey** undertaken by Ipsos MORI in 5 LEAP sites that included community wide interventions. A total of circa 4000 individuals were interviewed by telephone prior to and after the LEAP interventions were implemented. The main findings of this survey have been incorporated into this final evaluation report.

2.10 Pilot Sites, Context and Reasons for Selection

2.10.1 LEAP was developed in 10 sites based in England's 9 PCT regions. One site was selected in each region by the LMG, with the exception of the South West of England, where two sites were selected. Pilots were located in areas of high levels of deprivation and health inequalities.

2.10.2 The 10 LEAP sites were located in:

- Ashton, Wigan & Leigh, North West.
- Durham Dales, North East.
- Dudley, Beacon & Castle, West Midlands.
- Great Yarmouth, East.
- Hastings St Leonards', South East.
- Wandsworth, London.
- Nottingham City, East Midlands.
- North Kirklees, Yorkshire & Humberside.
- Plymouth, South West 1.
- West Cornwall, South West 2.

2.11 LEAP Interventions

Each LEAP site piloted one or more physical activity intervention(s).

For the purposes of evaluating the effectiveness of the different interventions these have been grouped into 7 categories, referred to as themes:

- **Exercise Referral:** Normally involves the referral of a participant by an allied health professional to a physical activity intervention undertaken within the local community. Participation may be undertaken on a one to one basis or in a group situation. The intervention is normally tailored to the needs of the participant. Exercise referral interventions took place at 5 LEAP sites.
- **Classes and Groups:** Normally involves the engagement of a participant in a structured or unstructured physical activity intervention. This typically takes

place in a community setting and includes any mode of physical activity.

Classes and groups took place at 8 LEAP sites.

- **Motivational Interviewing:** Normally involves the engagement of a participant in a series of one to one interviews with a trained advisor. These take place in the health or community setting and aim to help the participant develop capacity to engage in physical activity. Motivational interviewing took place at 4 LEAP sites.
- **Peer Mentoring:** Normally involves the engagement of a participant in dialogue and interaction with a peer of the same age group. The dialogue is aimed at promoting physical activity and developing capacity to help the participant become physically active, either independently or within a class situation external to peer mentoring. Peer mentoring interventions took place at 3 LEAP sites.
- **Campaigns and Directories:** Normally involves the engagement of a participant through a range of media, which promote physical activity. LEAP campaigns and directories include consultation, needs assessment, advertising, promotion and information on physical activity. Campaigns and directories took place at 6 LEAP sites.
- **Outdoors and Transport:** Normally involves the engagement of a participant in an unstructured or a structured intervention of physical activity in the outdoors. This includes active transport. Outdoor activities took place at 2 LEAP sites. A number of other intervention themes took place in outdoor locations such as parks, green spaces, and the countryside.
- **Training Leaders and Co-ordinators:** Normally involves the engagement of 'leaders' in a programme of training, support and education that facilitate the implementation of physical activity interventions for participants. Training of leaders and co-ordinators took place at 2 LEAP sites.

2.12 The Audience for LEAP Interventions

Five LEAP sites had community wide awareness raising interventions, but all LEAP sites focused interventions on at least one of the following groups identified in *At Least Five a Week* as a physical activity priority (DH, 2004a). These groups have the lowest levels of physical activity participation and face the greatest barriers in meeting the physical activity recommendations (DH, 2004a, HEA, 1999):

- Sedentary adults and young people.
- Older people.
- Black and minority ethnic groups (BME).
- Young people and adults with health conditions such as obesity, heart disease and mental health.
- Sedentary people from areas of high health need.

For the purposes of the evaluation, **Table 2** provides an overview of the LEAP Interventions by pilot site, evaluation theme (intervention type), descriptor, main setting and physical activity priority group(s) the intervention was aimed at.

Table 2: Overview of LEAP Interventions by Pilot Site, Main Setting, Theme and Priority Group

Pilot Site	Intervention Number and Description		Setting	Intervention Theme	Intervention Priority Group
Ashton, Wigan & Leigh	1	Campaign to promote physical activity	Community	Campaign & Directory	Adults Over 50's
	2	Community outreach	Community	Classes & Groups	Adults Over 50's
	3	Primary care based interventions	Primary Care	Exercise Referral	Adults Over 50's
	4	Senior peer mentoring intervention	Community	Peer Mentoring	Adults Over 50's
	5	Exercise referral intervention	Primary Care	Exercise Referral (with Motivational Interviewing Call)	Adults Over 50's
	6	Next Steps intervention	Community	Classes & Groups	Adults Over 50's
	7	Senior health walks intervention	Community	Outdoors & Transport	Adults Over 50's
	8	Falls prevention intervention	Secondary Health Care	Classes & Groups	Adults Over 50's
	9	Ethnic minorities needs assessment intervention	Community	Classes & Groups	Adults Over 50's
	10	Moving more often: physical activity training intervention for care workers	Secondary Health Care	Leaders Co-ordinators & Training	Adults Over 50's
	11	Training intervention for support staff	Secondary Health Care/Community	Leaders Co-ordinators & Training	Adults Over 50's
Durham Dales	1	Speed, agility, quickness intervention	School	Classes & Groups	Young people
	2a	Residential physical activity intervention	Community	Classes & Groups	Young people
	2b	Young people committee intervention	Community	Classes & Groups	Young people
	3	School/community physical activity interventions	Community/School	Classes & Groups	Young people
Dudley, Beacon & Castle	1	GP referral intervention to leisure facilities	Primary Care	Exercise Referral	Adults
	2	Self-referral intervention to the parks	Community	Classes & Groups	Adults & Young people
	3	Campaign to increase physical activity	Community	Campaign & Directory	Adults & Young people
Great Yarmouth	1	Weight management intervention	Primary Health Care	Exercise Referral	Adults
	2	Cardiac rehabilitation intervention	Secondary Health Care	Exercise Referral	Adult Cardiac Patients
	3	Community walking intervention	Community	Outdoors & Transport	Adults
	4	Community outreach intervention	Community	Classes & Groups	Adults and Adults Over 50's

Hasting St Leonards'	1	After school physical activity intervention	Community /School	Classes & Groups	Young People
	2	Summer physical activity intervention	Community	Classes & Groups	Young People
	3a	Walk to school intervention	School	Campaign & Directory	Young People
	3b	Theatre education intervention	School	Campaign & Directory	Young People
	4	Physical activity intervention for young single parents	Community	Classes & Groups	Adults (Young females parents)
Yorkshire	1	Campaign to promote physical activity	Community	Campaign & Directory	General population
	2	Physical activity intervention for CHD prevention	Community	Classes & Groups	Young People
	3	Physical activity intervention for women and South Asian women	Community	Motivational Interviewing	Young People/BME Young People (Women)
	4	Physical activity intervention for diabetes prevention	Primary Care	Exercise Referral	Adults/ Adults Over 50's
East Midlands	1	Audit of physical activity campaign	Community	Campaign & Directory	Adults Over 50's
	2	Campaign to promote physical activity	Community	Campaign & Directory	Adults Over 50's
	3	Physical activity intervention	Community	Classes & Groups	Adults Over 50's
	4	Senior peer mentoring intervention	Community	Peer Mentoring	Adults Over 50's
	5	Motivational interviewing intervention	Community	Motivational Interviewing	Adults Over 50's/BME
	6	Training intervention in behaviour change	Community	Training Leaders & Co-ordinators	Adults
London	1	Exercise referral to motivational interviewing in primary care	Primary Care	Motivational Interviewing	Adults/Adults Over 50's
	2	Physical activity campaign: healthy living map	Community	Campaign & Directory	General population
	3	Physical activity campaign	Community	Campaign & Directory	Adults and Young People
	4	Cycling and walking campaign	Community	Campaign & Directory	Adults and Young People
	5	Peer mentoring intervention	Community	Peer Mentoring	Adults Over 50's and volunteers
Plymouth	1	Free swimming physical activity intervention	Community	Classes & Groups	Young People
West Cornwall	1a	Community outreach intervention	Community	Exercise Referral	Young People
	1b	Community outreach intervention	Community	Exercise Referral	Adults/Adults Over 50

2.13 The Cost and Duration of LEAP

Both the LEAP interventions and the evaluation were funded for two years with some additional development and evaluation time before and after the Project. The cost of the LEAP programme to the commissioners was £2.6m.

3 THE NATIONAL EVALUATION METHODOLOGY

3.1 Aims and Research Methodology of the National Evaluation

The aims of the National Evaluation were to establish which physical activity interventions were effective at increasing participation among those who were sedentary, not meeting the CMO guidelines, and from priority groups. The National Evaluation was informed by data collected on the:

- Demographic profile of participants.
- Levels of physical activity undertaken by participants before, during and at the end of interventions.
- Participants' experience of the interventions.
- Key design characteristics of interventions.
- Costs of running interventions.
- Cost effectiveness of LEAP interventions.

The National Evaluation collected data through two related approaches:

- A Case Study (comprising three parts).
- A Community Survey.

3.2 The Case Study

A Case Study was conducted across all 10 LEAP sites between April 2004 and February 2006.¹² This collected both quantitative and qualitative data to inform the evaluation as set out in [section 3.1](#). Difficulties in collecting data at some of the interventions meant that not all LEAP sites provided data for each part of the Case Study. This explains the variation in sample size for different elements of the evaluation. Further detail on the problems encountered in collecting data is provided in [Appendix 1](#).

¹² Dudley withdrew from the substantive element of the National Evaluation in April 2005.

3.2.1 Participant Numbers and Demographic Profile

All sites collected data on the number of participants engaged in LEAP through head counts and activity registers. These participants were issued with a participant identification number.

Participants from 9 sites provided demographic data for the national evaluation. Where it could be collected demographic data was obtained by questionnaire and included age, gender, ethnicity and postcode. Many sites were reluctant to collect data on socio-economic status, viewing it as too intrusive, and in the end few sites provided this data. Postcodes were therefore used to make assumptions on the socio-economic class or social grouping of participants¹³ to inform the evaluation. The caveat with this approach is that this is unlikely to accurately reflect the social grouping of every LEAP participant.

In the analysis of the demographic data participants have been categorised by age group into children and young people aged 5-17, adults (HEA, 1997), 18-49 years and older adults. In order to reflect the diversity of sub groups within older adults, the group was split into the categories 50-64, 65-74 and 75+ using a framework adapted from the BHF National Centre for Physical Activity (2003). Application of these categories allowed the National Evaluation to record the breadth of behaviour within the group of older adults. For each of these age categories the number of participants by gender, ethnicity and occupational category were counted and recorded.

¹³ In order to investigate the socio-economic status of participants, the ward that the participant came from was obtained through their postcode. Using an approach adapted from the Centre for Regional Economic & Social Research at Sheffield Hallam University. "Census, key statistics for postcode sectors" were then used in order to investigate the occupation that the majority of individuals within the ward undertook. This occupation was recorded as that of the ward, from which the participant came and allowed an assumption of the socio-economic class or social grouping of that participant to be made.

3.2.2 Levels of Physical Activity

- The LEAP National Evaluation selected self-report as its major physical activity measurement tool. This decision was informed by:
- The number of individuals involved in the project.
- The resource available to support physical activity data captures.
- The skills and capacity of those people capturing data across the entire LEAP programme.
- The need for data on activity type, the assessment of which was an important consideration in allocating activity categories.

Physical activity data was collected using self-report tools such as the International Physical Activity Questionnaire (IPAQ) (www.ipaq.ki.se) or the Bristol Activity Diary (Page et al., 2000). Working closely with Leeds Metropolitan University, each LEAP site selected and piloted a self-report measure of physical activity. Selection was matched to the demands of the specific intervention and the capacity of those capturing data and the priority group. Using the self-report measure each site was then asked to collect data on participant's frequency (how often), intensity (how hard), duration (how long) and the mode (type) of physical activity. This data was collected for a typical week prior to the intervention beginning (baseline activity) and for a series of typical weeks during the intervention (intervention activity). This measure provided a snap shot of the physical activity behaviour of LEAP participants.

Following data collection, entry and transfer, physical activity data was thoroughly reviewed to normalise distributions. As is common and good practice, unreasonably low (activity bouts of less than 10 minutes duration per week) and high (activity bouts equal to or more than 900 minutes per week) values were removed from the

data set prior to analyses. All daily activity bouts greater than 240 minutes were capped at 240 minutes (www.ipaq.ki.se).

The data was then used to determine median¹⁴ METS values and the volume for each week of lightly, moderate and highly active physical activity. METS are multiples of resting metabolic rate. One MET is equal to a person's rate of energy expenditure when at rest.

The following equation was used to calculate weekly volumes: Frequency (days) x Duration (minutes) x Intensity (METS threshold). Intensity values were set at 3.0 METS for moderate intensity activity and at 6.5 METS for the highly active intensity activity. This is in line with the CMO's Report. (DH, 2004a).

Physical activity volumes were used to place participants into four categories of physical activity participation with separate categories for adults and young people – **Table 3**. The physical activity volumes were based on the Department of Health guidelines (2004a, p26), which suggest that:

- Young people should achieve a total of at least 60 minutes of at least moderate intensity activity each day of the week.
- Adults should achieve a total of at least 30 minutes of at least moderate intensity physical activity, on 5 or more days a week.

¹⁴ The median is a value of central tendency less susceptible to poor distribution of data, and when taken at two different time points was used to establish typical activity patterns of participants at baseline and intervention. These values were then compared to evaluate overall change in physical activity behaviour.

Table 3: MET–Minutes/Week Thresholds for Physical Activity Participation

Sedentary	Lightly Active	Moderately Active	Highly Active
Adults			
Physical Activity Level & MET Threshold			
Less than 1 session of 30 minutes of moderate physical activity or equivalent/week	1-4 sessions of 30 minutes of moderate physical activity or equivalent/week	5 sessions of 30 minutes of moderate physical activity or equivalent/week	5 sessions of 30 minutes of vigorous physical activity or equivalent/week
0-89 MET-minutes/week	90-449 MET-minutes/week	450+ MET-minutes/week	975+ MET-minutes/week
Children & Young People			
Physical Activity Level & MET Threshold			
Less than 1 session of 60 minutes of moderate physical activity or equivalent/week	1-6 sessions of 60 minutes of moderate physical activity or equivalent/week	7 sessions of 60 minutes of moderate physical activity or equivalent/week	7 session of 60 minutes of vigorous physical activity or equivalent/week
0-179 MET-minutes/week	180-1259 MET-minutes/week	1260+ MET-minutes/week	2730+ MET-minutes/week

Analysis was then undertaken to determine the extent of physical activity change with respect to the total weekly median MET values (MET-minutes/week) and changes in physical activity category.

