Evidence statements on the effectiveness of local interventions to promote cycling and walking for recreational and travel purposes.

These evidence statements were developed for the Walking and Cycling Programme Development Group (PDG) by NICE following the consideration of the review submitted by ScHARR. This version of the evidence statements is the one used by the PDG in developing the guidance recommendations.

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EVIDENCE STATEMENTS

All evidence statements adhere to the following format:
Title, main evidence statement followed by information from supporting studies.
Studies: **First author, date of publication** ([quality rating of study] country study took place, sample size of study, intervention duration/length of follow-up) [*intervention details*]. Main (relevant) study findings.

POPULATION LEVEL CHANGE

EVIDENCE STATEMENT 1. POPULATION LEVEL CHANGE IN MASS MEDIA INTERVENTIONS TO INCREASE WALKING

There was inconsistent evidence from 2 studies on the effectiveness of mass media interventions (which included paid advertisements [TV, radio, cable, newspapers], billboards/posters, public relations, educational activities and community participation), delivered in the community in increasing population levels of walking for leisure or travel in adults up to one year post intervention. One BA study (Wimbush 1998 [+]) showed no effect on walking (the reporting of data in this study was poor) and one CS study (Wray 2005 [+]) showed a small, but positive effect on walking.

Wimbush 1998 (BA [+] UK n=3476, 12 months) [*40 second TV advert supported by a telephone helpline*]. No change in number of days spent walking for at least 30 minutes: mean of 4.26 days in 1995 and 4.13 days in 1996, no significance statistics given.

Wray 2005 (CS [+] USA n=297, 5 months) [*Billboard, newspaper, radio, and poster advertisements*]. Those exposed to the campaign were more likely to walk for at least 10 minutes on more days of the week than the control group: (5.2 days vs. 4.52 days t[7]=2.34, p=0.02).

Population level evidence on mass media interventions to increase walking is partially applicable to the UK as one study was conducted in the UK. The differing environment in the USA must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 2. MULTI-COMPONENT COMMUNITY BASED INTERVENTIONS TO PROMOTE WALKING

There was inconsistent evidence from 6 studies concerning the effectiveness of multi-component interventions on increasing population levels of walking for leisure or travel in the long term. 4 nRCT papers (NSW Health Department 2002 [+], Reger 2002 [+], Reger-Nash 2005 [++], Reger-Nash 2006 [+]) showed positive effects on walking and 2 nRCT papers (Brownson 2004 [++], Brownson 2005 [+]) indicated that the interventions were not effective in increasing walking.

Brownson 2004 (nRCT [++] USA n=1233, 12 months) [*individually tailored newsletters, interpersonal activities that stressed social support, community wide events such as walk-a-thons*]. Rates of 7 day walking for any purpose or for exercise declined slightly in the intervention communities compared with the comparison sites: -1.4min, p=0.91; and -5.6, p=0.37 respectively.
Brownson 2005 (nRCT [+] USA n=1531, 12 months): [*as above*]. Change in walking was higher in intervention (11.7 minutes) than comparison (6.5 minutes), although not statistically significant. Percentage of respondents who met the recommendation for walking was the same across the intervention and comparison areas: 22.2% and 21.6%, p=0.811.
NSW Health Department 2002 (nRCT [+] Aus n=two wards, 2 years) [*park modifications, media campaign, walking maps*]. Those in the intervention ward were more likely than those in the control ward to have walked in the two weeks prior to follow up (89.3% vs. 81.0% respectively; X2=11.51, p=0.001), and within-ward analysis indicated that walking increased from baseline in the intervention ward (X2(1)=5.85, p=0.016), but not in the control ward (X2(1)=0.07, p=0.794). There was no difference in the number reaching adequate levels of physical activity (health department recommendations).
Reger 2002 (nRCT [+] USA n=1472, 8 weeks) [*Paid advertising, public relations events to generate media coverage, public health educational activities at work sites, churches and local organisations*]. 23% increase in walking observations in the intervention community versus a 6% decrease in the comparison community: OR 1.31, 95% CI 1.14 – 1.50; p<0.0001.
Reger-Nash 2005 (nRCT [++] USA n=1472, 12 months) [*Paid advertisements (TV, radio, cable, newspapers), public relations and community participation*]. The least active group in the intervention population were more likely than control population to have increased daily walking: OR=1.72, 95%CI 1.01-2.95.
Reger-Nash 2006 (nRCT [+] USA n= 4 communities, 8 weeks) [*4 interventions: Welch Walks (WW): paid media, media relations, community activities; BC walks (BC): WW components + website; Wheeling walks and WV walks: BC components +12-week participatory planning, policy & environmental changes*]. 32% of insufficiently active persons in Wheeling Walks reported meeting the criteria for regular walking immediately post campaign compared to an 18% increase in the comparator community (OR=2.12, 95%CI 1.41-2.24). An increase in reaching regular walking was observed for the most sedentary group in WV walks (p<0.05). The intervention community in Welch walks demonstrated a twofold (OR=2.0 95%CI 1.01-3.97) gain in weekly walking by at least 30 minutes versus the comparison community. 41% of the BC walks intervention community increased walking by 30 min/week compared to 30% in the control (OR=1.56 95% CI 1.07-2.28).

The population level evidence on multi-component interventions to increase walking is only partially applicable to the UK as studies were conducted in the USA and

Australia. The differing environment in the USA must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 3. POPULATION LEVEL CHANGE IN MASS MEDIA INTERVENTIONS TO INCREASE WALKING AND CYCLING: AUSTRALIA WALK TO WORK DAY

Moderate evidence from one BA study (reported in two papers: Merom 2005 [+], Merom 2008 [+]) suggests that the mass media campaign "Australia Walk to Work Day" (a collaborative annual event in which members of the public are encouraged to walk (or cycle) to work) may be effective in increasing population levels of walking and cycling for travel in adults up to one year post intervention. This intervention resulted in positive effects on both walking and cycling.

Merom 2005 (BA [+] Aus n=1100, at least one year). Overall, total weekly minutes of moderate physical activity increased by 20min/week ($t[1087]=4.76$, $p<0.005$ with, an decrease in the proportion who were inactive (-4.0% $p<0.005$). Significant population increase in total walk time: +16min/week $t[780]=2.04$, $p<0.05$ (in participants who were employed, and in minutes spent walking increased by 21min/week in 'passive commuters' ($t[535] = 2.42$, $p< 0.05$).
Merom 2008 (BA [+] Aus n=1100, 2 months). Significant population level increase in health enhancing active commuting: 3.9%, $p=0.01$.

The evidence on mass media interventions to increase walking and cycling is only partially applicable to the UK as studies were conducted in Australia. The differing environment in Australia must be considered in reference to these studies. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 4. POPULATION LEVEL CHANGE IN TRAVEL SMART AS AN INTERVETION TO INCREASE WALKING AND CYCLING

Weak evidence from a series of evaluation reports (TravelSmart 2006 [+], TravelSmart 2011 [+]) suggests that TravelSmart is effective in increasing population levels of walking and cycling for travel in adults (who volunteered to participate) at least over one year. TravelSmart uses "Individualised travel marketing" (ITM) which aims to highlight travel choices "people may not know they have" by providing locally relevant information and support to households. The evidence is moderate as the reports only present percentage change data and limited methodologies. The intervention targets individuals, but data is reported at population level.

TravelSmart 2006 (Evaluation report [+] Aus n=5 regions, various). Household projects routinely showed decreases in car use of 4-15% and rise in use of walking, cycling and public transport.
TravelSmart 2009 (Evaluations reports [+] UK n=19 regions, various). Cycling for travel increased by between 14% and 69%, travel by walking increased between 9% and 29%, travel by car decreased at each site by between 10 and 14%, overall sustainable travel trips increased at each site (between 9% and 29%).

The evidence on this intervention to increase walking and cycling is fully applicable to the UK as most of the data reported is from UK sites. However, the differing environment in Australia must be considered in reference to the data collected there. Individual local contexts as well as the setting will also impact on the applicability of data from individual sites.

EVIDENCE STATEMENT 5: POPULATION LEVEL CHANGE IN CYCLE DEMONSTRATION TOWNS AS INTERVENTIONS TO INCREASE CYCLING

There is moderate evidence indicating that Cycling Demonstration Towns (CDT) (*multi component interventions to increase cycling in 6 towns*) are effective in increasing population levels of cycling for active travel in the general population up to 10 years post intervention: an ER (Cope 2011 [-]), 1 BA (Sloman 2009 [+]) and 1 ITS study (Cope 2009 [+]) showed positive effects on cycling in cycle demonstration towns, although the significance of the effects is not reported. [See also ES7 and ES6].

Cope 2009 (ITS [+] UK n= 6 towns, 4 years). Automatic counter data indicated an average increase in cycles counted of 27%. Proportion of pupils cycling to school at least once a week increased from 12% pre-survey to 26% post-survey.
Cope 2011 (Evaluation report [-] UK n=6 towns, 10 years) [*this report also uses data from other interventions*]. Data from automatic cycle counts indicated a 12% increase overall in usage of cycle routes and up to 60% at specific sites.
Sloman 2009 (BA [+] UK n=1500, 4 years). Proportion of adult cycling for at least 30 minutes once or more per month increased from 11.8% in 2006 to 15.1% in 2008, an increase of 3.3%-points or 28%.

The evidence on cycle demonstration town is directly applicable as it was conducted in the UK.

EVIDENCE STATEMENT 6: POPULATION LEVEL CHANGE IN MULTI-COMPONENT INTERVENTIONS TO INCREASE CYCLING

Weak evidence from 1 nRCT study (Rissel 2010 [+]) suggests that multi-component interventions are not effective in increasing population levels of cycling in the general population up to 2 years post intervention, but may result in increased use of bicycle paths and increase in cycling amongst new/beginner cyclists. [See also cycle demonstration towns, ES 5].