3.2.3 The Participants' Experience of the Intervention

Data is available for all 10 LEAP sites. This data identifies the experiences of participants within the intervention and was collected using:

- Focus groups, interviews or questionnaires administered to participants.
- Interviews with the personnel working in lead and partner agencies within the LEAP sites.

3.2.4 The Design Characteristics of LEAP Interventions

Field researchers interviewed participants in a selection of sites as well as personnel working in lead and partner agencies at all LEAP sites. This aimed to identify the design characteristics LEAP interventions that contributed to the engagement of participants in physical activity. This was undertaken across the 7 intervention themes. Data was collected in a sample of 389 interviews. Within the evaluation the design characteristics identified have been grouped under the following headings:

- Pre project planning.
- Strategic context and fit.
- Intervention design.
- Exit routes and sustainability.
- Partnership working.
- Meeting the needs of participants.
- Finance and budgeting.
- Engagement of community participants and groups.
- Training and education.
- Attributes skills and capacity.
- Marketing and campaigns.
- Monitoring and evaluation.

3.2.5 The Cost of LEAP Interventions

A detailed account of how the economic data was collected and analysed is available in **Appendix 2**. Some of the challenges along with what worked well in implementing this part of Evaluation are discussed in **Appendix 1**. For the purposes of brevity, a summary of this process is provided here:

- Cost data was collected through interviews undertaken by research assistants with the intervention personnel at 9 of the LEAP sites¹⁵ and the data entered onto a financial spreadsheet and exported to Matrix RCL for analysis.
- The cost data was then analysed in conjunction with the physical activity data using the categories outlined in **Table 3** in order to identify the cost per participant and cost per participant improving their physical activity levels.
- The cost and physical activity data was modeled to determine the impact that LEAP interventions had on Cost per Quality Adjusted Life Year (QALY) gained, future savings to the NHS and if LEAP interventions were a worthwhile investment.
- **Appendix 2** provides a detailed overview of how the economic analysis was performed. As with any, the model used to determine the impact that LEAP interventions had on Cost per Quality Adjusted Life Year (QALY) gained¹⁶ and future savings to the NHS has to make certain assumptions. These are outlined in **Table 10 Appendix 2**, and include a standard rate of adherence to the physical activity recommendations. The uncertainty associated in making assumptions was dealt with by performing a sensitivity analysis. The results of which suggest that the conclusions drawn, are not sensitive to the assumptions made in applying the model. The results of the sensitivity analyses are reported in (**Appendix 6/7**), and these provide confidence that the model and its

¹⁵ Dudley withdrew from the substantive element of the National Evaluation in April 2005. Dudley provided data for the distribution of funding sources.

¹⁶ QALYs (Quality Adjusted Life Years) are measures of quality of life. They take account of the duration of a life and the quality of each year in that life. For further detail on the definition of QALYs see Appendix 2

application are robust. **Appendix 1** documents the limitations and what worked well when implementing the economic analysis. This includes the caveats underpinning the economic analysis. An extremely important caveat is the use of a pre and post research design, which is not the most robust way of isolating the impact of an intervention. Another caveat is that only 10% of participants who engaged LEAP interventions (excluding campaigns and directories) provided both a baseline and an intervention measure for physical activity participation. This raises a potential self-selection bias. However as the outcomes for cost per QALY gained are so impressive, this caveat is unlikely to make a difference to the conclusions drawn for cost per QALY gained using the £30,000 threshold implied by NICE decisions.

3.3 The Ipsos MORI Community Survey

3.3.1 An Ipsos MORI Community Survey was conducted at a population wide level in a total sample of circa 4000 participants in five participating LEAP sites, along with a control sample of circa 800. The five sites surveyed (Dudley Beacon and Castle, Great Yarmouth, North Kirklees, Wandsworth and West Cornwall) were those where interventions targeted at the whole community were originally proposed. A baseline survey took place in November 2003 prior to the start of LEAP interventions and a follow up survey was undertaken in November 2005. The aim of the survey was to establish if the LEAP interventions were successful at increasing the wider community's awareness of LEAP and physical activity, as well as actual physical activity levels. Participants in the survey were selected at random and included people who both did and did not participate in the LEAP interventions. A copy of the survey instrument is available as a management paper on request from the DH.

3.3.2 In both baseline and post intervention surveys data was collected on changes in:

- Levels of self-reported physical activity.
- Awareness of key physical activity messages and community interventions.
- Intention to undertake physical activity.
- Social climate for physical activity.

3.4 Ethical Evaluation

Data collected for the National Evaluation followed the procedures set out under the Research Governance Framework for Health and Social Care (DH, 2005b). The Framework outlines the broad principles of good research practice and was key in ensuring that evaluation was conducted to high scientific and ethical standards. In adhering to this framework, the Research Ethics Committee of Leeds Metropolitan University approved the National Evaluation for LEAP. Part of the approval was dependent upon LEAP sites obtaining Local Research Ethics Clearance (LREC) and for applications after 31/03/04, Central Research Ethics Clearance (COREC). COREC/LREC approval required each LEAP site to illustrate in their application how they would adhere to sound ethical practice when collecting and processing data for the National Evaluation.

3.5 Consent and Safety

Prior to collecting any data, participant's signed consent was obtained via a consent form. This form provided written information on the risks, benefits and procedures of participating in the intervention and evaluation. The written assent of a parent/guardian or equivalent was also obtained for children and young people. Where appropriate, participants were screened for health and safety issues prior to engaging in physical activity. Copies of these instruments are available as a management paper on request from the DH.

3.6 Quality Control

- 3.6.1** A series of regular evaluation workshops and meetings took place before and during the evaluation to help sites develop and implement the methodology used to collect data for the National Evaluation.
- 3.6.2** Written advice on the procedures used to collect and process data for the evaluation was provided to LEAP sites in the form of a guidance document. Researchers also provided site visits, email and telephone support. Data collected by sites was inputted into an Excel spreadsheet and sent to Leeds Metropolitan University for cleaning and analysis. Sites submitted data at regular intervals during the evaluation and data was checked for quality and quantity issues. Where appropriate feedback was issued to the sites on the amount of data that was usable/unusable and the possible reasons for this. Written and verbal guidance was given to sites on action that should be taken to increase the quality and quantity of data collected.

3.7 The Local Evaluation

Each site was also required to undertake a local evaluation and produce a report on the findings. This part of the evaluation focused on some locally defined questions on the effectiveness of interventions. In some sites data for the local evaluation was collected using focus groups, questionnaires and interviews. Sites collected this data, some in collaboration with a local evaluator such as a local university who provided advice and guidance. For those sites working independently without a local university, Leeds Metropolitan University provided the chance for sites to access advice on the design of the local evaluation. Some data collected through the local evaluation was used to inform the conclusions of the National Evaluation. A 2-page local evaluation summary from each site is included in **Appendix 3** and copies of the full local evaluation reports are available on request from the LEAP sites.

3.8 Feedback to the LEAP Sites

In line with sound research practice, all 10 LEAP sites received a summary of feedback on the data they submitted, as well as some of the data collected by Leeds Metropolitan University for the National Evaluation.

3.9 Summary of Data Capture

The different components of the evaluation have been drawn together to inform conclusions on the effectiveness of LEAP interventions. This was achieved by interpreting the findings of each component of the National Evaluation in parallel. This process produced a more complete understanding of the effectiveness of interventions and helps to answer the key question:

“What are the most effective types of interventions for getting the general population and people from priority groups to initiate and maintain regular moderate intensity physical activity, and to reduce the numbers of sedentary adults and children?”

4 RESEARCH FINDINGS & CONCLUSIONS

Summary of the Key Findings:

Change in Physical Activity Overall

- Of 10,433 LEAP participants, 5324 participated in the National Evaluation.
- Calculation of differences between baseline and intervention data in completers showed a positive intervention effect ($p < 0.001$) with a median increase of 223 MET-minutes/ week.
 - This equates to approximately 75 minutes of additional brisk walking/week (N=1051).
- 59.9% of completers who were sedentary or lightly active at baseline achieved CMO recommended guidelines at intervention.
- 80.3% of sedentary and 63% of lightly active completers moved forward at least one activity category.

Change in Physical Activity by Theme

Exercise Referral

- 67.6% of completers who were sedentary or lightly active at baseline achieved CMO guidelines at intervention (N=460).
- 80.4% of sedentary completers at baseline progressed to become lightly, moderately or highly active at intervention.

Classes and Groups

- Overall a median difference (baseline versus intervention) for completers in classes and groups (N=464) showed a negative intervention effect of 36.9 MET-minutes/week. For adult completers, an overall median difference of +30 MET-minutes/week was found.
- 50.7% of completers sedentary or lightly active at baseline achieved CMO recommended guidelines at intervention.

Economic Analysis

- The cost (£) per QALY gained from interventions ranges from c£50 to c£510 which suggests LEAP interventions were value for money (VFM). It was not possible to identify trends between VFM and interventions types.

This section reports on the following findings:

- Caveats to the findings.
- Engagement of participants in LEAP.
- Sample size.
- Demographic profiles of LEAP participants.
- Effect of LEAP on overall physical activity levels.
- Overall physical activity change and defining demographic characteristics.
- Overview of physical activity change across the themes.
- Physical activity change across the themes and defining demographic characteristics.
- The effect of LEAP themes on engagement and change in physical activity.
- Economic analysis.
- The Ipsos MORI community survey.

The Caveats with the Evaluation

The findings of the evaluation should be viewed with the following caveats in mind:

- A snap shot of a participant's typical weekly physical activity behavior was taken. Physical activity was measured before then during the intervention period, for comparison to pre-intervention. Where multi-weeks were assessed in this period (maximum of 4), averages were taken. It is worth noting that participant attrition would have occurred over a longer intervention measurement period.
- The LEAP intervention period was a relatively short period of time. Higher participant attrition would have occurred over a longer timeframe.¹⁷
- Seasonal variations which are known to influence participation rates particularly among children and older adults will have influenced the timing of both the intervention and the data capture process for the case study, where it was

¹⁷ Buckworth & Dishman (2002) indicate that 50% of participants who initiate a programme of physical activity will cease to do so within 6-9 months.

necessary to collect data at different times in the year. The community survey was carried out at the same time of year before and then after most of the interventions had been completed. Some interventions in this sample continued after intervention data had been collected

- From our communications with staff working in the sites, we know some participants engaged and completed the interventions, but did not engage or complete the evaluation of LEAP. This evaluation reports on the outcomes of participants who engaged and/or completed the LEAP evaluation.¹⁸
- There was a high level of attrition in the sample. Participants who provided both a baseline and intervention physical activity data account for as little as approximately 10% of all participants who engaged LEAP interventions, and approximately 20% of participants who engaged the evaluation of LEAP. Therefore there is a potential self selection bias. It is possible that those participants who completed LEAP interventions and who provided both baseline and intervention physical activity data differ from those participants who (i) dropped out, and/or (ii) did not provide data for the National Evaluation.
- In response to concerns over potential self selection bias, it is worth noting that a cross tabulation was undertaken of the physical activity behavior based on a sample of 1051. These participants contributed both baseline and intervention physical activity data and analyses identified participants who demonstrated physical activity behavior across a spectrum of 'change'. Participants were found to have progressed, regressed and maintained their physical activity category. In this report participants are referred to as a 'completer' where they provided (i) a baseline and an intervention measure for physical activity or (ii) where they provided an intervention measure that was compared with baseline measure to demonstrate the effect of the LEAP programme on overall physical activity levels.

¹⁸ With the exception of campaigns and directories.

- Given that the sample of 'completers' represented as little as 10% of the overall participant numbers; we did not conduct intention-to-treat analysis. Comparing the 90% [assumption of no change] with the 10% [possibility of change] highlights the impossibility of detecting any real positive effects. Intention-to-treat is best adopted where researchers can ensure high levels of compliance to a research protocol (which includes completing questionnaires and diaries). Where this is not always possible – as in LEAP – effective interventions are always disadvantaged. Further, 'no effect' outcomes are subject to Type II error, the error of failing to accept an alternative hypothesis. This might be due to factors such as sample size or composition.
- Small sample sizes in some interventions limit the generalizability of the results.
- Not all participants provided data on demographic profile. Whilst these analyses were undertaken, there was no attempt to control for any covariates since this would have reduced the sample size still further.
- The data provided reflect participants' self-report. More specifically:
 - Individuals often over-report their level of physical activity. Local evaluators expressed that the IPAQ tool often led to a degree of 'over reporting'.
 - Children, young people and older adults have difficulty in accurately recalling physical activity behaviour.
 - Participants who provide evaluation data may have already been engaged in physical activity and physical activity interventions. As such they may be more motivated than others to participate in LEAP and the evaluation.
 - Practitioners have a vested interest in showing the success of their interventions and may over-estimate the intervention effect.
- In community delivery it has not been possible to control for factors that may have influenced behaviour. Factors beyond the LEAP interventions, such as individual and environmental influences and capacity to become active, also contribute to the intervention effects reported here.

4.1.1 Engagement of Participants in LEAP

Figure 1 Appendix 1 depicts participant engagement in the different stages of the National Evaluation of LEAP. Excluding involvement in campaigns and directories, a total of 10,433 participants engaged in LEAP. Of these, 5324 participated in the National Evaluation. This is approximately 50% of the total number of participants who engaged LEAP interventions (excluding campaigns and directories). Collecting data for the National Evaluation was beset by difficulties and **Appendix 1** provides this detail. It is likely that these difficulties contributed to both the sample size and the completeness of the data collected. These difficulties explain the variation in the sample size throughout the findings section of the report.

4.1.2 Sample Size for the National Evaluation.

Demographic data are available for 9 sites¹⁹ and for 5324 participants who consented and engaged in the National Evaluation. These participants were issued with a LEAP identification reference number.

4.1.3 Demographic Profile of Participants who Engaged LEAP

Figure 1: Distribution of gender/age (N=4835), illustrates the age, gender and priority groups that LEAP engaged. LEAP engaged young people, including young girls/ women, older adults including women, and men and women 75+. Adult women were engaged more than adult men often in a 2:1 ratio. As such sites that targeted these groups were effective in reaching their intended audiences.

¹⁹ Dudley withdrew from the substantive part of the National Evaluation in April 2005.

Figure 1: Distribution of gender by age categories

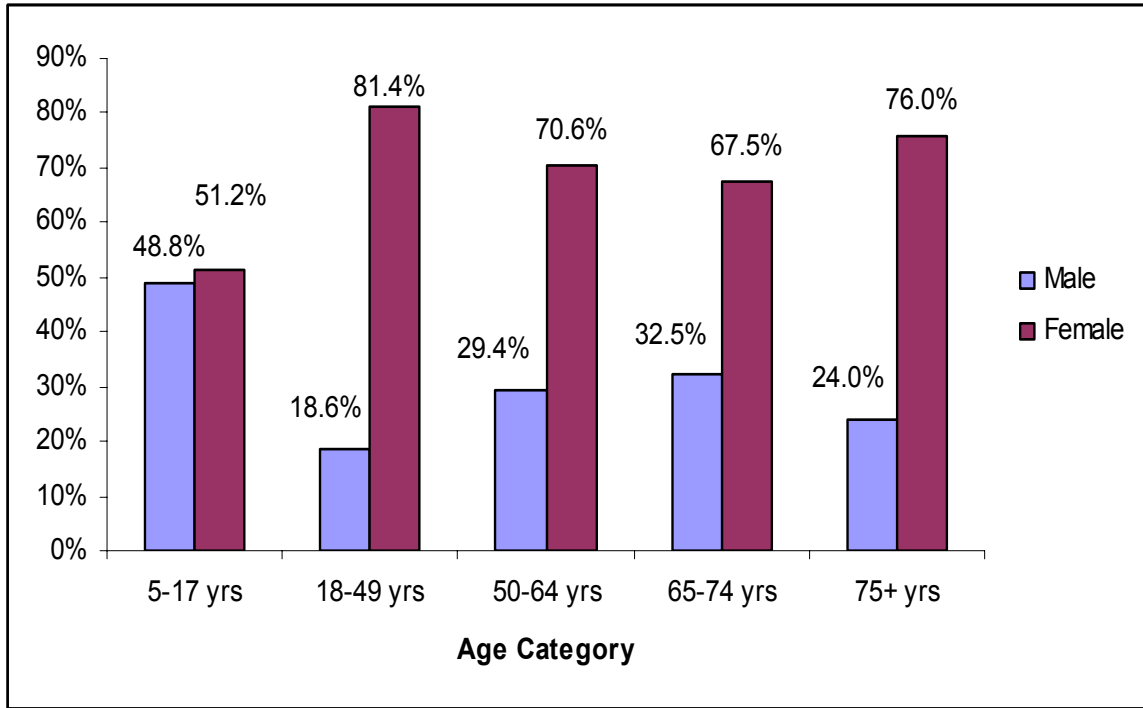


Figure 2: Ethnic distribution. Ethnicity was reported by 5202 participants. LEAP engaged mainly white British participants, although BME participants were engaged through LEAP. Problems were encountered in engaging BME participants in the evaluation (**Appendix 1**). Therefore, these figures are likely to under-represent the scale of BME engagement with LEAP.

Figure 2: Ethnic distribution

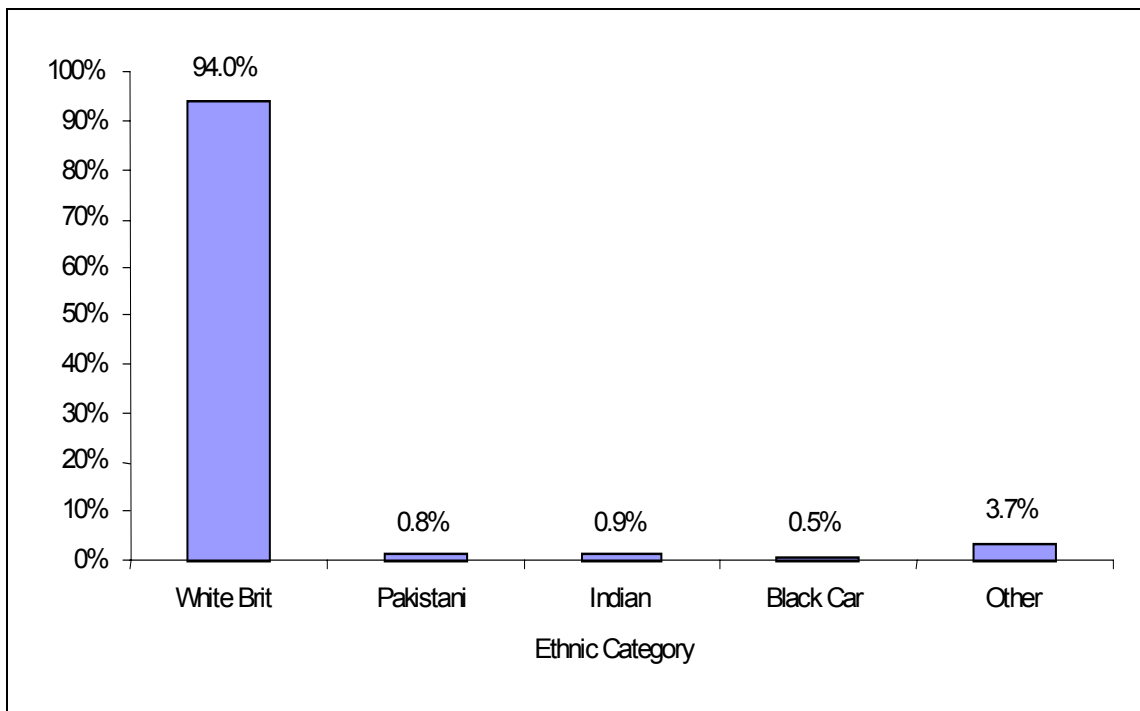
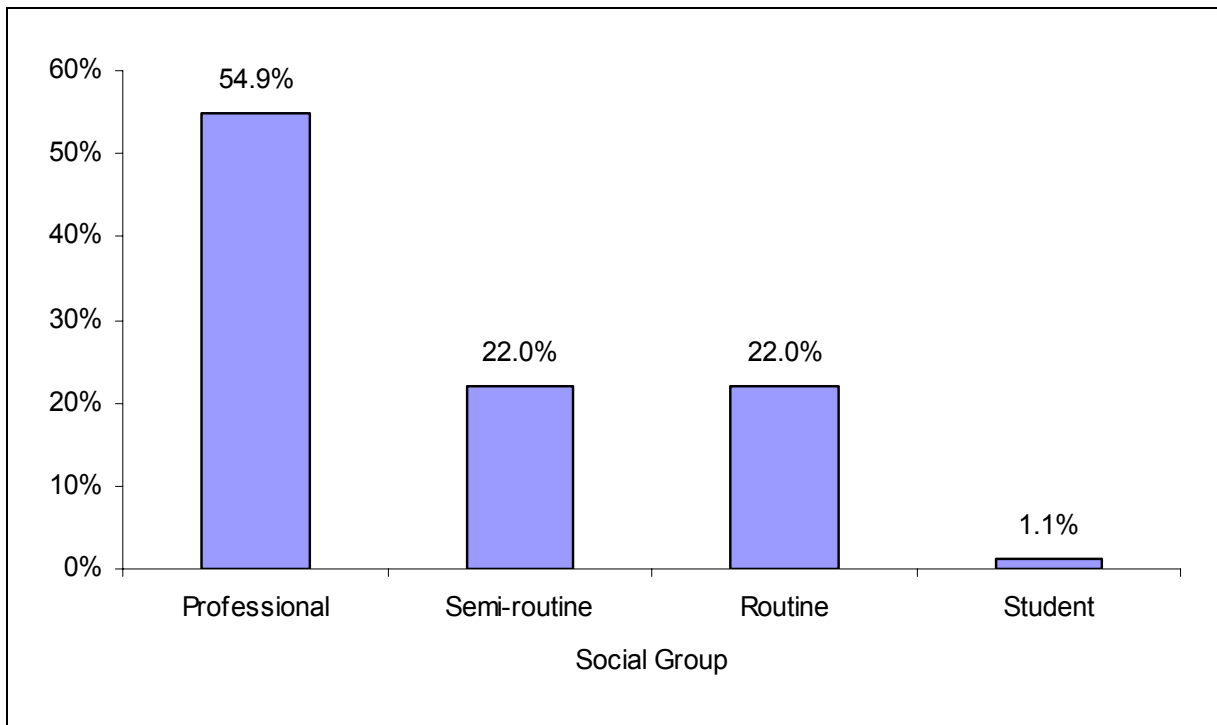


Figure 3 illustrates the different social groupings engaged by LEAP (N=2646). LEAP mainly engaged participants from professional groups. Owing to difficulties discussed in **Section 3** in collecting data from participants in different social groups leading to nil returns, social grouping was collapsed into 4 groups.

Figure 3: Social Grouping



4.1.4 The Effect of LEAP on Overall Physical Activity Levels

Key analyses involved those participants with baseline and intervention data (N=1051). This is approximately 10% of the 10433 participants who engaged LEAP interventions (excluding campaigns and directories).

Calculation of differences between baseline and intervention data showed a positive intervention effect ($p < 0.001$) with a median increase of 223 MET-minutes/week (IQR = 1343 MET-minutes/week) for completers. This equates to approximately 75 minutes of additional brisk walking/week.

Comparisons of baseline and intervention activity categories showed maintenance or positive change in moderate physical activity (MPA) for the majority of completers (79.4%). Importantly, 59.9% of completers who were classified as either sedentary or lightly active at baseline achieved CMO recommended guidelines at intervention.

Table 4 shows that increases in physical activity were particularly evident among completers classified as sedentary or lightly active at baseline. 80.3% of sedentary and 63% of lightly active completers moved forward at least one activity category.

Table 4 illustrates the change in physical activity category of completers on LEAP overall.

**Table 4: Cross tabulation of pre-intervention and intervention activity categories:
Overall**

Total sample size = 1051			Intervention			
			Sedentary	Lightly Active	Moderately Active	Highly Active
Baseline	Sedentary (n=91)	Count Row %	18 19.8%	29 31.9%	18 19.8%	26 28.6%
	Lightly Active (n=340)	Count Row %	25 7.4%	101 29.7%	109 32.1%	105 30.9%
	Moderately Active (n=307)	Count Row %	9 2.9%	78 25.4%	108 35.2%	112 36.5%
	Highly Active (n=313)	Count Row %	8 2.6%	32 10.2%	64 20.4%	209 66.8%

37.9% of completers moved up at least one activity category from baseline to intervention
 41.5% of completers maintained their activity category from baseline to intervention
 20.6% of completers reduced their activity category from baseline to intervention

The trend shows an overall increase in physical activity participation. This is also supported by examining the 'median' physical activity data. Median values.²⁰ were identified for baseline activity in 2783 participants in nine sites. A median value of 780 MET-minutes/week (IQR = 1260 MET-minutes/week; equivalent to moderately active) was found for baseline data. **Figure 4 (Appendix 4)** indicates the majority (60.2%) of participants engaged in LEAP were already meeting the CMO recommendations at baseline. However LEAP also engaged participants (39.8%) not meeting the CMO's recommended guidelines.

- From nine sites median values were identified for the 1521 completers with usable intervention physical activity data. **Figure 5 (Appendix 5)** shows that, following intervention, 70.5% of completers were achieving CMO recommended guidelines (i.e., were moderately or highly active). This

²⁰ The median refers to a value of central tendency less susceptible to poor distribution of data when taken at two different time points and used to establish physical activity patterns at baseline and intervention. These values were then compared to evaluate overall physical activity change. This analysis includes some participants who did not provide an intervention measure.

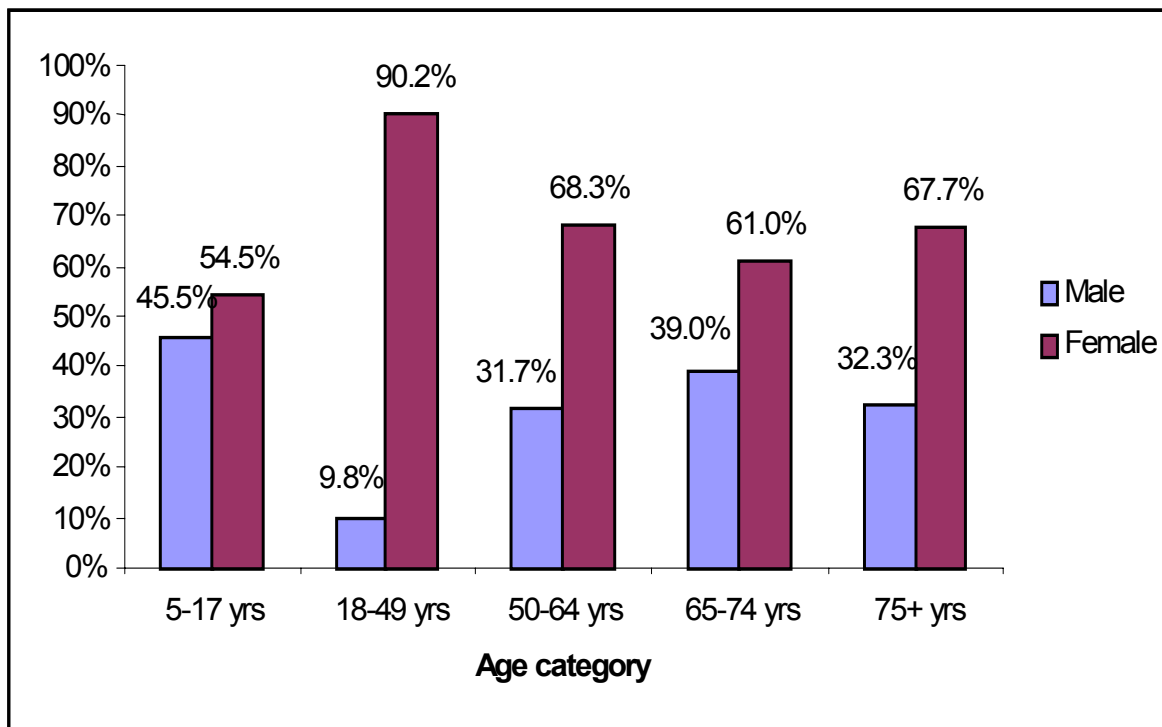
represents a median value of 1260 MET-minutes/week (IQR = 1410 MET-minutes/week; equivalent to highly active).

Comparing baseline (N=2783) to intervention (N=1521) physical activity data showed an increase in the percentage of completers achieving CMO recommended guidelines (+10.3%), a median increase of 480 MET-minutes/week. These data suggest that LEAP had an initial positive effect on overall physical activity levels in completers. These data support a general positive trend or increase in physical activity participation. This outcome is exemplified in completers not meeting CMO recommendations at baseline, but who achieved guidelines at intervention.

4.1.5 Overall Physical Activity Change and Defining Demographic Characteristics

These demographic analyses reflect completers (N=1051).