Rissel 2010 (nRCT [+] Aus n=909, 2 years) [*multi component community based intervention including: organised bike rides and events, cycling skills courses, distribution of cycling maps of the area, local press coverage*]. Significantly greater use of the bicycle paths in the intervention area (28.3%) at follow-up compared with the comparison area (16.2%): $p<0.001$. No self reported increase in residents who said they cycled in the last year, however significantly more “novice”/beginner riders had cycled in the last year in the intervention area (11.5% vs.1.4% in the comparison area; $p=0.013$).

The population level evidence on multi-component interventions to increase cycling is only partially applicable to the UK as the study was conducted in Australia. The differing environment in Australia must be considered in all studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 7: POPULATION LEVEL CHANGE IN MULTI-COMPONENT INTERVENTIONS TO INCREASE WALKING AND CYCLING IN ADULTS

Weak evidence from 4 of 5 studies indicates that multi-component interventions delivered in the community (De Cocker 2009 [+], Hendricks 2009 [-], Sloman 2010 [+], TenBrink 2009 [-]) are effective in increasing population levels of walking and cycling for travel and/or leisure up to 9 years post intervention. Evidence from the 3 BA (De Cocker 2009 [+], Hendricks 2009 [-], Sloman 2010 [+]), and 1 ITS (TenBrink 2009 [-]), showed mostly positive effects of community interventions to encourage cycling and walking for travel and/or leisure. One nRCT (Wendel-Vos 2009 [+]) indicated that multi-component interventions may reduce a natural decline in walking in women and that amongst those with a low educational level cycling may show a small increase.

De Cocker 2009 (BA [+] Belgium n=438, 1 year) [*Physical activity promoted in the entire city of Ghent. Central theme of '10,000 steps/day', with secondary taglines of 'every step counts') and 'every revolution (of bicycle pedals) counts', pedometers given*]. 47.5% increased average step counts by 896 steps/day or more at one-year follow-up (no statistical analysis; cycling was “converted” to step counts).
Hendricks 2009 (BA [-] USA n=not reported, 12 months) [*Multi component intervention to increase safe physical activity opportunities and encourage walking and biking for short trips*]. The number of people seen using active transportation increased from 1028 in 2005 to 1853 in 2006 (63% increase). Walking to school more than doubled at three of four schools engaged for at least 2 years (no other analysis).
Sloman 2010 (BA [+] UK n=at least 12,000, 4 years) [*3 Sustainable Travel Towns which implemented intensive town wide Smarter Choice Programmes to encourage use of non car options; bus use, cycling and walking, and less single occupancy cars*]. Cycle trips per head grew substantially in all three towns by 26-30%. Comparison towns cycle trips decreased. Walking trips per head grew substantially by 10-13% compared to a national decline in similar towns.
TenBrink 2009 (ITS [-] USA n=not reported, 1 year) [*Project U-Turn, active transportation (biking, walking, and transit use) through an integrated approach to Active Living, ran for 5 years, targeting 36,000*]. Citywide count of people using active transport, showed an increase of 63% over 1 year, limited study details provided. Also had a major schools component and reported an increase in walking over time, no statistics given.
Wendel-Vos 2009 (nRCT [+] Netherlands n=3114, 5 years) [*Community-based project with 790 lifestyle interventions, 361 were physical activity focussed, example: printed guides of walking and cycling routes*]. There was a smaller decline in walking in women in the intervention compared to control region (-0.3 hours/week vs. -2.3 hours/week; $p \leq 0.05$); and amongst those with a low education level there was a significant difference in change in cycling and walking in the intervention vs. control region (0.2 hrs/week vs. -0.3 hrs week respectively for cycling and 0.0 hrs/week vs. -2.2 hrs week for walking; both $p \leq 0.05$).

The population level evidence on multi-component interventions to increase walking and cycling in adults is only partially applicable to the UK as one study was conducted in the UK. The differing environment in the USA and Europe must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 8: POPULATION LEVEL CHANGE IN MULTI-COMPONENT INTERVENTIONS TO INCREASE WALKING AND CYCLING IN CHILDREN

Inconsistent evidence from 3 studies on the effectiveness of school based multi-component interventions to increase levels of walking and cycling for children. Evidence from 2 BA studies (Cairns 2006a [+], Staunton 2003 [+]) showed positive effects on school population level walking in children however evidence from 1 cluster RCT (Rowland 2003 [++]) showed no effect on cycling and walking for school travel.

Cairns 2006a (BA [+] UK n=179, 41 months) [*School travel plan group developed a walking bus scheme, incentive scheme "going for gold" included children cycling or scooting to school, also cycle training, pedestrian training, park and walk scheme, curriculum work, school assemblies and newsletters*]. Walking to school increased from 30% to 58.8%, cycling to school increased from 0 to 4%.
Rowland 2003 (Cluster RCT [++] UK n=21 schools, 12 months) [*multi component school travel plans were developed by a school travel co-ordinator*]. The proportion of children walking or cycling to school was not affected by the intervention.
Staunton 2003 (BA [+] UK n=11 schools, up to approximately 18 months) [*Safe Routes to School. Identified and creates safe routes to school, invites community wide involvement, full time educator employed to develop curriculum and volunteer team leader in each school*]. Increase in number of school trips made by walking (64%) and biking (114%).

The population level evidence on multi-component interventions to increase walking and cycling in children is applicable to the UK as all studies were conducted in the UK. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 9: SCHOOL BASED CHANGE IN INTERVENTIONS TO INCREASE CYCLING IN CHILDREN

Weak evidence from 1 study suggests that school based multi-component interventions may be effective in increasing school population levels of cycling in children. Evidence from a BA study (Sustrans 2008 [+]) showed positive effects on walking at the school population level.

Sustrans 2008 (BA [+] UK n=52 schools, 1 year) [*Bike It. School travel plans, cycling champions in schools to demonstrate to parents and pupils that cycling is a popular choice. Aims to create a pro-cycling culture*]. Percentage of school pupils cycling to school every day increased from 3% to 10%. Number of pupils cycling at least once a week increased from 10% to 27%. Number of pupils who never cycled decreased from 80% to 55%.

The evidence on multi-component interventions to increase cycling in children is applicable in the UK as the study was carried out in the UK.

EVIDENCE STATEMENT 10A. WALKING SCHOOL BUS INTERVENTIONS TO INCREASE WALKING

Moderate evidence from 3 BA studies (Bickerstaff 2000 [+], Johnston 2006 [+], Mackett 2005 [+]) and 1 nRCT (Mendoza 2009 [+]) suggests that walking school bus interventions may be effective in increasing levels of walking at the school population level for children up to 30 months post intervention.

Bickerstaff 2000 (BA [+] UK n=309, 14 months) [*walking school buses supported by environmental interventions such as street lighting on walking routes*]. Participants walking increased from 60% to 68.3%, 25% of that was due to walking buses.
Johnston 2006 (nRCT [+] USA n=3 primary schools, follow up 6 months after baseline) [*Walking School Bus (WSB). The school implemented three routes staffed by parent volunteers, and were compared to two nearby schools without a WSB*]. The number of children who walked to school increased from baseline to follow up by 25% (from 19%-26%). Comparison schools showed a decrease in the proportion of children walking to school over the same period (no data given)
Mackett 2005 (BA [+] UK n=64, 18-30 months) [*Walking buses at 5 schools. Information sent home to parents to encourage participation*]. There was an overall average increase of 513 metres walked per day. For children that had previously walked to school the WSB resulted in an average increase of only 19 metres/day, for those that previously travelled to school by a mixture of car and walking: average increase of 309 metres/day and for those that previously regularly travelled by car to get to school: average increase of 1,549 metres/day (no statistical analyses reported). Participation in the walking buses declined over time.
Mendoza 2009 (nRCT [+] USA n=643, 12 months) [*Walking School Bus (WSB) run by a part time co-ordinator and parent volunteers. The intervention included three routes which ranged from 0.3 to 1.5 miles and took 15-40 minutes. The WSB operated once or twice a week.*]. Higher proportions of students walked to the intervention (25% +/- 2%) verses the control schools (7% +/-1%): $p<0.001$. Significant increase in walking to school in intervention school from 20% (+/-2%) at baseline.

The evidence on school based walking sessions to increase walking is partially applicable to the UK as 2 studies were conducted in the UK. The differing environment in the USA must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 10B. SCHOOL BASED INTERVENTIONS USING PEDOMETERS TO INCREASE WALKING

Moderate evidence from 1 cluster RCT (Schofield 2005 [+]) and 1 ITS (Cirignano 2010 [+]) suggests that school based walking interventions which incorporate pedometers may be effective in increasing levels of walking at the school population level for children up to 12 weeks post intervention.

Cirignano 2010 (ITS [+] USA n=169, 6 weeks) [*pedometers and a "Fit Bits" programme to implement physical activity breaks in the classroom*]. Mean steps increased from 19,149 (95%CI 18,224–20,073) week 1 to 21,248 (95%CI 19,730-22,765) week 6: $p<0.001$. Overall walking peaked at week 3; and younger students had a stronger response to the intervention.

Schofield 2005 (Cluster RCT [+] NZ n=85, 12 weeks) [*physical activity self monitoring and educative programme. The PED group set daily step targets, and the MIN group set daily time based activity goals*]. Both intervention groups had significant increase in steps between baseline and week 12: p<0.001, no significant differences between time points for the control group: p=0.23.

The evidence on school based walking sessions to increase walking is only partially applicable to the UK as studies were undertaken in the USA and New Zealand. The differing environments in these countries must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 10C. SCHOOL BASED WALKING SESSION INTERVENTIONS TO INCREASE WALKING

Inconsistent evidence from 5 studies (reported in 6 papers) on the effectiveness of school based walking session interventions in increasing levels of walking at the school population level for children up to 48 months post intervention. Evidence from 1 nRCT (McKee 2007 [+]),and 2 BA studies (reported in 3 papers: Cairns 2006b [+], Cairns 2006c [+], Zaccari 2003 [+]) showed positive effects on school population walking. However one nRCT showed no effect on walking (TAPESTRY 2003 [+]) and 1 Cluster RCT (Wen 2008 [+]) had conflicting evidence concerning the intervention effect on walking for school travel.