Figure 6: Gender distribution relative to age for participants with baseline and intervention activity data



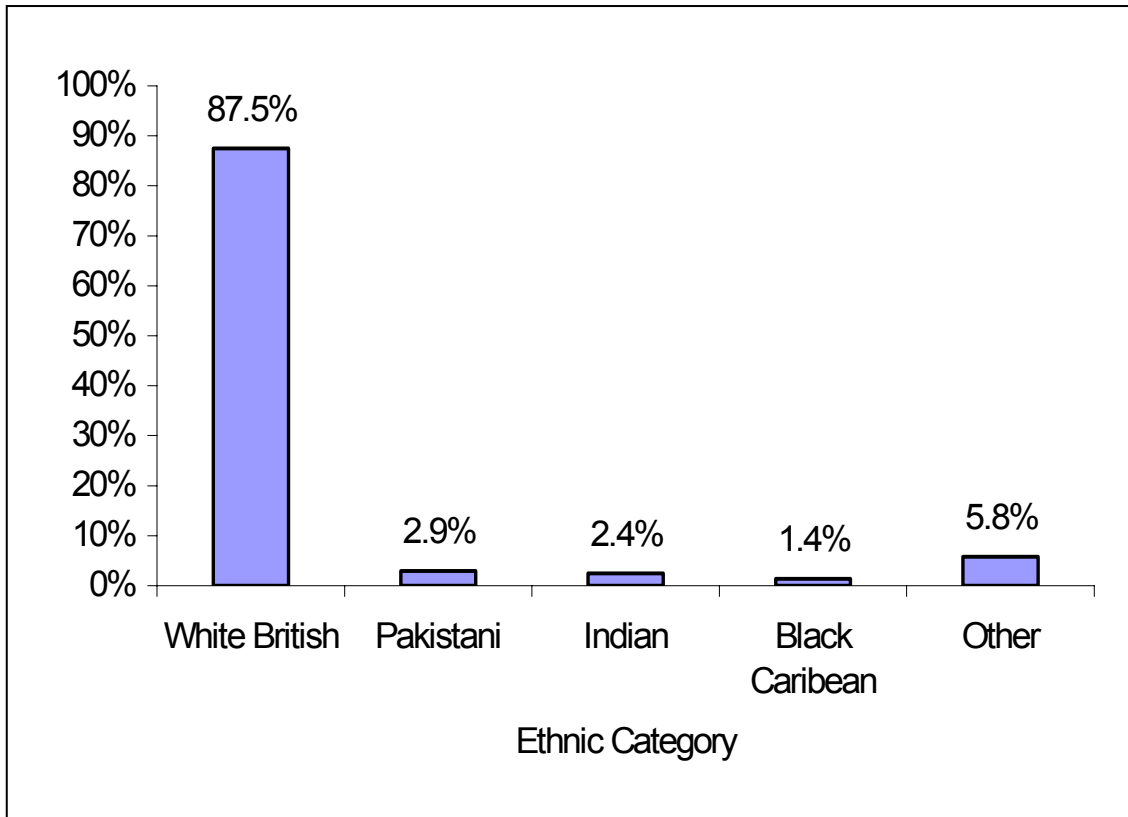
Female completers over 50 years of age represent the largest demographic group to contribute both baseline and intervention physical activity data.

The extent of change with regard to age and gender

The extent of positive change (sedentary or lightly active completers at baseline, becoming moderately or highly active at intervention) was broadly equivalent for gender (male completers 66.3%; female completers 55.7%). While 42% (N=178) of young people reported a positive exercise effect, this was the lowest percentage of positive change for any age category. Other values ranged from 48% (N=25) for older adult completers 75+ to 84% for adult completers (N=25).

Figure 7 illustrates the ethnic distribution for participants with activity data

Figure 7: Ethnic distribution for participants with baseline and intervention data



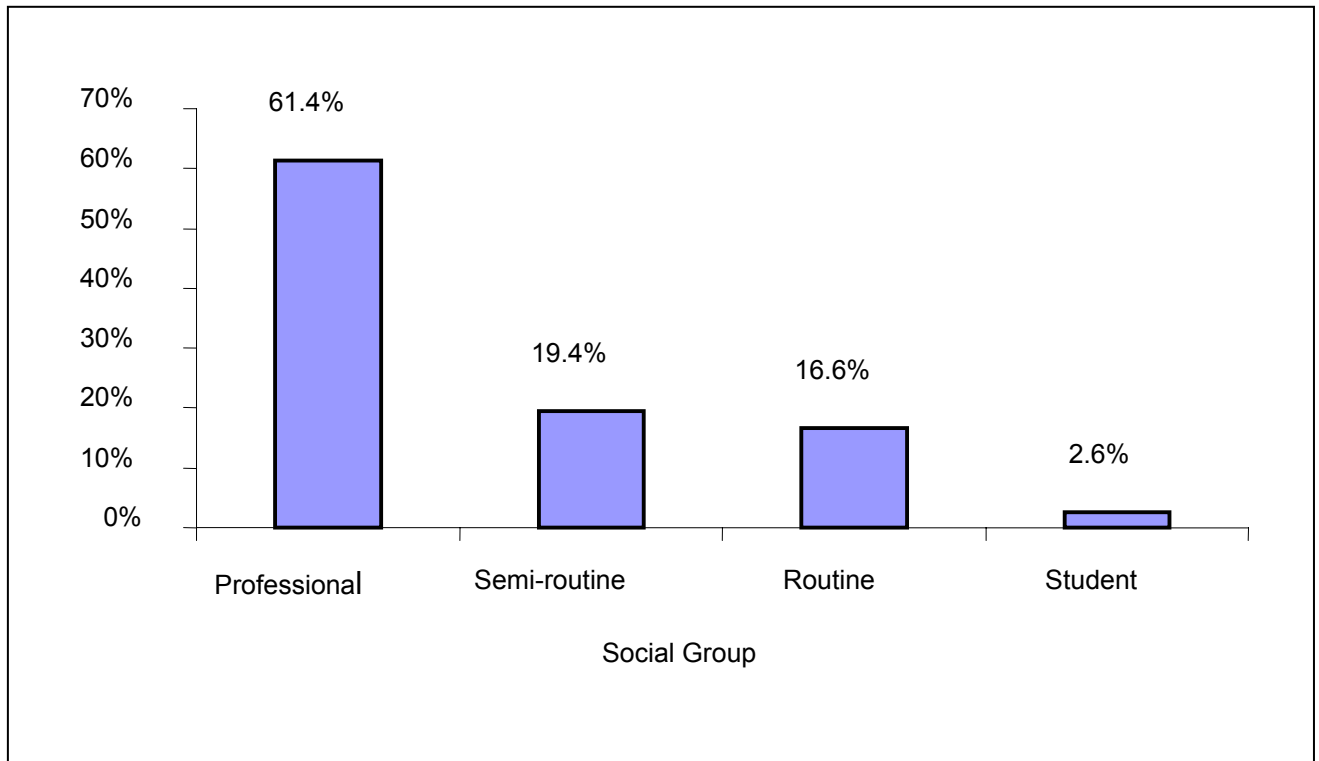
White British completers represent the largest demographic group to contribute both baseline and intervention physical activity data.

The extent of change with regard to ethnicity

The extent of positive change for completers (sedentary or lightly active at baseline, becoming moderately or highly active at intervention) relevant to ethnic origin ranged from 85.7% for ethnic minorities (N=56) to 61.9% for white British completers (N=318).

Figure 8: illustrates the social grouping for participants with baseline and intervention physical activity data

Figure 8: Social grouping for participants with baseline and intervention data



The extent of change with regard to social grouping

A minimum of 1 in 2 completers reported positive change (sedentary or lightly active at baseline, becoming moderately or highly active at intervention) with regard to social grouping. For completers in semi-routine occupations, positive change was reported by 50% (N=54). For completers in lower managerial and professional occupations the figure was 74.6% (N=126), 79.4% for routine occupations (N=61) and 85.7% for full-time students (N=13).

Conclusion

Although the majority of participants in LEAP were already meeting the CMO recommendations at the start of the interventions, a general increase in physical activity occurred at intervention. This effect was particularly evident in completers not meeting the CMO recommended guidelines at baseline. LEAP interventions also demonstrated effectiveness in engaging a range of physical activity priority groups.

4.2 Overview of Physical Activity Change across the Themes

The following themes provided participants with both baseline and intervention physical activity data i.e. completers:

- Exercise referral (N=460).
- Classes and groups (N=464).
- Campaigns and directories (N=42).
- Motivational interviewing (N=77).
- Outdoor outdoors and transport (N=8).

No valid physical activity data were available for peer mentoring or training physical activity leaders due to difficulties in capturing this data ([Appendix 1](#)).

- Calculation of median differences (baseline versus intervention) showed a negative intervention effect for completers in classes and group -36.9 MET-minutes/week (N=464; IQR = 1505 MET-minutes/week), but positive intervention effects for completers in:
 - Exercise referral +405 MET-minutes/week (N=460; IQR = 1211 MET-minutes/week).
 - Motivational interviewing +360 MET-minutes/week (N=77; IQR = 864 MET-minutes/week).

- Campaigns and directories +150 MET MET-minutes/week (N=42; IQR = 951 MET-minutes/week).
- Outdoors and transport +810 MET-minutes/week (N=8; IQR = 1198 MET-minutes/week).

This represents additional weekly activity in the range of 50-270 minutes/week of brisk walking. Comparing baseline and intervention activity categories showed that maintenance (sedentary participants excluded) or positive MPA change was reported by at least 4 in 5 completers:

- Exercise referral (86.4%).
- Campaigns and directories (90.4%).
- Motivational interviewing (93.5%).
- Outdoors and transport (87.5%).

The percentage of completers sedentary or lightly active at baseline, achieving CMO recommendations at intervention were as follows;

- Exercise referral 67.6%.
- Classes and groups 50.7%.
- Campaigns and directories 75%.
- Motivational interviewing 86.2%.
- Outdoors and transport 100%.

4.3 Defining Demographic Characteristics across the Themes

Owing to the low numbers of participants in some themes and as not all participants provided data on demographic profile, the extent of positive change relative to demographics was only evaluated for age and gender for completers within exercise referral and classes and groups. To help with identifying the impact of the themes, demographic profile is reported here. Discussion in conjunction with other findings is located in **Section 4.4**.

Figure 9 illustrates the distribution of age categories across the different LEAP themes. It also illustrates that LEAP themes engaged the established age related physical activity priority groups.

Figure 9: Distribution of age categories by themes

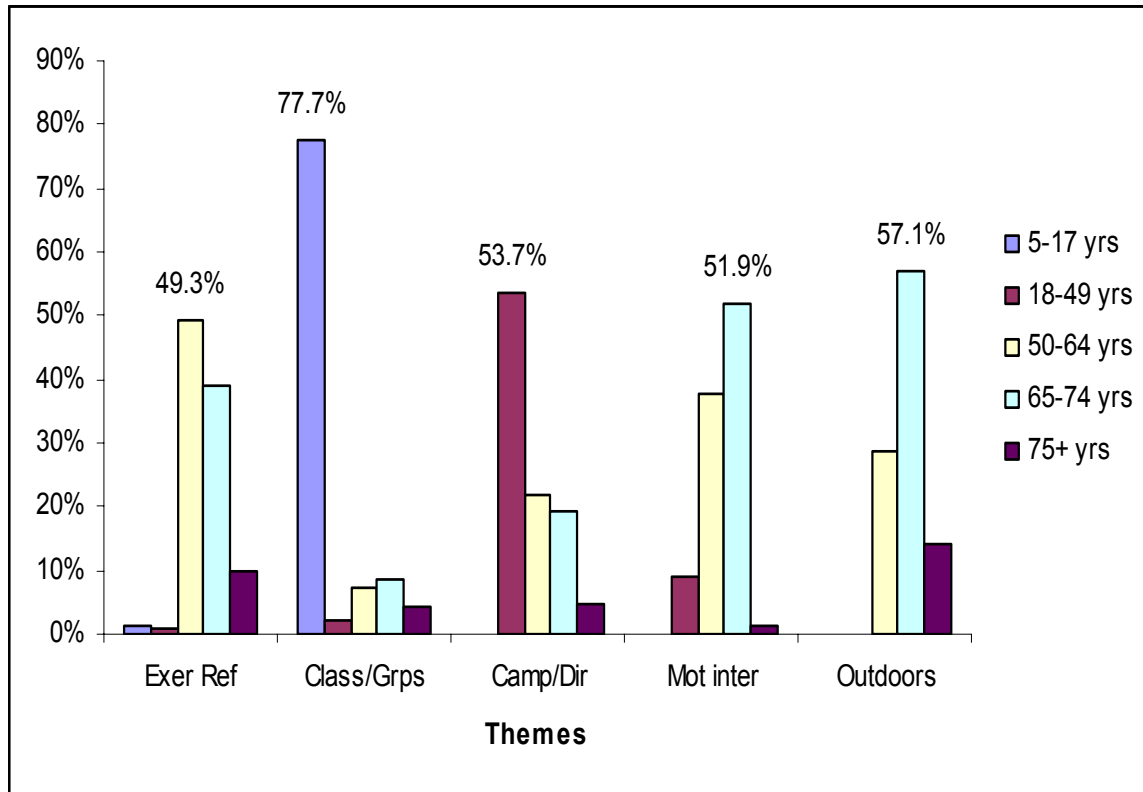


Figure 10 illustrates the distribution of gender categories across the different LEAP themes

Figure 10: Distribution of gender by themes

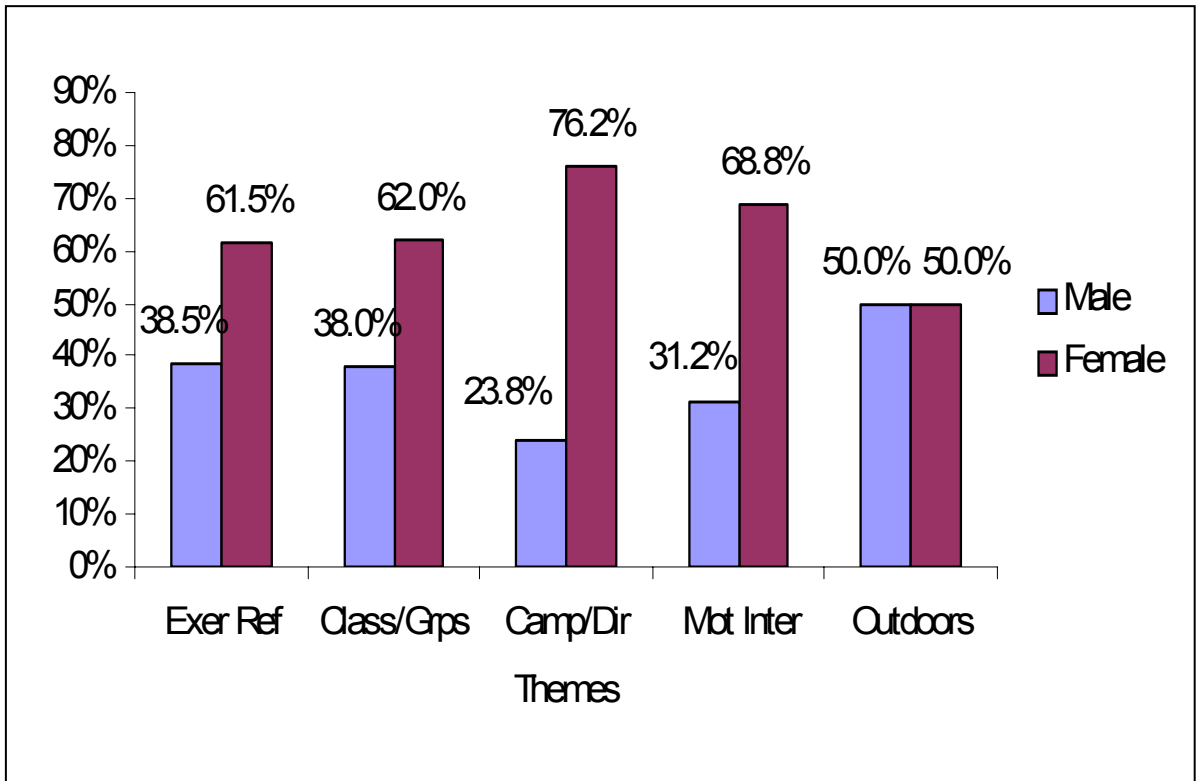


Figure 11 illustrates the distribution of ethnicity across the different LEAP themes.