Cairns 2006b (BA [+] UK n=585, 48 months) ["*Walk on Tuesday and Thursday" WOTT, encouraged walking to school, included incentives*]. Walking to school increased from 53.3% to 58.7% (percentages only reported). Also reported in **Cairns 2006c** (BA [+])
McKee 2007 (nRCT [+] UK n=60, 10 weeks) [*School based active travel project. Active travel was integrated into the curriculum, and participants used interactive travel planning resources at home*]. Mean distance travelled to school by walking increased significantly more in the intervention (389%) than the control (17%): t(38)=-4.679, p<0.001, 95% CI -315 to -795m.
TAPESTRY 2003 (nRCT [+] UK n=13 schools, 4 weeks) [*Interventions linked to national walk to school week*]. No difference between intervention and control schools in walking before or after the intervention.
Wen 2008 (Cluster RCT [+] Aus n=24 schools, 2 months) [*Health Promoting Schools Policy: classroom activities, pedometer based walking activities (some schools) development of school Travel Access Guides, parent newsletters, and improving environments with local councils*]. Based on student survey data while both intervention and control groups increased walking by about 4% from baseline, there was no statistically significant difference in mean percentages of change in mode of transport to or from school from baseline to follow up between the intervention and control groups (no data given); but parent survey data (n=807) indicated a significant increase in walking trips by students in the intervention compared to control schools (28.8% vs 19%, p=0.05).
Zaccari 2003 (BA [+] Aus n=234, 4 weeks) [*Classroom activities supported by a weekly newsletter to encourage walking to school*]. Percentage of walking trips increased by 3.4% and car trips decreased by 3.4%.

The evidence on school based walking sessions to increase walking is partially applicable to the UK as 3 studies were conducted in the UK. The differing

environments in Australia must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 11. POPULATION LEVEL CHANGE IN WORKPLACE BASED INTERVENTIONS TO INCREASE INDEPENDENT WALKING & CYCLING

Weak evidence from 1 BA study (Bull 2008 [+]) and 1 ITS (Brockman 2011 [+]) indicates that multi-component interventions delivered in the workplace are effective in increasing population levels of walking and cycling

Brockman 2011 (ITS [+] UK n=1850 to 2829 in each of 4 staff surveys, 9 years) [*University transport plan: limiting the number of available parking spaces and permits, improving changing, installing secure cycle storage, subsidised cycle purchase scheme, car share scheme, free bus travel, and discounted season tickets*]. Respondents who usually walked to work increased from 19 to 30%: Z=4.24, p<0.001, and regular cyclists increased from 7.0% to 11.8% (not significant).
Bull 2008 (BA [+] UK n=2240, 3 years) [*Well@Work programmes which consisted of a diverse set of initiatives and actions aimed at promoting and supporting healthy lifestyles*.]. Increase of 9% in the proportion of employees participating in active travel (walking or cycling), significant increase in employees cycling (4%) or walking (8%) to work.

The population level evidence on multi-component interventions to increase walking and cycling in adults is applicable to the UK as both studies were conducted in the UK. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

INDIVIDUAL LEVEL CHANGE

EVIDENCE STATEMENT 12: INDIVIDUAL LEVEL CHANGE FROM PARTICIPATION EVENT TO INCREASE CYCLING

Weak evidence from one study suggests that a mass participation intervention may be effective in increase individual level cycling for leisure in adults. Evidence from one BA study (Bowles 2006 [+]) showed a positive effect on cycling one month after the intervention.

Bowles 2006 (BA [+] Aus n=918, 2 months) [*mass cycling event*]. Participants with low pre-event self reported cycling ability reported an average of 4 sessions of cycling in the month before the event and an average of 6.8 sessions in the month after the event (t=5.25, p<0.001).

The evidence on mass participation event intervention to increase cycling is only partially applicable to the UK as the study was conducted in Australia. The differing environment in Australia must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 13. INDIVIDUAL LEVEL CHANGE IN COMMUNITY DELIVERED TARGETED HEALTH INFORMATION INTERVENTIONS TO INCREASE WALKING

Moderate evidence from 6 studies suggests that individual, targeted provision of health information (including printed media, telephone support and text messages) delivered in the community are effective in increasing individual levels of walking for leisure or travel in adults up to one year post intervention. Five RCTs showed positive effects on walking (Dunton 2008 [++], Humpel 2004 [++], Nies 2003 [++], Nies 2006 [++], Prestwich 2010 [++]). One further RCT (Rovniak 2005 [++]) also showed positive effects on walking, but was designed to test intervention fidelity.

Dunton 2008 (RCT [++] USA n=117, 3 months) [10 *weekly emails containing links to a webpage with an interactive information tailoring tool to promote physical activity*]. Walking increased at a faster rate in the intervention group than the control group: β=15.04 (SE=8.38), p=.035 (one-tailed).Intervention group increased walking by 69 mins/week vs 32 min/week in control;
Humpel 2004 (RCT [++] Aus n=399, 10 weeks) [*Print only (participants were mailed self-help brochures weekly for 3 weeks) or Print plus Telephone (participants received the same print program plus three weekly telephone support calls*]. Both intervention groups significantly increased time reported walking for exercise per week: from 130 to 147 minutes: t(1,277)=-3.50, p<0.001; and from 132 to 150 minutes, t(1,106)=-2.44, p=0.016.
Nies 2003 (RCT [++] USA n=197, 6 months) Counselling [*weekly telephone calls to assess physical activity levels and problem solve how to fit adequate walking activity into their week.*]. Women in the intervention group reported more time walked each day than the control women: F (1,191)=4.10, p<0.05.
Nies 2006 (RCT [++] USA n=253, 12 months) [*telephone calls with or without counselling, or a control video*]. Women in intervention group showed a linear increase in walking from baseline to 6 months (latent growth analysis to assess the relationship between time and intervention group membership).
Prestwich 2010 (RCT [++] UK n=149, 4 weeks) [*Two theory-based interventions consisting of forming "implementation intentions" along with text message reminders to achieve walking-related plans or goals*]. Differential change across groups in brisk walking or fast walking F(2,130)= 3.12, p=0.048. 2 intervention groups which differed in having a plan reminder or goal reminder had a 45% and 42% increase of at least 2 days a week meeting PA daily guidelines respectively, with a 22% increase in the control group.
Rovniak 2005 (RCT [++] USA n=50, 12 months) [*two interventions consisting of forming "implementation intentions" along with text message reminders to achieve walking-related plans or goals using social cognitive theory (SCT): mastery*]. Greatest increase in walking in Interventions that adhered more closely to SCT. High fidelity intervention increased walking by 34.23min/week +/-81.91 compared to a low fidelity increase of 7.91min/week +/-47.93, F=3.207 p=0.08.

The evidence on community delivered health information interventions is only partially applicable to the UK as most studies were conducted in Australia or the USA with only one UK study included. The differing environment in Australia and the USA must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

Note: pedometers are a technology which offers an opportunity to present individualised information about walking and so are closely linked to the studies above. Use of pedometers is related to goal setting and monitoring rather than to delivery of information about health benefits or methods to overcome barriers. Studies may use pedometers as one of a number of factors to support increases in walking, in common with other approaches, or may use pedometers solely as a means of measuring change. Pedometer studies are considered below.

EVIDENCE STATEMENT 14: INDIVIDUAL LEVEL CHANGE IN COMMUNITY BASED PEDOMETER INTERVENTIONS TO INCREASE WALKING

Moderate evidence from 12 studies suggests that pedometer based interventions delivered in the community are effective in adults (or women only) to increase individual levels of walking for leisure or travel, up to 6 months post intervention. Evidence from 5 RCT (Baker 2008b, Darker 2010 [++], Koizumi 2009 [++], Merom 2007 [++], Pal 2009 [++]) and 2 BA study (Miyazaki 2011 [+], Rosenberg 2009 [-]) showed positive effects on walking for leisure and/or travel in adults. This is supported by data from a CS study (Ryder 2009 [-]); however 1 RCT (Baker 2011 [++]) found that short-term improvements in walking 4 weeks post intervention had decreased by 12 months follow-up. Evidence from 1 RCT (Moreau 2001 [++]) and 1 BA study (Dinger 2005 [+]) showed substantial positive effects on walking for leisure and/or travel in women. An additional RCT (Merom 2009 [++]) found that a pedometer-based intervention increased walking in environments with low aesthetics, but not in those with aesthetically pleasing environments.

Baker 2008b (RCT [++] UK n=79 12 weeks) [*The sessions were based on the Transtheoretical Model of exercise behaviour change. Strategies used included enhancing motivation, overcoming barriers and developing appropriate walking plans. Followed a 12-week pedometer-based walking program*]. Significant increase in steps/day for the intervention group between baseline (M=6802, SD=3212) and week 12 (M=9977, SD=4669, t(38)=-6.06, p<0.001, d=0.79, CI 2,115–4236). No significant difference was observed in the control group (t(39)= -0.50, p=0.618, CI -463–770).

Baker 2011 (RCT [++] UK n=61, 52 weeks) [*walking programme with goals set in minutes, or steps or using a pedometer*]. Pedometer group increased walking at 4 weeks (p<0.001), but decreased between 4 weeks and 12 months. No change in minutes or control groups.

Darker 2010 (RCT [++] UK n=130, 4 weeks) [*Motivational component had 3 stages: participants were shown 10 statements about what would make it easier for them to walk more, asked to complete a scale to show how confident they would be about walking in each situation, and discussed with facilitator and walking plan developed. Pedometers were worn*]. Significant difference in number of minutes spent walking to week 2 between the control group (M=138.7, SD=93.3) and the intervention group (M=22.5 SD=100.3), from a mean of 19.8min to 32.2min per day (increase of over 60%). Also a significant increase in number of minutes spent walking per week for intervention group week 1- week 4 (mean 287.3, SD=129.4) [t(46)=8.12, p<0.001).