Figure 11: Distribution of ethnicity by themes (percentages given for largest ethnic grouping)

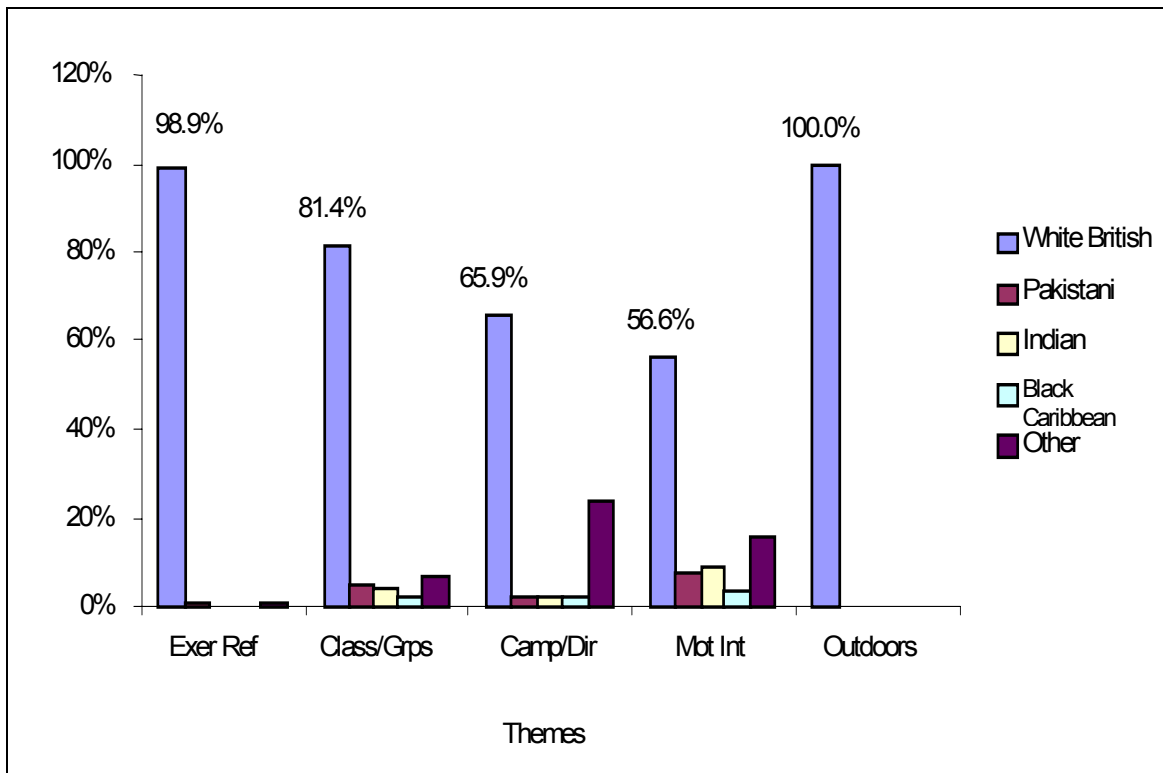
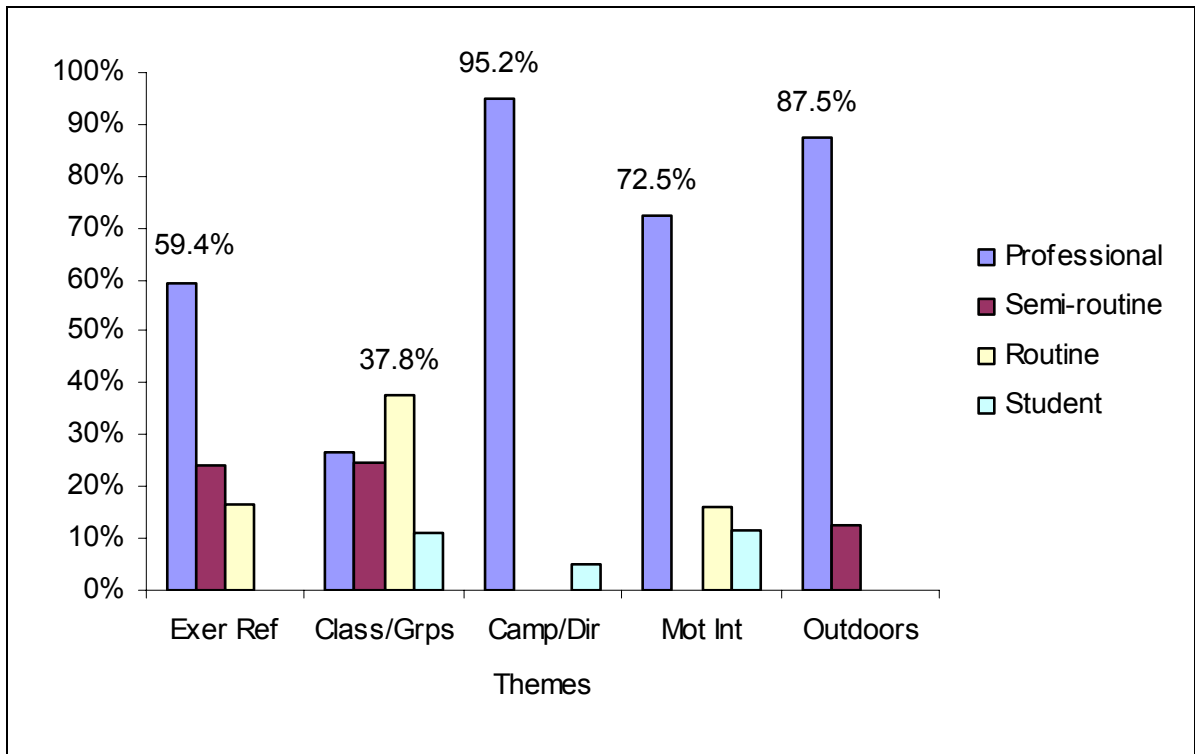


Figure 12 illustrates the distribution of social grouping across the different LEAP themes.

Figure 12: Distribution of social group by themes (percentage given for largest social grouping)



4.4 The Effect of LEAP Themes on Engagement and Change

Data provided by participants and by practitioners has been triangulated with other data sources to help understand the impact of the intervention themes. With no capacity to standardise delivery, differences within the design and delivery of the themes are likely to have contributed to effects on physical activity engagement and increases in physical activity participation. This point is reflected by intervention theme in the main text and through selected participant and intervention case studies.

4.4.1 Exercise Referral

Table 5 illustrates the cross tabulation of baseline and intervention activity categories for exercise referral. The table shows the progression/regression of physical activity category for completers.

Table 5: Cross tabulation of pre-intervention and intervention activity categories: Exercise Referral

Total sample size = 460			Intervention			
			Sedentary	Lightly Active	Moderately Active	Highly Active
Baseline	Sedentary (n=56)	Count Row %	11 19.6%	17 30.4%	6 10.7%	22 39.3%
	Lightly Active (n=117)	Count Row %	7 6.0%	21 17.9%	31 26.5%	58 49.6%
	Moderately Active (n=115)	Count Row %	2 1.7%	12 10.4%	28 24.3%	73 63.5%
	Highly Active (n=172)	Count Row %	4 2.3%	8 4.7%	28 16.3%	132 76.7%

45% of completers moved up at least one activity category from baseline to intervention

41.7% of completers maintained their activity category from baseline to intervention

13.3% of completers reduced their activity category from baseline to intervention

Further to that:

- 67.6% of completers who were sedentary or lightly active at baseline achieved CMO guidelines at intervention.
- 80.4% of completers sedentary at baseline became lightly, moderately or highly active at intervention.

Exercise referral engaged more men (**Figure 10**) than any other LEAP intervention. Older adults predominated, especially those aged 65-74 and 75+ (**Figure 9**). Participants from BME (**Figure 11**) and participants from routine socio-economic groupings were also engaged (**Figure 12**). This indicates that LEAP sites that targeted these groups were successful in engaging their intended audience(s).

Higher rates of positive change were found for male (81.5%) than female completers (55.4%). (**Figure 10**). In the qualitative data, 3 co-ordinator practitioners from 3 sites indicated there was an increased level of physical activity among participants referred with disease risk factors and conditions. The effect of exercise referral is reflected in [participant case study 1](#).

Participant case study 1: Exercise referral for adults/older adults with disease risk factor in community based exercise facilities

- In this exercise referral intervention sedentary adults and older adults indicated that they had engaged in physical activity and had reduced the effect of their disease risk factors following the intervention. The sample of 8 adults and 4 older people self reported positive feelings of mental and physical wellbeing, which contributed to their reported adherence in the intervention. One 59 year old male participant expressed the following feelings:
 - *“The exercise just makes me feel better. It’s improved my appetite and my sleeping as well, and I have much greater self esteem and independence.”*
 - One 80-year-old female participant indicated that:
 - *“I did exercises at home to start with and the activity leader suggested going to the swimming pool, which the doctors thoroughly agreed with, I enjoy it very much, I get out of the house...I feel happier through going, it’s lovely and I really enjoy it.”*
 - The role of the exercise leader was important in promoting participation. One female participant indicated:
 - *“It’s been magic yes. I couldn’t have improved on my own without the help, it’s been so different, I can’t thank the (exercise referral practitioner) enough.”*

The design characteristics of exercise referral interventions are likely to be important factors in contributing to engagement and increases in physical activity levels. These are reflected in [intervention case study 1](#).

Intervention case study 1: Exercise referral for adults and older adults with risk factors for diabetes run in community exercise facilities.

In this intervention:

- Partnerships were developed with motivated and committed nurse specialists and physicians who came into contact with and engaged participants with diabetes and related conditions. Practitioners assessed participant's ability to become active using a stage matched tool and referred participants to the exercise intervention in the optimum readiness to become active. Intervention staff followed-up these individuals by telephone or by mail in between the referral being made and them starting the intervention.
- A simple referral protocol (i.e., with only a limited number of stages) was designed in collaboration with nurse specialists and mapped out the conditions for which a person could be referred. This approach helped to minimise numbers of refused referrals.
- Previous outreach work had been conducted with participants and partners from specialist diabetes clinics. This allowed intervention staff to speak with participants before they started which helped to manage anxieties and raise participant awareness of services. When participants first attended, they were reassured by knowing at least one 'friendly face'.
- Client-centred and one-to-one approaches helped to identify and understand the different needs of priority groups. These needs included addressing access, safety, fear and social support. They effectively and sensitively communicated and built rapport with adults and older adult participants.
- Trained and skilled staff adapted and tailored a range of exercise programmes to address personal barriers. Working with participants to identify and agree activity targets and solutions of how to become active was effective. This was achieved through simple and practical guidance. Links were made to a range of exit opportunities, which participants felt would help them to continue to meet recommended guidelines for physical activity.

The design characteristics of interventions are likely to have contributed to outcomes on participant engagement and increases in physical activity levels of completers. The extent to which exercise referral interventions in the community setting are effective in sustaining levels of increased physical activity participation over longer time frames requires further investigation. Within an initial intervention period, exercise referral was effective in engaging and facilitating an increase in the physical activity levels of adult and older adult completer not meeting the recommended guidelines.

4.4.2 Classes and Groups

Table 6 illustrates the cross tabulation of baseline and intervention activity categories for classes and groups. The table shows the progression/regression of physical activity category for completers engaged in this theme.

Table 6: Cross tabulation of pre-intervention and intervention activity categories: Classes and Groups

Total sample size = 464			Intervention			
			Sedentary	Lightly Active	Moderately Active	Highly Active
Baseline	Sedentary (n=33)	Count % within baseline	7 21.2%	11 33.3%	12 36.4%	3 9.1%
	Lightly Active (n=180)	Count % within baseline	18 10.0%	74 41.1%	65 36.1%	23 12.8%
	Moderately Active (n=164)	Count % within baseline	6 3.7%	64 39.0%	70 42.7%	24 14.6%
	Highly Active (n=87)	Count % within baseline	4 4.6%	24 27.6%	29 33.3%	30 34.5%

29.7% of completers moved up at least one activity category from baseline to intervention
 39% of completers maintained their activity category from baseline to intervention
 31.3% of completers reduced their activity category from baseline to intervention

Based on median difference (Baseline versus Intervention), completers in classes and groups showed a negative intervention effect, -36.9 MET- minutes/week. However compared with baseline, completers progressed their physical activity category at intervention. This includes those not meeting recommended guidelines (Table 6). Further to this:

79.1% of sedentary completers became lightly, moderately or highly active at intervention.

50.7% of completers sedentary or lightly active at baseline became moderately or highly active at intervention.

The majority of completers involved in classes and groups were children and young people (77.7%), notably females (Figure 9) and from a “routine” social grouping (37.8%) (Figure 12). This can be partially explained by LEAP sites targeting classes and group interventions at young people including young women (Table 2). The participation of young people in this intervention and the problems associated with measuring their physical activity (McKenna et al., 2004), are likely to have contributed to the overall negative intervention effect.

To identify an intervention effect for different groups of completers, analysis of classes and groups for adults was undertaken. This aimed to establish differences in the level of overall level of change between adult completers and completers who were young people. These analyses indicated a median difference of +30 MET- minutes/week within classes and groups for adult completers (22.3%). Data then indicates a small, but positive intervention effect in increasing the physical activity levels of this group within an initial intervention period. In a sample of interviews, 5 LEAP co-ordinators and practitioners from three sites indicated that classes and groups had engaged inactive adults. In 3 sites a sample of 10 practitioners reported

that older adult participants had been engaged and increased their physical activity levels. Demographic data indicate that participants from BME (Figure 11) were also engaged.

With the caveats of data capture in mind, quantitative and qualitative data offers cautious support for the positive effects of classes and groups in engaging and initially facilitating an increase in physical activity levels in adults. In some cases participants met the recommended physical activity guidelines. Given the diverse range of activities that fall within this theme, further research is required to investigate the effectiveness of specific types of classes and groups in engaging adults and facilitating increases in physical activity participation in line with the CMO guidelines. This should be undertaken for a longer time frame to that used in this evaluation and with a larger sample size. The use of effectively designed pilot projects with an evaluation will help facilitate this investigation.

The majority of completers involved in classes and groups were children and young people (77.7%). Measuring physical activity in young people is a particular challenge and the literature has indicated there are problems with recall and accurate reporting (McKenna, et al. 2004, Cooper, 2003). The use of self-report measures with children is not as reliable as with adults. The extent to which this assessment method accurately assessed variations in baseline and intervention activity volume may have resulted in or contributed to a negative intervention effect, -36.9 MET-minutes/week. The small sample of 'complete data' provided by young people, as well as the dynamic nature of young people's activity, parental control and dynamic leisure time choices are factors likely to have influenced the overall intervention effect. Classes and groups included a diverse range of individual interventions. The difficulties associated with capturing data in some of these projects may have contributed to the overall effect on physical activity levels in this theme. Considering data on progression through the physical activity categories,

(Table 6) 50.7% of completers who were sedentary or lightly active at baseline became moderately or highly active through the intervention. This offers some support for the potential role of this theme within an initial intervention period in engaging and facilitating small increases in the physical activity levels of completers.

It is helpful to triangulate this data with that collected through the other elements of the National Evaluation. Qualitative physical activity data from participants and practitioners offers support for the effectiveness of classes and groups in initially engaging young people not already meeting the CMO guidelines. Among practitioners who were interviewed, 10 felt that interventions helped sedentary young people increase their level of physical activity levels some to recommended guidelines. Others achieved health-related benefits and made positive changes in other health-related behaviours such as healthy eating. A sample of young people indicated that attending the intervention helped to address their low levels of activity. Questionnaire and focus group data was collected from 51 participants at 4 sites. These data indicated that interventions helped address common barriers including lack of confidence and competence, low self-efficacy, fear of failure and concerns over physical appearance. A number of participants indicated they were introduced to new non-sporting physical activities through LEAP. The effect of classes and groups with young people is reflected in [participant case study 2](#).

Participant case study 2: Camps, classes and groups for young people in school and community settings

- 112 inactive young people some with health problems engaged in specialist outdoor activity (OA) classes and groups. A sub-sample of 12 participants highlighted that the intervention had been a positive experience, and for most it was their first experience of OA in the countryside. A number indicated that they had lost interest in traditional sport and PE and so had not been taking part in physical activity, but that the intervention had opened up new opportunities to them. Out of the original 112 involved in the intervention, 50 were involved in exit physical activity programmes occurring in the local community 3 months after the initial intervention.
- One male participant said:
 - *"Before camp I was kind of like lazy and didn't want to do sports much. I wasn't really interested, but now I kind of like sports."*
- Another male participant said:
 - *"I do more like walking now, like uphill and things like that. I seem to have a more like adventurous side. Before in school I used to be shy, I would just get on with my work, but now I kind of have a rapport with my friends and that like before I wouldn't. I feel more like open and I could be myself more it also helped me make lots of friends from other parts of the Dale."*
- Thirty took part in mountain biking and 21 took part in an 8-mile countryside walk one year after the initial intervention. Ten practitioners including 8 from partners supporting this intervention indicated that participant's physical activity level had met recommended guidelines following the initial OA intervention.

The design characteristics of classes and groups interventions are likely to be important factors contributing to engagement and increases in physical activity levels. These are reflected in [intervention case study 2](#)

Intervention case study 2: Classes and groups for young people in school and community facilities

In this intervention:

- Obtaining a good 'fit' with local policy more speedily engaged supportive partners and working with other gatekeepers helped engage initially reluctant partners. Good 'fit' with local policy helped to secure:
 - Extra resources including free use of facilities.
 - Access to young people's groups and staff with a range of skills for setting up and running interventions.
 - Daily contact with colleagues who regularly interacted with priority groups.
- Being able to link with new and pre existing programmes provided participants with obvious exit strategies.
- All of these factors contributed to establishing new interventions to engage young people, some with disease risk factors.
- Through effective pre-planning, sites took time (and often several attempts) to recruit dedicated and appropriately skilled staff who:
 - Understood the needs of groups and could build positive working relations with them. One male participant in an exercise class indicated:
 - *"The class made me feel more like open and I could be myself more."*
 - Had established networks within these communities, typically through undertaking other outreach work.
- Effective yet common practice involved young people in shaping exit opportunities, which made it more likely for them to engage in future physical activity. Active involvement of participants in the development, delivery and ongoing improvement of exit interventions also helped provide information to shape longer-term provision. Building capacity for future participation was an outcome and one male participant indicated:
 - *"You're more confident in PE because you've done loads of stuff and like, before you didn't like doing stuff in front of people but now... you feel more confident."*

LEAP evidence indicates that within an initial intervention period, exercise classes and groups engage and help facilitate increases in the physical activity levels, including completers not meeting CMO guidelines at baseline. Design characteristics of interventions are likely to have contributed to such outcomes. Further investigation is required to identify the longer-term effectiveness of classes and groups in helping participants maintain recommended guidelines for physical activity to the time frame used in this evaluation. Consideration should be given to the evaluation methodology to widen sample sizes and the choice and application of data collection tools.

4.4.3 Motivational Interviewing (MI)

Calculation of median differences (baseline versus intervention) showed a positive intervention effect of +360 MET-minutes/week (N=77). 86.2% of completers (involved in motivational interviewing who were sedentary or lightly active at baseline achieved the CMO recommended levels of physical activity at intervention. 89.3% of completers (n=28) who were lightly active at baseline achieved CMO recommended guidelines at intervention. The small sample size is a caveat with this finding. Motivational interviews engaged more females than males including older adults (**Figure 10**) as well as participants from BME (**Figure 11**).

Experiential data also supports the numerical data on engagement and physical activity levels. Three practitioners from 2 sites indicated that adults and older adults including BME had been engaged through motivational interviewing. In one of these sites, 113 participants (77 female) attended an average of six MI sessions, coming from areas described as the 'most deprived wards' in the area. The effect of MI is reflected in [participant case study 3](#)

Participant case study 3: MI intervention for adults with disease conditions in community venues

- In a participant case study, a previously inactive attendee indicated that they had increased their level of physical activity. One male participant had been referred to the intervention by their GP.

"I was on a routine visit to my hospital for my Arthritis and I asked my GP how he had lost weight and he said he had been going to the gym twice a week. I said that I would like to do something like that, so he provided me with some information about the clinics [MI sessions] and I asked if it was ok for my wife to come and he said yes and so we went."

- MI interventions were based in a GP practice with a specialist advisor, one female participant indicated they had experienced benefits of being active had this helped them to experience feelings of wellbeing.

"Every time you finish the exercise class the whole body feels good. It's as you have been in a Turkish bath, when you come out you feel refreshed."

- Other benefits reported by both participants included decreased weight, and reduced musculo-skeletal pain as well as increased confidence and sociability. Attendance at the MI intervention was described as helpful as it specifically highlighted personal barriers and solutions to becoming active.

The design characteristics of motivational interviewing are likely to have contributed to outcomes on participant engagement and increases in physical activity level of completers and these are reflected in [intervention case study 3](#).

Intervention case study 3: Motivational interviewing for older adults including people from Black and ethnic minority groups

In this intervention:

- A series of MI sessions were developed for adults and older adults with links to a range of other interventions. In some cases the intervention was developed alongside peer mentoring which allowed participants to receive motivational interviewing from the advisor and practical support from the mentor in becoming active.
- Healthy living resources and directories were used and pedometers helped engage participants in recording their number of steps. This helped participants' measure progress.
- Understanding the needs of priority groups was an important characteristic and dedicated advisors who delivered the MI intervention understood this. One participant indicated:
 - *"Seeing the Physical Activity Advisor made me more aware of the different ways of being physically active. I am walking more now and I am finding it is free, easy and I can do it when I want."*
- Advisors also received training and education in a range of behaviour change skills and physical activity topics. They had specialist one to one skills and used techniques to help participants consider change through client-centred materials and approaches matched to the participant's readiness. This meant personalised and realistic plans could be developed to help participants undertake change and review their progress.
- A simple referral card was developed with minimal information and this was passed from referrer, typically health or community practitioners, to those running the intervention. Working with these well-placed local partners helped to engage priority groups and was strength of this approach. Many of the partners identified participants who they felt would benefit from attending and worked to engage them.
- The use of familiar environs such as health and community centres were viewed as helpful to participants in their attempts to become active which also helped to address barriers such as perception of safety, access and cost.

The physical activity data indicates that within an initial intervention period, MI was effective in engaging adults and older adults. MI was also effective in facilitating increases in the activity levels of adult/older adult completers, including those not meeting the CMO guidelines at baseline. However the small sample size is a major caveat and limits the generalizability of the findings. The evidence indicates that MI can engage adults and offers potential to help facilitate increases to the recommended physical activity levels within adult completers. However effectiveness of MI over a longer time frame is not known from this study. Further research is required to investigate the effectiveness of MI in engaging adults and facilitating increases in physical activity in line with the CMO guidelines. This should be undertaken over a longer time frame to that used in this evaluation. The use of effectively designed pilot projects within a larger sample size accompanied with an evaluation will help facilitate this investigation.

Other Intervention Themes

As indicated previously, campaigns/directories and outdoors & transport provided little physical activity data and training and peer mentoring no physical activity data. The reasons contributing to this situation are documented in **(Appendix1)**. Calculation of median differences between baseline and intervention data in completers showed the following themes had a positive intervention effect in completers:

- Campaigns and directories +150 MET-minutes /week.
- Outdoors and transport +810 MET-minutes/week.

This represents a range of 50-270 minutes/week of brisk walking. Qualitative data from participants and practitioners offer an insight into the impact of these intervention themes on the engagement and increases in the physical activity levels of participants.

4.4.4 Peer Mentoring

Through peer mentoring, inactive older adults were successfully engaged within the intervention. In some cases this involvement led to an increase in their physical activity. Two practitioners from 2 sites and a sample of 15 mentors, 13 in one site and 2 in another site supported this outcome. The positive effect of peer mentoring is reflected in [participant case study 4](#).

Participant case study 4: Peer mentoring for older adults in community settings.

In this intervention:

- A sedentary female peer mentee described how the support she received through peer mentoring had helped to increase everyday walking, DIY and playing with grandchildren, as well as structured gym-based exercise. She indicated that:
 - *“Physically I feel like a different person, I’m walking more, can carry things better and enjoy playing more with my grandchildren again.”*
- Another participant indicated:
 - *“I am feeling very positive, I have been suffering from depression and anxiety, but I feel I have taken the first step to recovery.”*
- Going to the gym helped to create a social network, which motivated further attendance. Attending regularly helped to increase awareness, built her confidence and developed strong intentions to be active in the future. She indicated that:
 - *“I am determined to keep active now.”*

Intervention case study 4: Peer mentoring for older adults in the community

In this intervention:

- Recruitment and training of mentors was based on existing models of good practice, recognised principles and was developed with leaders in the field. Prior to the recruitment and training of mentors, policies and procedures were developed for these processes. This created a requirement for competent and motivated mentors.
- Initially the recruitment of mentors was more difficult than planned. In overcoming this, older adults and representatives of their support services promoted the intervention and their networks helped recruit mentors. In turn, newly trained mentors were used to recruit potential mentors and in some cases, mentees enrolled and successfully undertook the training. One former mentee indicated:
 - *"I have enrolled myself in the Peer Mentor Training Programme to become a mentor."*
- Mentoring was targeted in areas of high health need, one mentor said that:
 - *"The majority of people we primarily do work with are from the areas that are seen as deprived."*
- Training and ongoing support for mentors covered a range of areas including the recommendations for and benefits of physical activity and the remit of mentoring, what it was and more importantly what it wasn't. It aimed to equip mentors with the basic necessary knowledge and skills to engage older adults.
- Mentors developed a strong appreciation of activity determinants and their complex interactions and how to support and encourage people. One mentor indicated:
 - *"I think if you were talking to somebody and you wanted to be physically active, you would need somebody that could boost your confidence and help support you in that way."*
- Training included a detailed local knowledge of local community services and barriers, which helped, engage and raise awareness in participants. Making links with local services helped direct participants into exit routes and links with specialists offering motivational interviewing helped to facilitate continued engagement in physical activity.

A lack of activity data for PM makes it difficult to report on effectiveness in increasing the physical activity levels of adults and older adults. However indications are that within an initial intervention period PM can engage adults and older adults. It is likely that the design characteristics were factors that contributed to facilitating this engagement. Evidence supports the potential that peer mentoring can play in the initial engagement of adults, but further investigation is required into effectiveness of facilitating physical activity increases in line with the CMO recommended guidelines. This should take place over a longer time frame to that used in this evaluation. The use of effectively designed pilot projects with an evaluation will help facilitate this investigation.

4.4.5 Campaigns & Directories

Campaigns provided few opportunities to access information on participant experience of the intervention. Notions relating to campaign effectiveness at the community wide level are reflected in the summarised findings of the Ipsos MORI Community Survey in [Section 4.6](#). However qualitative data collected from 6 co-ordinator practitioners indicated that campaigns had engaged many participants. Examples of the campaigns implemented include:

- A physical activity theatre education programme which engaged 1000 young people.
- A half-price leisure centre scheme, which attracted two thousand participants.
- A walking project delivered to young people as part of the National Curriculum for PE.
- A young person's web site, which received over 50,000 hits.
- 10,000 copies of a physical activity directory issued to older adults including BME.

- Distribution of a healthy living map, which promoted modal shift through walking and cycling in green spaces and linear routes such as canals, parks and foot paths.
- Profiling of the physical activity needs of older adults to help practitioners to develop responsive interventions.

There is some evidence to suggest that within an initial intervention period, campaigns engaged participants, but limited evidence is available to indicate that campaigns were effective in increasing levels of physical activity participation. The nature of the campaign design, the audience and methods of measurement are all factors that are likely to have influenced this conclusion.

4.4.6 Outdoors & Transport

Three practitioners reported on implementing physical activity in parks. They indicated that priority groups had been engaged in both unstructured and structured classes and groups. This included children, older adults and adult BME. The effect of outdoor interventions is reflected in the [participant case study 5](#).