Dinger 2005 (BA [+] USA n=36, 6 weeks) [*Women who were designated as insufficiently active were given brochures and pedometers and were sent emails. Participants received a pedometer, 6 weeks of step log sheets, self addressed envelopes, and three commercial brochures describing strategies based on trans-theoreticalmodel (TTM) for increasing physical activity and the risks and benefits of*

physical activity]. Participants significantly increased their total walking minutes from baseline (median 55) to post intervention (median 245): Z=4.03, p=0.001; including walking whilst at work (Z=2.79, p=0.005, d=0.63), for transport (Z=2.86, p=0.004, d=0.60) and during leisure time (Z=3.54, p=0.001, d=0.81).

Koizumi 2009 (RCT [++] Japan n=68,12 weeks) [*Feedback based on accelerometer daily physical activity, number of daily steps and time spent performing daily moderate physical activity (MPA) which was provided to each participant every two weeks. Participants were recommended to accumulate 9000 steps and 30 minutes of MPA per day*]. Significant group interaction was observed for steps: f=10.53, p<0.01. The intervention group increased their steps by 16% (7811 +/-3268 to 9046 +/-2620 steps). There was no significant change in the control group.

Merom 2007 (RCT [++] Aus n=314, 3 months) [*Self-help booklet based on social cognitive theory constructs, plus six weekly diaries printed on reply-paid postcards (WP group), plus a pedometer (WPP group). Three incremental stages, starting with short walks (<15 minutes) three days a week, typically by incidental walking, gradually increasing the duration of walks to three to four days, then (continuously) walking briskly for 30 minutes*]. Mean change in total sessions of all-purpose walking/week increased within all groups from baseline, but increased the most within WPP (control group had a mean increase of 1.2 sessions/week (95% CI: 0.6-1.8), t=3.97, p<0.001; WP: 1.3 sessions/week (0.5-2.0), t=3.32, p<0.001; WPP: 2.3 sessions/week (1.6-3.1), t=6.30, p<0.001). Leisure time walking sessions/week for the previous 3 months also increased within all groups, with both WP (2.0 sessions/week (1.6-2.4), t=9.49, p<0.001) and WPP (2.1 sessions/week (1.7-2.6), t=9.63, p<0.001) showing a significantly larger increase than the control group (0.9 sessions/week (0.6-1.2), t=5.82, p<0.001). There was a similar pattern for Leisure time walking minutes/week for the previous 3 months, but only the WPP group (66 minutes/week (50-82), t=8.05, p<0.001) showed a significant increase compared to the control group (34 minutes/week (21-48), t=5.03, p<0.001). The WPP group was also more likely than controls to meet physical activity recommendations. Unclear if the provision of pedometers provides benefit over and above standardized structure walking programme.

Merom 2009 (RCT [++] Aus n=369, 3 months) [*participants received a single mail-out of a self-help walking program (WP) or the same program plus a pedometer (WPP)*]. Only the WPP group were significantly more likely than controls to increase total walking time (Exp (b) = 2.53, p<0.01) and to undertake regular walking (OR=5.85, 95% CI 2.60–12.2) where environment aesthetics (level of greenery and interesting scenery) were perceived to be low; while in aesthetically pleasing environments, the differences in walking measures between intervention and control groups were non-significant.

Miyazaki 2011 (BA [+] Japan n=56, 4 months) [*Subjects were given a pedometer and instructed to walk at least 7,500 steps each day. They were also given additional monthly advice on healthy diet and lifestyle provided in a newsletter*]. Mean steps per day increased significantly from 9389 to 11846: p<0.01.

Moreau 2001 (RCT [++] USA n=24, 24 weeks) [*Given pedometer and initially, all (post menopausal) women were prescribed a distance of 1.4 km/day above their baseline. Distance was then increased by 0.5 km/day until the desired walking distance was met*]. Intervention group increased their daily walking by 4300 steps (2.9 ± 0.2 km/day); significantly different from baseline and from the control group: both p<0.05.

Pal 2009 (RCT [++] Aus n=26, 12 weeks) [*Participants (overweight middle aged women) in the pedometer group were told to record their pedometer steps on a daily basis for 12 weeks; those in the control group were asked to wear a sealed pedometer for 12 weeks with weekly recording. The pedometer group was also encouraged to reach a daily step goal of 10,000 steps/day*]. Pedometer group daily average number of steps at weeks 6 (8321 ± 884 steps/day) and 12 (9703 ± 921

steps/day) were significantly higher than the baseline daily average of 6242 ± 541 steps/day: p=0.046 and p=0.035, respectively.
Rosenberg 2009 (BA [-]) USA n=12, 2 weeks) [*participants: over 65 years of age; site-specific walking route maps, health counselling session with individualized goal setting and pedometers*] Average daily pedometer steps increased between baseline (M=3020, SD=1858) and Week 1 (M=4314, SD=2627; t(11)=-2.99, p=0.012) and Week 2 (M=4246, SD=2331; t(11)=3.42, p=0.006). All participants met their daily step goals in Week 1 while 50% met their step goals in Week 2.
Ryder 2009 (CS [-] Canada n=41, 6 months) [*Lending pedometers to patrons of 5 public libraries. The pedometers were loaned for maximum of 9 weeks. Education packages were handed out with pedometer including: info on pedometer use, physical activity/walking recommendations, maps of local trails, and a Walking Challenge Questionnaire*]. 39.5% indicated they walked more since borrowing the pedometer and 60.5% reported walking about the same.

The evidence on community pedometer interventions to increase walking is only partially applicable to the UK. Three studies were conducted in the UK, with the majority in the USA, Australian, Canada, and Japan. The differing environments must be considered in reference to the studies, particularly for those conducted in Japan. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 15: INDIVIDUAL LEVEL CHANGE IN WORKPLACE PEDOMETER INTERVENTIONS TO INCREASE WALKING

Moderate evidence from 11 studies suggests that pedometer based interventions delivered in the workplace may be effective in increasing individual levels of walking for leisure or travel, up to 12 months post intervention. Evidence from 3 RCTs (Gilson 2007 [++], Gilson 2009 [++], Spence 2009 [++]), 1 nRCT (Dinger 2007 [+]), 2 BA (Jackson 2008 [+], Warren 2010 [+]) and 2 ITS study (Faghri 2008 [+], Chan 2004 [+]) showed positive effects on walking for leisure and/or travel in the short-term (up to 12 weeks); however 1 ITS study (Behrens 2007 [+]) which used a competition format saw the initial increase in walking decline over 12 weeks. 1 nRCT (Borg 2010 [+]) found significant increases in walking 12 months after the intervention, while another RCT (Baker 2008a [++]) found that initial increase in walking declined by 52 weeks follow-up.

Baker 2008a (RCT [++] UK n=50, 52 weeks) [*walking programme with goals set in steps using an open pedometer for feedback*]. Both groups significantly increased step counts from baseline to week 4. Significantly greater number of participants in the intervention (77%) compared with the control (54%) achieved their week 4 goals (X2= 4.752, p=0.03). There was no significant change in step counts from week 4 to 16 and a significant decrease from week 16 to 52.
Behrens 2007 (ITS [+] USA n=640 (in 64 teams of 10), 12 weeks) [*Competition based employer sponsored physical activity programme using pedometers. Employees formed groups of 10 to undertake the challenge of attaining 10,000 steps per participant per day*]. Total weekly steps for all teams combined increased between weeks 1 and 8 (p<0.0001), but declined from week 9-12. Increase in total weekly step count between week 1 and 12 not significant. Significant difference in team steps, with post hoc comparisons indicating significant differences from baseline step counts during weeks 6-8: F=71.15, p<0.001, but not at the end of the programme.

Borg 2010 (nRCT [+] Aus n=205, 12 months) [*Staff define as inactive received three month self help walking programme and pedometer plus four maintenance newsletters over nine months to assist them to maintain their new activity levels. Control received pedometer and programme but no maintenance*]. Both intervention groups significantly increased minutes walking (p=0.01). Change in MVPA minutes was significantly higher in the standard+maintenance group compared with the standard group (118 min vs 69 min, P=0.029). No significant between group differences were observed for total PA (161 min vs 117 min, P=0.187).

Chan 2004 (ITS [+] Canada n=106, 12 weeks) [*Adoption phase: participants met in workplace-based groups with a facilitator for 30–60 minutes each week during a lunch break. Set individual steps per day goals and self-monitored their progress using a pedometer to record daily accumulated steps taken. Then adherence measured for 8 weeks*]. Steps per day increased from 7,029 +/- 3,100 (SD) at baseline to a plateau of 10,480 +/- 3,224 steps/day by 3.96 +/- 3.28 weeks of the intervention. Some decreases in activity relative to baseline steps per day, ranging from -2.4% to -20.6% (12.0% ± 7.6%).

Dinger 2007 (nRCT [+] Aus n=N56, 6 weeks) [*The intervention group received a pedometer and step logs. Set a daily step goal based on the previous week's step counts. They received weekly email reminders to wear the pedometer and return that week's log. Also received three commercial brochures. Control group received intervention but without commercial brochures, intervention emails contained TTM based strategies*]. Daily steps increased significantly from 6419 ± 2386 during week 1 to 7984 ± 2742 during week 6: p<0.001 for both groups combined. Increases did not differ between groups.

Faghri 2008 (ITS [+] USA n=206, 10 weeks) [*Each day participants put on pedometers upon arriving at work, prior to getting out of their cars. To increase motivation, participants were encouraged to develop teams, and each team chose a team leader. Weekly motivational emails were sent to participants*]. Significant increase in the number of steps per week for weeks 2, 3, 4, 6 and 8 compared to baseline: p=0.001.

Gilson 2007 (RCT [++] UK n=64, 10 weeks) [*Walking Routes which employed prescribed walks around campus with participants asked to complete at least 15min continuous brisk walking every day and Walking in Task which encouraged the accumulation of step counts through the working day*]. Decrease in steps for the control group (-767 steps/day) and increases in intervention groups for walking routes (+926 steps/day) and walking in tasks (+997 steps/day). Control vs. walking routes p<0.008, control vs. walking in tasks p<0.005.

Gilson 2009 (RCT [++] UK, Aus, and Spain n=64,70 & 80 respectively, 10 weeks) [*Participants in the first intervention group were directed to achieve this through brisk, sustained, route-based walking during work breaks. The second intervention group was asked to engage in incidental walking and accumulate step counts during working tasks, both groups were instructed to use pedometers to motivate and regulate walking*]. Average step count data decrease in the control group: -391 steps/day t=1.76; p <0.08, and significant increases in both the routes: 968 steps/day; t=3.9; p<0.001, and the incidental 699 steps/day; t=2.5; p<0.014 group.

Jackson 2008 (BA [+] USA n=290, 12 weeks) [*Participants wore a pedometer at least 5 days per week for 12 weeks and completed questionnaires assessing demographic information. After baseline (week 1) they were given suggested number of steps to meet recommendations, instructions for goal setting and other behaviour change strategies to gradually increase number of daily steps*]. Average number of steps increased from week 1 to week 6: p<0.001; and week 12: p=0.002

Spence 2009 (RCT [++] Canada n=63, 1 week) [*Intervention group pedometer was worn for one week for all waking hours to encourage walking. Control (non-pedometer) participants were informed they could wear a pedometer the following*

week]. Compared to the no pedometer group, the pedometer group reported more walking: F=5.22, p=0.03.
Warren 2010 (BA [+] USA n=188, 10 weeks) [*Participants were provided with pedometers and given personalised daily and weekly step goals over the 10 week intervention. Local strategies available to the participants included walking groups, marked walking circuits and posted walking maps*]. Mean increase of 1503 steps (38% increase over baseline). Mean weekly step counts values for all intervention weeks were significantly higher than baseline: p<0.01.

The evidence on workplace pedometer interventions to increase walking is partially applicable to the UK. Three studies were conducted in the UK but most studies were conducted abroad - in USA, Australia, Canada or Spain – which may limit the applicability in some cases. The differing environments must be considered in reference to the studies. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 16. INDIVIDUAL LEVEL CHANGE IN WORKPLACE DELIVERED TARGETED HEALTH INFORMATION INTERVENTIONS TO INCREASE WALKING

Weak evidence from two studies suggests that individual, targeted provision of health information delivered in the workplace (including flyers, email, telephone calls, website postings, and information booths) may be effective in increasing individual levels of walking for leisure or travel in adults up to 24 weeks post intervention. One RCT study (Lombard 1995 [+]) showed a positive effect on walking and one BA study (Napolitano 2006 [+]) showed a small (borderline significance) positive effect on walking.

Lombard 1995 (RCT [+] USA n=135, 24 weeks) [*phone calls once a week versus every 3 weeks, and structured vs. non structured feedback*]. Survival curves indicated that there was a significant effect on walking for treated (the combined four treatment conditions) versus the control condition, LD= 17.661 p<0.001 and for frequency of prompting (those prompted once a week against every three weeks), LD = 17.719, p<0.0001).
Napolitano 2006 (BA [+] USA , n=not reported, 2 weeks) [*Promotional material distributed via flyers, email, website postings, and during bi-weekly information booths*]. Borderline statistically significant increases in walking counts on Path to Health from baseline midway through the campaign (p=0.069) and following the campaign: p=0.075 (p values only reported).

The evidence on workplace health information interventions is only partially applicable to the UK as the studies were conducted in the USA. The differing environment in the USA must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 17: INDIVIDUAL LEVEL CHANGE IN WORKPLACE DELIVERED TARGETED HEALTH INFORMATION INTERVENTIONS TO INCREASE WALKING AND CYCLING

Moderate evidence from one RCT study (Mutrie 2002 [++]) suggests that individual, targeted provision of health information (including a booklet of interactive materials, social marketing and individualised marketing strategies) in the workplace may be effective in increasing individual levels of walking, but not cycling, for travel in adults for up to 6 months post intervention. [See also, TravelSmart, ES7A].

Mutrie 2002 (RCT [++] UK n=295, 6 months) [*interactive materials* based on *the transtheoretical model of behaviour change: choosing routes, maintaining personal safety, shower and safe cycle storage information, and useful contacts*]. Significant increase in time per week spent walking to work (mean 125 min/week intervention vs. 61 min/week control), but no difference in average weekly minutes of cycling between cyclists in the intervention group (n=9) and control group (n=9).

The evidence on health information intervention to increase walking and cycling is applicable to the UK as the study was conducted in the UK. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 18: INDIVIDUAL LEVEL CHANGE IN MULTI-COMPONENT INTERVENTIONS TO INCREASE WALKING

Weak evidence from two BA studies (Clarke 2007 [+], Krieger 2009 [+]) suggests that multi-component interventions have a positive effective on increasing individual levels of walking for leisure or travel up to three months post intervention.

Clarke 2007 (BA [+] USA n=124, 8 weeks) [*multi physical activity and dietary program, pedometers*]. Post intervention, 46.2% (n=43) met the 10,000 steps/day criteria for high activity (no further statistics). This increased from 11.8% at baseline. Average steps increased from 5,969stpes/day to 9,757 steps/day ($p<0.05$)
Krieger 2009 (BA [+] USA n=53, 3 months) [*sponsored walking groups, improving walking routes, providing information about walking options, and advocating for pedestrian* safety]. Self reported walking activity increased from 65 to 109 minutes per day (44.1% increase, 95% CI= 28.0-60.2, p=0.001). The proportion that reported being at least moderately active for at least 150 minutes per week increased from 62% to 81% (19.2 % increase 95% CI= 2.2, 36.3 P=.018).

The individual level evidence on multi-component interventions to increase walking is only partially applicable to the UK as studies were conducted in the USA. The differing environment in the USA must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 19: INDIVIDUAL LEVEL CHANGE FROM CYCLE TRAINING INTERVENTIONS TO INCREASE CYCLING

Weak evidence from one BA study (Telfer 2006 [+]) suggests that cycle training interventions may be effective in increasing individual levels of cycling for

active travel amongst those not cycling at baseline, up to 2 months post intervention.

Telfer 2006 (BA [+] Aus n=81, 2 months) [*practical skills development and supervised on road or cycle path training. Free courses for beginner and intermediate level cyclists were conducted. Promoted through flyers, posters, media releases, articles and TV and newspaper adverts*]. Non cyclists at baseline reported significant increase (p<0.001) in minutes cycling.

The individual level evidence on multi-component interventions to increase cycling is only partially applicable to the UK as the study was conducted in Australia. The differing environment in Australia must be considered in all studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 20: INDIVIDUAL LEVEL CHANGE IN HEALTHCARE DELIVERED MULTI-COMPONENT INTERVENTIONS TO INCREASE BOTH WALKING AND CYCLING IN ADULTS

Moderate evidence from 1 RCT study (Hemmingsson 2009 [++]) concerning the effect of multi-component interventions on increasing individual levels of both walking and cycling for travel and/or leisure up to 18 months post intervention indicats a positive effect on cycling but no effect on walking.

Hemmingsson 2009 (RCT [++] Sweden n=120, 18 months) [*Physician meetings, physical activity prescriptions, group counselling, and bicycle provision; control and intervention groups received pedometers*]. Intervention group were more likely to achieve recommended level of cycling than controls: 38.7% vs. 8.9% (OR=7.8, 95%CI 4.0-15.0, p<0.001), but there was no difference in compliance with the walking recommendation: 45.7 vs. 39.3% (OR 1.2, 95%CI 0.7-2.0, p=0.5). Commuting by car and public transport were reduced by 34% (P<0.01) and 37% (P<0.001), respectively in the whole sample, with no differences between groups

The individual level evidence on multi-component interventions to increase walking and cycling in adults is only partially applicable to the UK as the study was conducted in Sweden. The differing environment in Sweden must be considered in reference to this study. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 21. INDIVIDUAL LEVEL CHANGE IN COMMUNITY BASED LED WALKING GROUP INTERVENTIONS TO INCREASE WALKING

Inconsistent evidence from 5 studies on the effects of a community-based led walking group interventions on walking. 1 RCT (McAuley 1994 [++]), 1 clustered RCT (Fisher 2004 [++]), 1 nRCT (CLES 2011[++]) and 1 BA study (Jancey 2008 [+]) showed positive effects on walking from community-based walking group interventions; but evidence from a further RCT (Lamb 2002 [++]) showed no difference between groups at 12 months.

CLES 2011 (nRCT [++] UK n=7883, 12 weeks) *["Get walking, keep walking": Bespoke, led walks and sessions aimed at encouraging children and young people to walk*]. 67% of participants increased the amount of exercise they did each week.

Walking from "place to place" increased by 1.1 day/week and walking for leisure by 1 day/week.
Fisher 2004 (Cluster RCT [++] USA n=501, 6 months) [*Leader-led walking group activity or an information-only control group*]. Significant increase observed in walking activity: p <0.05.
Jancey 2008 (BA [+] Aus n=169, 6 months) [*Walk leaders received a prescriptive progressive weekly exercise program guided by social cognitive theory, that contained written information on the appropriate length for the walking program; stretching exercises; and ball skills, such as side twist leader ball, participants aged 65-74*]. Baseline mean walking time for recreation was one hour (SD =1.65), increasing to 2.69 hours (SD =2.02) per week by the end of the program.
Lamb 2002 (RCT [++] UK n=260, 12 months) [*Accompanied walks were provided at several different times in the day and evening, during the week and at weekends, and were led by lay volunteers*]. At 12 months, although both walking and control groups increased activity (by 35.7% and 22.6% respectively; 95% CI 0.003% to 25.9%) p=0.05), there was no significant difference between them.
McAuley 1994 (RCT [++] USA n=114, 20 weeks) [Efficacy based *Exercise classes were conducted by trained exercise specialists and employed brisk walking as the aerobic component*]. At the end of the 20 week program, subjects in the intervention group walked more miles per week than the control group: p<0.05.Intervention group subjects also walked more often (p<0.01) and accumulated more minutes (p<0.01) than control

The evidence on community based walking group sessions to increase walking is only partially applicable to the UK as only two studies were conducted in the UK. The differing environment in the USA and Australia must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 22. INDIVIDUAL LEVEL CHANGE IN INTERVENTIONS TO INCREASE INDEPENDENT COMMUNITY BASED WALKING

Weak evidence from 2 BA studies (Culos-Reed 2008 [+], Mier 2011 [+]) and 1 RCT (Fjeldsoe 2010 [+]) suggests that interventions to increase independent community based walking may be effective in increasing individual walking for leisure, exercise or travel up to 13 weeks post intervention in adults or the whole community.