Participant case study 5: Physical activity promotion in green spaces for adults and children

In this intervention:

- A day of taster sessions ran and 350 participants were engaged. A BME family (mother and two children) spontaneously arrived at a taster session in the park. She indicated that:
- *“This was the first time they had left their flat since the start of the school holidays”* (it was a Thursday), as the mother was worried about safety of the children. To her, this supervised activity in a nearby park provided a uniquely safe and local opportunity to become active.

Factors contributing to outcomes on engagement in physical activity are likely to be the design characteristics of outdoors and transport interventions and these are reflected in [intervention case study 5](#).

Intervention case study 5: Promoting physical activity to adults and young people in green spaces

In this intervention:

- Work was undertaken to improve the physical environs of parks and green spaces and provide a range of formal and informal opportunities for local adults and children to become active.
- Local people had expressed concerns regarding anti-social behaviour, safety, vandalism and lack of or/poor quality facilities.
- Green spaces represent a setting where it is necessary to engage those working there such as park keepers and an effective stable park-keeping service was a major community need. Intervention staff worked with local community groups and one, the 'friends of the park' (FOP) group who played an important role in generating solutions. This is reflected in an intervention with a number of strands (I) park service reform, (II) improvements to facilities (III) volunteering:
- **(I) Park service reform:** This was instituted to improve the park service. At the outset, park keepers or Green Space Leaders (GSL) were paid close to the minimum wage with limited opportunities for training, education and career progression and a number felt limited incentive to engage in reform. The recruitment of new GSL was difficult due to the perceived poor terms and conditions of service. The FOP acted as a pressure group on local services to instigate reform of the parks service.
- By improving the profile of the post of GSL and providing career opportunities and training, a greater number of internal GSL engaged in the 'reform' as they could see the potential for progression.

- This created greater capacity within the service meaning the safety and security of the parks could be better maintained and physical activity interventions could be set up to engage priority groups.
- **(II) Improvements to facilities:** Community groups, like the FOP provided many skills and attributes for developing interventions and were able to work with partners in the health and leisure area as part of a strategic partnership. A successful application obtained £100K funding for multi-use games and a children's play area. Other actions led to improved park furniture, signage and lighting. Improvements in the physical infrastructure in the park were seen as being valued by participants. One practitioner indicated that:
 - *"It is about how people treat a facility based on the degree that they value that facility. Some of these kids who are now playing tennis on that court don't want to see other kids damaging the court, you know some of those kids who play multisports on the nice grassed areas, they don't want to see cars on that grassed area, it is their grassed area now."*
- **(III) Volunteering:** Community groups like the FOP also helped staff events and provide physical activity classes and groups such as health walks and football coaching sessions which engaged a range of priority groups. However it was important that those volunteering felt supported. One physical activity practitioner indicated:
 - *"I coordinate a walk leader's meeting and many are volunteers from the community who had heart attacks and became walk leaders themselves. We have support meetings and I think as long as they've got someone they can link with and communicate with and feel supported, they could definitely continue " [in this role]."*

The limited sample of physical activity data was linked to the difficulty of data capture in structured and unstructured outdoor activity. The design characteristics of interventions, notably those that aimed to increase perceived safety and management of environmental barriers are likely to have been influential factors in facilitating engagement. Interviews with walk leaders and LEAP project staff indicate that young people, adults and older adults had been engaged in walking and OA events held as part of the LEAP programme. Outdoor interventions in green spaces hold potential for promoting physical activity. The effectiveness of interventions in increasing physical activity to recommended levels in priority groups requires further and in-depth investigation.

4.4.7 Training Co-ordinators and Leaders

No physical activity data was collected from co-ordinators and leaders. However data from practitioners indicate that the exposure of 'co-ordinators and trainers' to training interventions led to the creation of new opportunities. These engaged physical activity priority groups including young people, adults, older adults and BME adult groups and reflected in the [participant case studies 6-8](#).

Intervention case study 6: Training leaders & co-ordinators in activities for children & young people

In this intervention:

- 48 schoolteachers were trained to deliver Speed, Agility, Quickness (SAQ) in primary schools. This provided a new school-based activity that helped address the physical activity needs of pupils some of whom were uninspired by traditional curricular and extra-curricular offerings. 840 (95.2%) reported being exposed to SAQ lessons. In one case study a schoolteacher referred to a participant who found SAQ enjoyable and manageable.
 - *"She (the participant) loves the activity, but at first she was very unsure about it, because she wasn't sure if she would show herself up. I found that she has buddied up with somebody and they have helped her through the tunnel, by just holding it for her so she could get in, once she is in she is all right."*
- Training was funded by the PCT and updates were regularly provided allowing the staff skills to be replenished. Staff were supported with time to attend training sessions and schools supported with financial help to purchase equipment to run sessions.
- Training, along with other support, had led to SAQ being included in formal PE sessions as well as establishing pre/after schools sessions. This led to participants experiencing perceived health benefits of an active lifestyle. One teacher indicated:
 - *"All of the children in the circuits group have really improved their fitness and had lots of fun exercising every week. Their confidence and their health image has improved. The benefits of circuits are affecting their whole life."*

- **Intervention case study 7: Associate advisor training for adults/older adults**
- In this intervention associate advisor training aimed to provide professionals allied to health, such as community workers and community nurses, with key physical activity messages and an understanding of the opportunities available to older people. Seventy-five practitioners were engaged, and in a sub-sample of 20, 13 indicated that the training was relevant and appropriate for their needs. One physical activity practitioner said:
 - *“I think the feedback from the training was fantastic and I think a lot of people learnt quite a lot, found out what was happening in the area, and about physical activity awareness.”*
- Training helped prepare practitioners to promote activity to older people who they engaged through their daily work. Data from a local evaluation indicated that 85% of people said the training was ‘very good’ and 74% indicated that the training was relevant and appropriate for their needs. As a result of the training 60% of people reported changing their own lifestyle and 50% of respondents reported that their attitude to physical activity had changed for the better.

Intervention case study 8: Training of green space leaders to promote physical activity

In this intervention:

- Ring-fenced funding was transferred from the PCT to the Parks Service. This enabled training to be provided to green space leaders (GSL) on physical activity, and on how to set up and/or run physical activity programmes such as park basket ball and health walks.
- The training was linked into a Continuing Professional Accreditation Assessment within the Park Service and monitored by external agencies. This tied the Parks Service into supporting this process. One physical activity practitioner indicated that:
 - *"We've got an agreement from the Parks Department where there is a training matrix to get park-keepers through three levels of delivery. This ranges, from assistant coaches and just taking registers with people, right up to being able to take a level 1 coaching qualification to actually lead sessions."*
- Once trained GSLs helped LEAP project leaders to set up equipment for participants and deliver activity sessions with physical activity priority groups. Training was supported and championed by senior management in the PCT and the Local Authority thereby helping to engage the GSL in this work. One physical activity practitioner indicated that:
 - *"Five Park keepers have started training and this has already received positive feedback from Friends of the Parks."*

Due to a lack of data it is impossible to report on the effect of training leaders and co-ordinators on increasing physical activity levels. Nonetheless qualitative evidence points to the potential that training had in helping to create physical activity opportunities. These helped engage priority groups through new physical activity opportunities or capacity building for physical activity. The extent to which training is effective in facilitating increases in recommended physical activity levels of priority groups requires further in-depth investigation.

4.5 The Economic Analysis

4.5.1 The Distribution of Funding Sources of LEAP Sites

Table 7 shows the distribution of funding sources for the ten LEAP sites. It demonstrates that the proportion of funding received from LEAP ranges from c37% to c88%. The proportion of funding received from partners ranges from c12% to c63% and a small proportion of funding came from other sources. These were not identified through this evaluation.

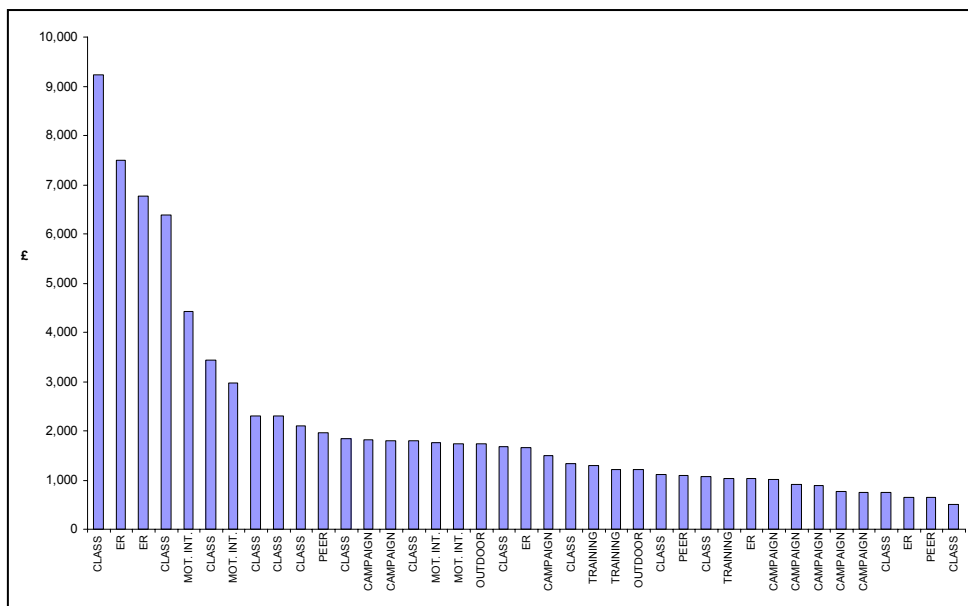
Table 7: Distribution of funding sources.

Site	1	2	3	4	5	6	7	8	9	10
LEAP	53.9	85.3	80.1	87.2	42.3	49.6	53.8	88.1	44.7	37.1
Partners	43.8	14.6	11.3	11.6	57.0	50.4	45.8	11.9	55.1	62.9
Others	2.3	0.1	8.6	1.2	0.7	0.0	0.4	0.0	0.2	0.0

4.5.2 The Monthly Economic Cost of Running LEAP Interventions

Figure 13 shows the cost per month of running LEAP interventions. It demonstrates that the monthly cost of implementing LEAP interventions ranges from c£500 to c£9,200. There was no obvious relationship between LEAP intervention type and the monthly cost of implementation.

Figure 13: LEAP intervention average cost (£) per month



4.5.3 The Cost per Participant of LEAP Interventions

Figure 14 shows the cost per participant of LEAP interventions. It demonstrates that the cost per participant of LEAP interventions ranges from c£50 to c£3,400. There was no obvious relationship between LEAP intervention theme and cost per participant.

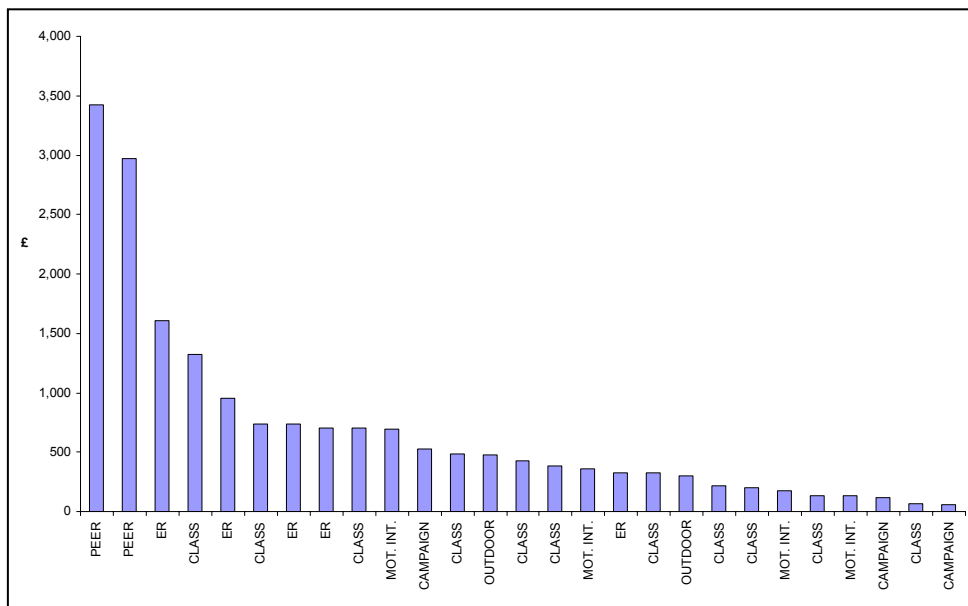
Insights from the intervention practitioner interviews suggest a number of factors influence the cost of implementing LEAP interventions:

- Method of Participant Engagement.** Certain interventions engaged participants in one-to-one designs, such as peer mentoring, motivational interviewing, and one exercise referral intervention. Other interventions engaged participants through large groups, such as in campaigns, some classes and groups and referral programmes. Some classes and groups engaged participants following a period of outreach work.

- **Nature of intervention delivery:** One-exercise referral intervention was delivered in people's homes. In one example a motivational interviewing intervention was delivered in community centres that had to be hired, incurring higher staff time and travel costs compared with motivational interventions delivered via telephone. Interventions that required specialist facilities, such as aquatic venues, incurred higher costs than interventions using 'free' open space.
- **Development costs:** Certain interventions, such as the health living maps campaign, required significant set-up costs, such as the professional design and production of materials. Other interventions, such as certain exercise referral programmes, were 'bolted-on' to existing programmes, thus reducing their development costs.
- **Specialist staff.** A number of interventions required staff with specialist skills. These included motivational interviewing peer mentoring, exercise referral and some classes and groups.

These factors suggest ways in which an intervention type can be implemented in different ways and thus how costs can vary within intervention types. However further research and investigation is required to understand cost variation more thoroughly and verify these and other potential explanations.

Figure 14: LEAP intervention average cost (£) per participant

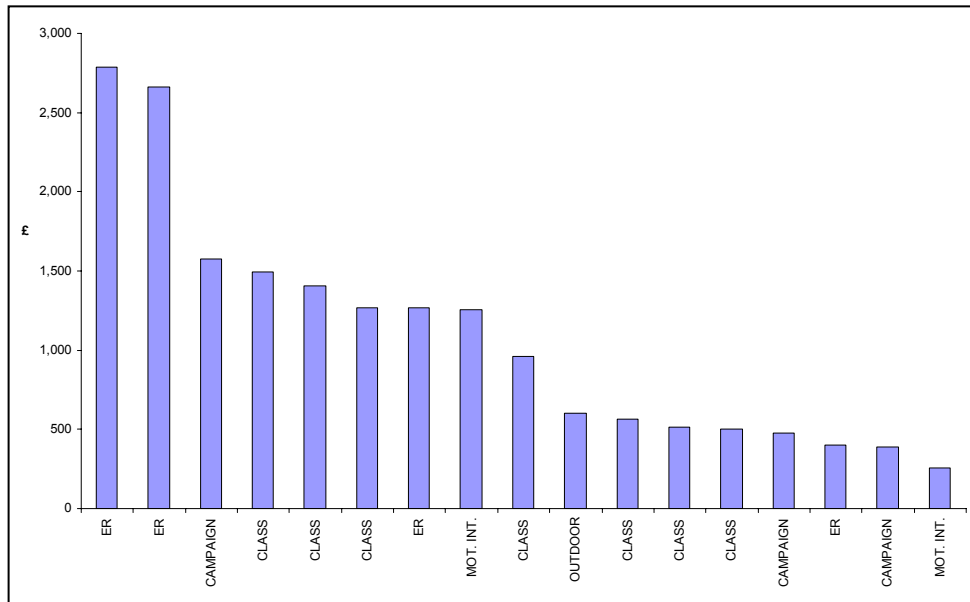


4.5.4 Cost per Participant who improved their Physical Activity Category

Figure 15 shows the cost per participant who improves their physical activity category. It demonstrates that the cost per participant improving their physical activity category ranges from c£260 to c£2,790.