Culos-Reed 2008 (BA [+] Canada n=39, 8 weeks) ["*mall walking programme", participants provided with pedometers. Participants self selected the pace, time, and frequency of walking. Encouraged to attend as often as possible between 8am and 10am Monday to Friday*]. Average daily mall walk steps increased from 5055 (SD 1374) to 5969 (SD 1543): p=0.002, and average daily mall walk time increased from 42.9 (SD 10.6) min to 50.4 (SD 13.5) min: p=0.002.
Fjeldsoe 2010 (RCT [+] Aus n=88, 13 weeks) [*participants: post-natal women; information, goal setting consultations, activity and self-monitoring daily planner, tailored SMS, nominated social support person*]. Frequency of walking for exercise (days/week) increased over time in the intervention compared to control group (time×group interaction effect F(2,85)=5.38, p=0.023, medium effect size partial η^2=0.06); while change in duration of walking did not show a significant time×group interaction effect (p=0.081; effect size partial η^2=0.05), there was a significant group effect with increases in walking duration in the intervention compared to control (p=0.005; medium to large effect size partial η^2=0.09).

Mier 2011 (BA [+] USA n=16, 12 weeks) [*Walking intervention facilitated by community health workers. Weekly sessions encouraged participants to accumulate at least 30 min of moderate intensity walking on most/all days of the week*]. Exposure to the programme resulted in significant increase in walking: 915.8 metabolic equivalent min/week, p=0.002.

The evidence on interventions to increase independent community based walking may not be applicable to the UK as studies were conducted in the USA and Canada. The differing environment in the USA must be considered in reference to the studies conducted there. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

EVIDENCE STATEMENT 23. INDIVIDUAL LEVEL CHANGE IN WORKPLACE BASED INTERVENTIONS TO INCREASE INDEPENDENT WALKING

Inconsistent evidence from 2 RCT studies concerning workplace walking session interventions' (conducted in universities) effectiveness in increasing individual levels of walking for staff and/or student participants up to 12 months post intervention. Evidence from 1 RCT (Coleman 1999 [++]) showed positive effects on walking while one RCT (Eastep 2004 [++]) showed no effect on walking.

Coleman 1999 (RCT [++] USA n=32, 32 weeks) [*Sedentary adults; walking presecription: three brisk walking conditions: 30 continuous minutes, three 10-minute bouts, or 30 minutes made up of any combination of bouts each at least 5 minutes long*; *1 hour information & modelling session followed by weekly meetings with an activity counsellor for 15 weeks. Behavioural methods used to promote adherence: goal setting and mastery, self-management techniques, weekly personal feedback, problem solving, behavioural contracting Participants paid $50, refunded on successful completion*]. Self-reported walking for all intervention groups significantly increased throughout the program: $F(6, 186)= 26.16$; $p<0.001$.
Eastep 2004 (RCT [++] USA n=26, 6 weeks) [*Two eight week walking for fitness classes*]. Neither group increased walking time or number of steps significantly over time.

The evidence on workplace (university) based walking sessions to increase walking is only partially applicable to the UK as the studies were conducted in the USA. The differing environments must be considered in reference to the studies conducted in the USA. Individual local contexts as well as the setting will also impact on the applicability of individual studies.

PROCESS

The Walking & Cycling Programme Development Group (PDG) did not feel confident in the content of the effectiveness review submitted by ScHARR and suggested that

- the strength of evidence in some evidence statements should be changed,
- some studies would be more appropriate in different evidence statements
- some evidence statements should be deleted or information merged with other existing evidence statements
- some study details were not correctly reported
- some studies should be excluded on the basis of reporting outcomes not directly reflecting changes in walking and/or cycling.

ScHARR was provided with a tracked change document detailing changes suggested by the PDG. ScHARR did not feel these changes were necessary/appropriate. As the PDG were not willing to “sign off” on the ScHARR version of the effectiveness review NICE analysts reviewed the full papers of included and excluded studies to enable corrections and alterations to be made. As a result, two sets of evidence statements are open to public consultation. This version of the evidence statements is the one used by the PDG in developing the guidance recommendations.

The process of reviewing the evidence statement and tables has involved going back to full papers. However for a number of studies this has not been possible. Full papers for the following studies have not been reviewed

Bull, F.C.L. Adams, E.J. & Hooper, P.L. (2008). Project Evaluation Report - Well@Work - Newham University Hospital NHS Trust

Eastep E, Beveridge S, Eisenman P, Ransdell L, Shultz B. Does Augmented Feedback From Pedometers Increase Adults' Walking Behavior? Perceptual and Motor Skills 2004; 99(2).

Miyazaki, R, Azuma, Y, Koyama, N, Yamatsu, K, Hayashi, K, Chiba, H, Ishii, K. Effects of a walking program using pedometers and newsletters for preventing lifestyle-related diseases of elderly men and women. Journal of Aging & Physical Activity 2011. 16: s170.

Ryder HH, Faloon KJ, Levesque L, McDonald D, Ryder HH, Faloon KJ et al. Partnering with libraries to promote walking among community-dwelling adults: a Kingston gets active pilot pedometer-lending project. Health Promot Praci 2009; 10(4):588-596.

In addition, full papers for the following studies have not been reviewed. The data for them has been taken from previous NICE guidance on physical activity and children (PH17)

Bickerstaff, K., Shaw, S. (2000). An evaluation of the Walking Bus at Pirehill First School. CAST: Staffordshire University.

Cairns, S., (2006a) Making School Travel Plans Work (Holmer Green First School), in Marsden, G.R. (ed) Wasted Miles, Wasted Money: A less congested, more energy efficient future, London: CICC Publications.

Cairns, S., (2006b) Making School Travel Plans Work (St Michael's Primary School), in Marsden, G.R. (ed) Wasted Miles, Wasted Money: A less congested, more energy efficient future, London: CICC Publications.

Cairns, S., (2006c) Making School Travel Plans Work (St Sebastian's Primary School and Nursery), in Marsden, G.R. (ed) Wasted Miles, Wasted Money: A less congested, more energy efficient future, London: CICC Publications.

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Baker G, Mutrie N, Lowry R. A comparison of goals set in steps using a pedometer and goals set in minutes: a randomised controlled trial. International journal of health promotion and education. 2011; 49 (2) 60-68

Behrens TK, Domina L, Fletcher GM, Behrens TK, Domina L, Fletcher GM. Evaluation of an employer-sponsored pedometer-based physical activity program. Percept Mot Skills 2007; 105(3 Pt 1):968-976.

Bickerstaff, K., Shaw, S. (2000). An evaluation of the Walking Bus at Pirehill First School. CAST: Staffordshire University.

Borg J, Merom D, Rissel C. Staff walking program: a quasi-experimental trial of maintenance newsletters to maintain walking following a pedometer program. HEALTH PROMOT J AUST 2010; no. 1(pp. 26-32).

Bowles HR, Rissel C, and Bauman A, Mass community cycling events: Who participates and is their behaviour influenced by participation? International Journal of Behavioral Nutrition and Physical Activity 2006; 3:39

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EVIDENCE TABLES FOR INCLUDED EFFECTIVENESS STUDIES

Key

Study designs:

RCT: randomised controlled trial (both before and after intervention and with concurrent control group: random allocation)

nRCT: non-randomised controlled trial (both before and after intervention and with concurrent control group: non random allocation)

BA: before and after study (before and after intervention without a concurrent control group)

ITS: interrupted time series (data taken at multiple time points before and after intervention without a concurrent control group)

CS: cross-sectional study (data collected at one time point only).

Study quality

[++]: All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions of the study or review are thought very unlikely to alter

[+]: Some of the criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are through unlikely to affect conclusions

[-]:Few or no criteria fulfilled. The conclusions of the study are thought likely or very likely to alter

First author and date Country Walking/ cycling	Study design Quality (++/+/-)	Population Sample size (n) Intervention/ Comparator size	Outcome measures	Intervention details Comparator details Duration and length of follow up	Methods and analysis	Main findings [Ideally report: Absolute effect intervention Absolute effect control Absolute difference (and CI)].	Recommendations/ limitations Other comments
Baker 2008a UK Walking	RCT [++]	50 participants (7 male, 43 female) Age 40.16 (SD 8.81) recruited from a university campus At week 16 N=30 At week 52 N=28	Steps taken Walking (minutes) Seven day recall of physical activity.	**Intervention details** Baseline (both groups); participants wore sealed pedometers for one week to record baseline rate of walking. At 16 and 52 week follow up, all participants wore sealed pedometers for seven days. Four week walking programme with goals set in steps using an open pedometer for feedback. Week 1 goal: 1,500 steps above baseline 3 days of week. Increased to 5 days for week 2. Week 3 goal: 3,000 steps above baseline 3 days of week, increased to 5 days for week 4. Step counts recorded at baseline, 1,2,3,4 weeks, 16 weeks and follow up at 52 weeks **Comparator details** Equivalent four week programme with goals set in minutes. Pedometers were sealed so no feedback was provided. Week one goal: 15 minutes above baseline. Increased to 5 days for week 2. Week 3 goal: 30 min above baseline 3 days of week, increased to 5 days for	Sample size of 52 was calculated to give power of 0.8.	Both groups significantly increased step counts from baseline to week 4 with no significant difference between groups. Significantly greater number of participants in the intervention (77%) compared with the control (54%) achieved their week 4 goals (X^2= 4.752, p=0.03). There was no significant change in step counts from week 4 to 16 and a significant decrease from week 16 to 52.	Additional support may be needed to sustain increases in walking.