There was no obvious relationship between LEAP intervention theme and cost per participant improving their physical activity level. An important caveat with this result is the small sample sizes used to calculate the effect of individual LEAP interventions.

Figure 15: Cost (£) per LEAP participant who improves their physical activity category



4.5.5 Costs per Quality Adjusted Life Year (QALY) Gained

The improvements in physical activity participation with LEAP are expected to impact on the chances that participants will suffer adverse health states in the future. In turn, this will impact on the future quality adjusted life years gained.²¹ This in turn could lead to a reduction in the future costs to the NHS of treating these health states.

- **Figure 16** shows the cost per QALY gained from each of the LEAP interventions. It demonstrates that the cost per QALY gained from interventions ranges from c£50 to c£510. Importantly this was significantly lower than the £30,000 threshold, implied by the National Institute for Health & Clinical

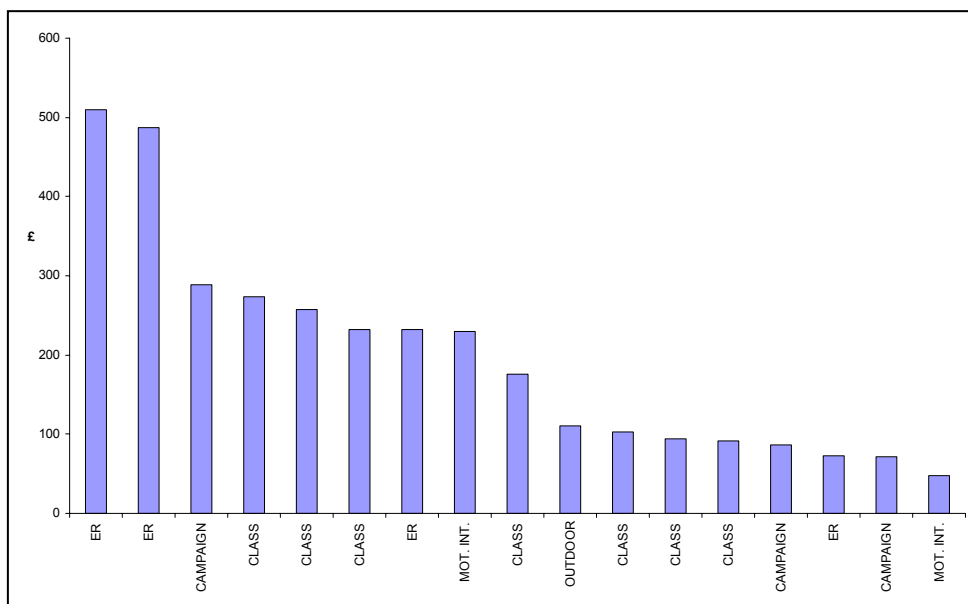
²¹ QALYs (Quality Adjusted Life Years) are measures of quality of life. They take account of the duration of a life and the quality of each year in that life. Further detail on the definition and calculation of QALYs is available in appendix two.

Excellence (NICE) below which an intervention is worth investing in. Once again an important caveat to this result is the small samples sizes used to calculate the effect of the individual LEAP interventions.

- Another caveat is that only 10% of participants who engaged LEAP interventions (excluding campaigns and directories) provided both a baseline and an intervention measure for physical activity participation. This raises the issue of a potential self-selection bias. However as the outcomes for cost per QALY gained are so impressive, this caveat is unlikely to make a difference to the conclusions drawn for cost per QALY gained using the £30,000 threshold implied by NICE decisions.

There was no obvious relationship between intervention theme and the cost per QALY gained from interventions. Further research would aim to identify the reasons underpinning the variation in cost and the circumstances in which interventions themes are more and less costly.

Figure 16: Cost per QALY gained per participant from LEAP interventions

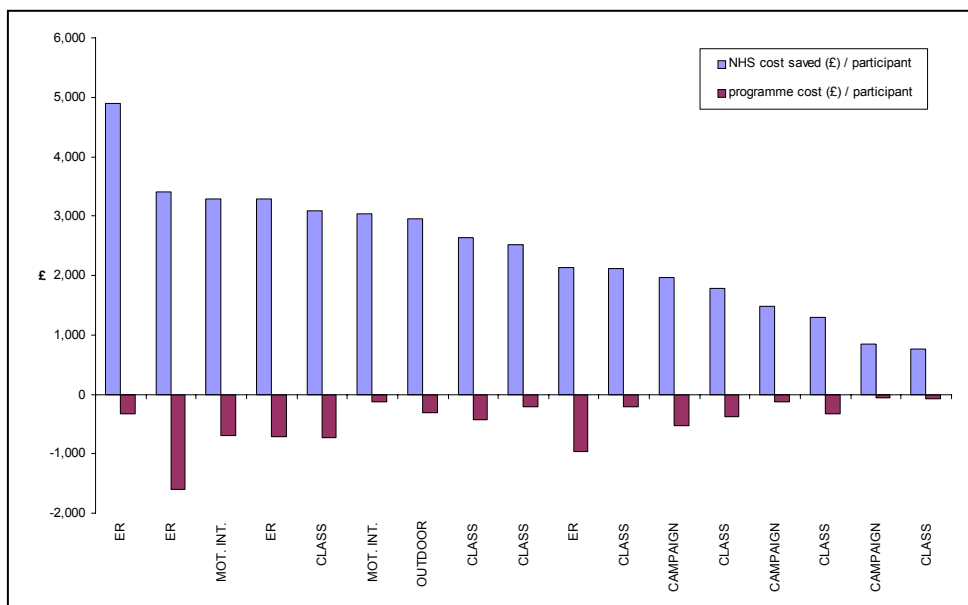


A key assumption in the calculation of the cost per QALY gained is the relationship between physical activity and future health states. In the model, this relationship is captured in the relative risk (RR) of experiencing health states when participating in physical activity compared with not participating in physical activity. Further detail on the magnitude and source of the RR estimates used in the model are available in **Appendix 2**. Sensitivity analysis suggests that the finding that LEAP interventions are cost effect is not sensitive to the RR estimates used in the model. It demonstrates that, even at the lowest RR estimates, the worst performing LEAP intervention still had a cost per QALY gained estimate significantly below the £30,000 threshold used in NICE decisions (c£14,500). **Figure 17 (Appendix 6)** summarises the results of this sensitivity analysis.

4.5.6 Future Financial Savings to the NHS as a Result of LEAP Programme

The improvements in physical activity with LEAP are expected to impact on the chances that participants will suffer adverse health states in the future. In turn, this will impact on the future costs to the NHS of treating these health states. **Figure 18** shows the future financial savings to the NHS per LEAP participant due to the improvements in physical activity resulting from the LEAP interventions. It demonstrates that the future cost savings to the NHS per LEAP participant ranges from c£770 to c£4,900. In the case of each of the interventions, this saving per participant exceeds the current cost per participant of implementing LEAP interventions, which ranges from c£50 to c£3,400.

Figure 18: NHS cost savings per participant as a result of LEAP



Sensitivity analysis indicates that the conclusion that LEAP interventions save more money than they cost to implement is not very sensitive to the assumptions made in the modelling process. **Figure 19 (Appendix 7)** summarises the results of this sensitivity analysis.

Conclusion

- Although there was variation within and between themes, LEAP interventions were cost effective, affordable, offer potential savings to the NHS and a worthwhile investment.
- The economic analysis suggests that LEAP as a whole is value for money, but it is unable to state which intervention theme is most cost-effective. Therefore, while LEAP interventions were a worthwhile investment, it is not possible to say which type of LEAP intervention offers the most value for money.
- Further exploration of the nature of the interventions and the process of implementation is required to identify the factors that cause them to be more or less cost-effective.

4.6 The Ipsos MORI Community Survey

4.6.1 Levels of Self-reported Physical Activity

Overall Physical Activity

Between 2003 and 2005 there was no statistically significant increase in physical activity at a community level in any of the five LEAP sites. This indicates that the LEAP programme was not associated with increased physical activity at a community level.

Walking

Total hours of reported walking increased between study years overall and in both LEAP and control respondents ($p < 0.05$) to a similar degree, so there was no observable “LEAP effect”.

Moderately Active Physical Activity:

Other summary measures of participation in moderate intensity physical activity increased between 2003 and 2005 in both LEAP sites and the control site to a similar degree, so there was no observable “LEAP effect”.

Highly Active Physical Activity:

Participation in highly active physical activity increased more in LEAP sites than controls. However this effect is removed when potential confounding factors were taken account of in a multivariate analysis.

Physical activity - Multivariate analysis:

A multivariate analysis showed that the LEAP programme was not associated with any changes in participation in recommended levels of physical activity at a community level either overall or for individual LEAP sites.

Participation in Local Physical Activity Programmes

In the follow up survey, around 4%-5% of participants said they had participated in any event, which was part of a local campaign or programme. This level of

participation increased over time, but is not higher in LEAP sites when compared to the control site.

4.6.2. Awareness of Key Physical Activity Messages and Community Interventions.

Respondents living within LEAP sites were not more likely than participants in the control site to recall any campaign, the LEAP campaign specifically, or any of the main campaign components. There was no difference between LEAP and control sites in attitudes towards campaigns.

4.6.3 Intention to Undertake Physical Activity.

Intention to be physically active increased to a similar extent in LEAP and control sites. There was a secular trend over time, but no effect of LEAP sites when compared to the control site.

4.6.4 Social Climate for Physical Activity.

There was a significant increase in the likelihood of strongly agreeing with the social norm questions in LEAP sites when compared to the control site. This showed an effect of both secular trends over time, and high rates in the LEAP and control sites. This indicates that the LEAP programme may have improved social norms towards physical activity in LEAP sites.

Conclusion

No significant change was found in physical activity at the community wide level, and there are a number of possible explanations for this. Firstly, this may have been due to an actual low penetration of LEAP interventions across the LEAP sites, with the activities reaching selected groups in the area, but not having a measurable population impact. Secondly, although this study used a validated questionnaire, it is possible that the tool was not sensitive enough to measure change in moderate intensity physical activity at the level expected within a programme such as LEAP. Thirdly it is worth considering the effect of secular trends. Many of the measures in the study increased over time in both LEAP sites and the control site. This may

mean that the sample sizes were not large enough for the study to be able to detect effects, given the size of the reported changes in controls. Finally, it is worth putting this into context. Those responsible for implementing the Community Survey have indicated that reviews (Cavill & Foster, 2004) of community-based physical activity programmes have shown that changes in physical activity are difficult to achieve at a community level and take significant investment and time. It may be that the LEAP programme was simply not resourced well enough to make an impact on population levels of physical activity or intention to be more active within the two-year timeframe.

5.0 RECOMMENDATIONS

5.1 For Commissioning Agencies

All LEAP interventions were cost-effective, but the economic analysis was unable to identify which intervention types were the most cost-effective. However analysis was able to identify the effect that some intervention types had on engaging and facilitating increases in physical activity levels. This effect was identified with more certainty²² in some intervention types than in others, thus the recommendations set out in (5.1.1- 3) are made on this basis.

In effectively purchasing physical activity interventions that engage and help facilitate an increase in the activity levels of participants including priority groups, commissioners of physical activity services are recommended to:

- 5.1.1. Commission exercise referral.²³ This was found to be both cost effective, and effective within an initial intervention period in engaging and increasing the physical activity levels of adults and older adults not meeting the CMO guidelines for physical activity.
- 5.1.2 Commission classes and groups with young people. These were found to be both cost effective and effective within an initial intervention period in engaging and increasing the physical activity levels of young people not meeting CMO guidelines for physical activity.
- 5.1.3 Commission 'pilot' projects with an evaluation for classes and groups and motivational interviewing with adults. These were found to be both cost effective

²²Analysis indicated that within the intervention theme, there was an overall increase in physical activity levels Intervention - Baseline median MET-minutes/week and/or sedentary completers progressing one physical activity category or sedentary or lightly active completers meeting CMO guidelines at intervention.

²³ Commissioners are also referred to NICE (2006b) Public Health Intervention Guidance 2. Four commonly used methods to increase physical activity: brief interventions in primary care, exercise referral schemes, pedometers and community based exercise programmes for walking and cycling.

and effective within an initial intervention period in engaging and increasing the physical activity levels of a small sample of adults. The effectiveness of these interventions with a larger sample size requires further investigation.

- 5.1.4 In all of the above (5.1.1-1.3) commissioners need to explore how engagement and change can be translated into longer term maintenance of the CMO guidelines beyond the initial intervention period used in this evaluation. Commissioning effectively designed interventions and an evaluation will help facilitate this exploration.

5.2 For Delivery Agencies

In effectively and efficiently implementing recommended interventions that engage and contribute to increases in the physical activity levels of priority groups, delivery agencies are recommended to:

- 5.2.1 Pre plan interventions to assess and then meet the needs of participants. Recruit staff with a suitable range of skills for promoting physical activity with priority groups.
- 5.2.2 Recruit community groups and individuals. They act as a reference point and provide valuable information for shaping interventions to meet participant need. This helps to engage priority groups in physical activity.
- 5.2.3 Promote physical activity within a strategic framework. This can facilitate the development of partnerships at the strategic and delivery level. Partnerships provide valuable resources for engaging priority groups in physical activity. These resources include skills, knowledge and facilities.

5.3 For Evaluation Agencies

In effectively evaluating community physical activity interventions evaluation agencies are recommended to:

- 5.3.1 Adopt validated tools that are simply administered and understood by practitioners and participants. Where appropriate, use adapted versions or alternative validated approaches to collect data. Build in pilot exercises and frequent quality assurance checks. These can increase the quality of the data.
- 5.3.2 Have regular dialogue with those delivering interventions when developing data collection protocols. Act on feedback as it can improve data collection processes.
- 5.3.3 Lead on making ethical clearance applications. Ensure that those involved in evaluation understand and adhere to ethical processes.

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