				week 4. **Duration/length of follow up** 52 weeks.			
Baker 2008b UK Walking	RCT [++]	N=63 women and 16 men (49.2 years ± 8.8) Scottish community sample. Independently ambulatory, English speaking and between the ages of 18–65 years. Self-classified as not meeting current physical activity recommendations, The intervention group (n =	Physical Activity Steps/day and 7-day recall of physical (IPAQ). Health Related Outcomes Affect (an individual's feelings and emotions) was assessed using the Positive and Negative Affect Schedule (PANAS) EQ-5D instrument. (BMI) Waist-to-hip ratio Percentage body fat Blood pressure	**Intervention** The Walking for Well-being (WWW) All participants completed a baseline week wearing a pedometer, sealed with tape, for seven days with instructions not to alter their daily routine. Participants assigned to the intervention group received a physical activity consultation and then followed a 12-week pedometer-based walking program. The sessions were based on the Transtheoretical Model of exercise behaviour change (TTM Strategies used included enhancing motivation, overcoming barriers and developing appropriate walking plans which were tailored to the individual. The sessions also included discussion of the three mediators of the TTM that have been shown to be important to behaviour change. These are self-efficacy (confidence in ability to change), decisional balance (pros and cons of change) and processes of change (strategies and techniques used to change, e.g., social support).	Data were analyzed using SPSS v.14.0. All results reported were analysed by the main intervention groups. The analyses were performed on an intention to treat basis. Missing week 12 data (due to participant drop-out) were substituted with the participants' baseline value. Baseline differences between the intervention and control group were examined using independent t-tests. Steps/day and health related outcome	A significant interaction was identified between group (intervention, control) and time (baseline, week 12) in terms of the recorded step-counts, ($F_{(1,77)}$ = 25.18, $p < .001$, partial $\eta 2$ 0.25). A paired t-test found a significant increase in steps/day for the intervention group between baseline (M = 6802, SD = 3212) and week 12 (M = 9977, SD = 4669, t (38) = -6.06, $p < .001$, d = 0.79, confidence intervals 2,115 – 4236). No significant difference was observed in the control group between baseline (M = 6924, SD = 3201) and week 12 (M = 7078, SD 2911, t (39) = -0.50, p = 0.618, CI -463 – 770). The mean difference in change between the two groups was 3,022 steps/day and was statistically significant (t (77) = 5.02, $p < .001$, d = 1.96). Chi-square analysis determined that a significantly greater percentage ($\chi 2$ = 24.88, $p < .001$) of participants in the intervention group (25/39, 64%) achieved an increase of 15,000 steps per week, equivalent to physical activity guidelines of the accumulation of 150 minutes of moderate physical activity, compared with the control group (4/40, 10%). Wilcoxon's signed-rank tests revealed that at week 12 the intervention group recalled a significant increase in the number of leisure minutes walked (Z = 2.32, p = 0.02, r = 0.37, median [Mdn] difference = 100 minutes per week) and a significant decrease in	Recruitment was targeted specifically at individuals in the lowest socio-economic groups. Recruitment was targeted at data zones within 1.5 km of the university campus that were ranked within the top 15% of the Scottish Index of Multiple Deprivation (SIMD) (i.e. the most deprived zones). The results were presented on an intention to treat basis where all participants were considered. From 169 initial enquiries to the study, 91 individuals met the inclusion criteria and provided informed consent at an initial meeting.

		39) consisted of 31 females and 8 males and the control group (n = 40) consisted of 32 females and eight males. Overall, 55 of 79 participants (70%) were below the randomisation stratification variable of 8,000 steps at baseline: this consisted of 28 of 39 (72%) of participants in the intervention group and 27 of 40 (68%) of participants in the control		The first six weeks consisted of graduated bi-monthly goals with an aim for the increased walking behaviour to be maintained for the remaining six weeks. The overall goal of the walking program was for participants to increase their mean daily step-count by 3,000 accumulated steps above their baseline value on five days of the week. **Comparator** Participants assigned to the control group were asked to maintain their normal walking levels between baseline and week 12. At the end of week 11 these participants collected an individually calibrated pedometer from the research centre and wore this sealed during week 12 to gain a record of their step-counts. **Duration/length of follow up** There were six time points in the study (baseline, 12, 24, 36, 48 and 60 week). There were 15 participants who withdrew from the study between baseline and week 12.	data were analysed using two-way mixed factorial analyses of variance (ANOVA). Missing weekday step-count data were replaced by inputting the mean of the remaining weekdays and missing weekend step-count data were replaced by inputting the alternate weekend day. Exploratory analysis revealed that data from several sub-sections of the IPAQ were non-normally distributed. Non-parametric analyses were therefore used to analyze these data. Mann	weekday sitting (Z = 2.94, p = 0.003, r = 0.47, Mdn difference = 1200 minutes per week), weekend sitting (Z = 3.41, p = 0.001, r = 0.55, Mdn difference 360 minutes per week) and total sitting (Z = 3.38, p = 0.001, r = 0.54, Mdn difference = 1680 minutes per week) from baseline. At week 12 the control group recalled a significantly greater number of vigorous leisure minutes of physical activity (Z = 2.02, p = 0.043, r = 0.32, Mdn difference = 0 minutes) than at baseline. This result was due to five individuals in the control group increasing their vigorous leisure minutes recalled. As the majority of participants (34 of 40) report zero minutes at both time points the median difference equals zero despite the group reporting a significant increase. Mann Whitney U tests revealed that at week 12 the intervention group recalled a significantly greater number of leisure minutes walked (U = 513.00, p = 0.008, r = 0.30, Mdn difference 83.8 minutes), number of occupational minutes walked (U = 602.00, p = 0.045, r = 0.23, Mdn difference 0 minutes) and total number of minutes walked (U = 560.50, p = 0.03, r = 0.24, Mdn difference = 57.5 minutes) than the control group. The intervention group also recalled significantly less total time spent sitting (U = 546.00, p = 0.022, r = 0.26, Mdn difference = -420 minutes) due to significantly less time spent sitting at the weekend (U = 474.50, p = 0.003, r = 0.34, Mdn difference = -240 minutes). Health related outcomes- A significant interaction was identified between group (intervention, control) and time (baseline, week 12) in terms of the positive	

		group.			Whitney U tests were used to examine between group differences and Wilcoxon's signed-rank tests were used to examine within group differences over time. Due to the number of variables available from the IPAQ. Statistical significance was defined as $p < 0.05$ for all tests with data presented as mean (SD).	affect scores, ($F(1,77) = 4.26$, $p = .042$, partial $\eta 2$ 0.05). A paired t-test found a significant increase in positive affect for the intervention group between baseline (M = 31.2, SD = 6.7) and week 12 (M = 33.5, SD = 7.4, $t(38) = 2.29$, $p = .027$, $d = 0.33$, CI .27 – 4.39). No significant difference was observed in the control group between baseline (M = 31.7, SD = 6.9) and week 12 (M = 31.3, SD 7.6, $t(39) = -0.524$, $p = 0.604$, -2.31 – 1.36). There was no significant interaction or main effect found for the negative affect scores or for any of the other health related outcomes measured in the study	
Baker 2011 UK Walking	RCT [++]	N=61 44 women, 17 men, mean age 42.1 ± 10.6 years	Walking steps/minutes	**Intervention details** Individualized 4-week goal-setting programme based on: steps using a pedometer (PI, n = 21); overall goal to accumulate 3,000 additional steps above baseline levels, minutes (MI, n = 21); overall goal to accumulate 30 additional minutes above baseline levels or acted as a control (C, n = 19); maintain baseline levels for four weeks. The effect of providing supportive email prompts, based on components of the Transtheoretical Model of	Scottish Physical Activity Questionnaire	PI increased walking from baseline to week four (3,006 steps/day, $p < .001$) but decreased between week four and 12 months (1,799 steps/day, $p = .044$). Neither MI nor C altered steps over time. There was no difference in steps between ES and NS at 12 months.	

				Exercise Behaviour Change, on maintaining walking at a 12 month follow-up was also investigated. Participants either received email support (ES, n = 28); based on the processes of consciousness raising and self re-evaluation or no support (NS, n = 33) between 8 and 12 months. **Comparator** Control group asked not to increase walking and instead maintain normal walking levels. Given sealed pedometer to measure walking at beginning of week 4. **Duration/length of follow up** 4 weeks, 12 month FU			
Behrens 2007 USA Walking	ITS [+]	city employees formed groups of 10 (N=640, 64 teams). Blue and white collar workers. Missing data; N=52 (81%) teams completion rate Steps recorded weekly by team leader	Step count	**Intervention details** Competition based employer sponsored physical activity programme using pedometers. Designed by city planning committee. 12 week goal of each participant attaining 10,000 steps per day. Updates on progress of all teams given weekly. Steps reported for each team of 10 people **Comparator** No direct comparator **Duration/length of follow up** 12 weeks.	Mean, standard deviation and 95% CI of step counts calculated.	Significant difference in team steps by week of programme, with post hoc comparisons indicating significant differences from baseline step counts during weeks 6-8 ($F=71.15$, $p<0.001$) but not at the end of the programme. However, the overall programme did not result in significant increases in steps (week 1 to week 12). Variation in number of steps in weeks 11 and 12 was high due to drop outs.	Authors suggest that from week 8, participants who felt they couldn't win became bored with the unchanging routine of the programme or simply dropped out.

		once a week.					
Bickerstaff 2000 UK Walking	BA [+]	309 pupils 1 primary/nursery school	Percent walking	**Intervention details** Three walking buses and additional interventions such as walk to school days and park away days, street lighting along walking bus routes. **Comparator** None **Duration/length of follow up** 14 months	Classroom surveys. Methods unclear.	Walking increased from 60% to 68.3% in 14 months (no further statistics). 25% of all walking was with walking buses.	Taken from NICE physical activity in children report Same intervention as Cairns 2006c?
Borg 2010 Australia Walking	nRCT [+]	332 inactive staff (<3 sessions a week of walking or MVPA in previous week). Aged 18 and above: 23-39: 26% 40-59: 37% 50+: 37% Female: 88% BMI Normal: 33% Overweight: 34% Obese: 33% N=206 at 12 months (62%).	Self reported minutes walking. Minutes of moderate-vigorous physical activity (MVPA) Total physical activity in past week. Proportion meeting public health recommendations by walking and total PA. Health related behaviours.	**Intervention details** Step by Step self help walking programme plus pedometer. Staff define as inactive received three month walking programme and pedometer plus four maintenance newsletters over nine months to assist them to maintain their new PA levels at 4,5,9 and 11 months (standard + maintenance). All participants received a diary cards for recording weekly activity (including baseline). **Comparator** Three month walking programme and pedometer (standard) **Duration/length of follow up** Follow up at 12 months.	Previously motivated a community sample of adults to be active for up to three months. This study evaluates the effect of an enhance programme in the work place for an additional 9 months. 20min phone interview at baseline and 12 month follow up. Active Australia questionnaire.	Baseline = 68 min of walking (Z=1.05, p=0.29) and 56 min MVPA (Z=0.04, p=0.96). ITT analysis: Both groups significantly increased minutes walking (p=0.01). No between group differences in walking minutes (Wilcoxon = 0.23, p=0.82). Change in MVPA minutes was significantly higher in the standard + maintenance group compared with the standard group (118min vs. 69min p=0.029). No significant difference between groups for total observed PA (161 min vs. 117 min p=0.187). Wearing the pedometer at 12 month follow up and considering the pedometer to be very useful increased the likelihood of meeting public health recommendations (AOR=2.7 (95%CI 1.2-6.3) and 2.5 (95%CI 1.5-5.6) adjusting for other co-variances. The standard programme resulted in long term increases in PA but the maintenance strategy had no significant benefit (ITT and completer analysis).	No significant differences between completers and drop outs except, higher proportion of women dropped out (p=0.02). Authors report potential contamination, with control group participants asking to receive the newsletter. Loss of 127 participants reduced statistical power. Reliance on self reported measures.
Bowles 2006	BA [+]	Men and women age 16	Cycling	**Intervention details** Participants in a mass cycling	Self reported online	13% reported themselves as low ability in the pre event survey.	

Australia Cycling		years and older n=918 Male = 72% 83% competent or regular cyclists.		intervention reported cycling ability and number of times cycled one month before and after the event. Event was part of an annual scenic ride across Sydney organised by cycling NGOs. Participants have the option of cycling 20 or 50km. **Comparator** None **Duration/length of follow up** 2 months (1 month before and 1 month after event).	questionnaire	Half of the survey respondents (51.1%) who reported their cycling ability as low before the event subsequently rated themselves as high after the event. Respondents with low pre-event self reported cycling ability reported an average of 4 sessions of cycling in the month before the event and an average of 6.8 session in the month after the event (t=5.25, p<0.001).	
Brockman 2011 UK Walking/Cycling	ITS [+] Bi-annual travel survey 1998-2007	N=2829 in 2007 Previous years; 1998 n=2202, 2001 n=2332, 2003 n=1950, 2005 n=2647. Not possible to match responses between years. In 2007: Male 43.3% Age <25 5.1% 26-45 59.8% 46-66 21.2% >56 13.9%	Mode of transport to work (self reported). (Also work site location and distance commuted).	**Intervention** University transport plan. Included: limited parking spaces and permits, improved changing facilities for walkers/cyclers, secure cycle storage, subsidised cycle purchase scheme, car share scheme, free bus from train and bus stations, discounted season tickets for public transport. Published in 1999, changes implemented in 2000. **Comparator** No direct control group. **Duration/length of follow up** 1998-2007.	Self administered postal questionnaire. Trends analysis. Results given as % only.	Between 1998 and 2007, in contrast to national trends: The percentage of respondents who reported they usually (4-5 times a week) walked to work increased from 19 to 30% (Z=4.24, p<0.001). The percentage of regular cyclists increased from 7.0% to 11.8% (n.s). In 2007 regular walkers were more likely to be female, under 35, middle income; regular cyclists were more likely to be male, 36-45, high income. The percentage of respondents who usually commuted by car decreased from 50% to 33% (p<0.001).	Transport plans aimed at reducing car usage can be a feasible and effective strategy for increasing walking and cycling. Improving health/increasing physical activity were not objectives of the travel plan. QUAL: Walking to work is a viable strategy for increasing activity in women, may be additional barriers to cycling for women. Cannot determine change for individuals. Survey response rates were less than 50% (although responder

							profile was similar to total workforce). Cannot determine the effect of individual strategies within the plan.
Brownson 2004 USA Walking	nRCT [++]	Adults aged >18. Community populations ranged from 2399 – 17,642. n = 1233 Female 76.6 intervention, 74.0 control. Age: 18–29 14.4%/18.3% 30–44 28.0%/27.1% 45–64 33.7%/32.6% +65 23.4%/21.7%	Rates of walking trail use. Total number of minutes walked/week. Total minutes walked for exercise.	**Intervention details** Changes in walking behaviour in 6 rural communities in Missouri. Interventions were developed with community input and included individually tailored newsletters, interpersonal activities that stressed social support, and community wide events such as walk-a-thons. Academic team worked with local governments to develop walking trails in the communities. Trail lengths varied from 0.13 to 2.38 miles. Two trail heads had electronic counting devices installed. Some community members received electronic cards which tracked their trail use using a swipe card reader. Focus groups provided information on perceived benefits of walking and trail use, social factors and other facilitating and inhibiting factors. Information was used to develop tailored newsletters. Printed feedback materials were created for individuals who filled out a brief, one-page questionnaire that assessed their status on theoretical constructs like self-efficacy, social support, perceived benefits and barriers, motivation health-related behaviours, resource availability,	Using random-digit dialing,33 cross-sectional samples were selected of non-institutionalized adults in the six intervention communities in Missouri and six comparison communities.	Amongst trail users (at baseline 16% of population), 32.1% reported increases in physical activity since beginning to use the trail. For the entire population, rates of 7 day walking for any purpose or for exercise declined slightly in the intervention communities compared with the comparison sites: Total walking intervention effect -1.4min (p=0.91). Walking for exercise intervention effect -5.6 (p=0.37) From the community wide samples two subgroups (education high school degree or less, and people living with annual household income <$20.000) indicated a positive net change in rates of 7 day total walking, but results were not significant.	Author recommendations: Allow sufficient time for intervention development. Understand the benefits and challenges of new technologies. Understand needs and build skills among academic and community partners. Measure impact of social and physical environments.

				and preferences for walking alone or with others. Provided positive reinforcement to those who walked regularly and motivational information and supportive resources for those who did not walk regularly. Participants received by mail eight different one-page feedback letters that consisted of a masthead and walking-trail graphic tailored to the participant's community, an announcement of upcoming community events, and two messages tailored to their responses to items on the one-page questionnaire. Walking clubs were formed to build social support for physical activity. The clubs were free of charge, and they often provided participation incentives (e.g., water bottles, t-shirts), and were organized around activities such as walk-a-thons. **Comparator details** 6 comparator communities. No intervention. **Duration and length of follow up** Timeframe unclear.			
Brownson 2005 USA Walking	nRCT [+]	Six communities in the Missouri region of the USA were the intervention and six communities from	Two special risk factor surveys were conducted. The survey was administrated by trained interviewers from July through to September 2003 (n=2470) and	**Intervention** Interventions were developed with community input and included individually tailored newsletters; interpersonal activities that stressed social support and health provider counselling; walking clubs and community-wide events such as fun	Analyses were completed after stratifying the data by gender and for those individuals who reported having high versus low access to physical activity facilities.	Mean rates of walking/week at baseline were 97 minutes in the intervention areas and 103 minutes in the comparison areas. The amount of change in the walking/week at follow-up was higher in intervention (11.7 minutes) than in comparison participants (6.5 minutes), although not statistically significant. At baseline, the same percentage of respondents from intervention and comparison areas met the recommendations for walking (18.8% and 19.1%	The study relied on self-reported telephone survey data.

		Arkansas and Tennessee were the comparison. n = 1531	from July through to September 2004 (n=1531). The primary endpoint for the study was the rate of meeting recommendation for walking.	walks. **Comparator** N/A **Follow-up** The survey was administrated by trained interviewers from July through to September 2003 (n=2470) and from July through to September 2004 (n=1531).		respectively, p= 0.864). At follow-up, the percentage of respondents who met the recommendation for walking was again the same across the intervention and comparison areas (22.2% and 21.6% respectively, p= 0.811).	
Bull 2008 UK Walking/ Cycling	BA [+]	One pedometer project reported. N=2240 hospital employees. 28% male Mean age 41 35% White.	Step count Walking Cycling Active travel (Programme: Physical activity Smoking Nutrition)	**Intervention details** 11 Well@Work programmes were established across 9 English regions (total of 45 initiatives). Physical activity accounted for 40% of initiatives. Diverse set of initiatives and actions aimed at promoting and supporting healthy lifestyles. Reported intervention included 3 team based pedometer competitions to increase total number of steps/week accumulated. **Comparator details** None **Duration and length of follow up** 3 years, average project length 22 months. Pedometer competition = 4 weeks.	Employee questionnaire conducted before/after project (20-22 months). Workplace site assessment (environmental).	10,15and 9 teams started in the three competition, but 4, 8 and 4 teams completed (respectively). Average increases in step counts ranged from 77,130-126,519. The average change in step counts from baseline in the completing teams were: 1. (4 teams) 39% (range 3-555) 2. (8 teams) 32% (7-77%) 3. (4 teams) 48% (16-63%). No long term (post competition) data available. Over the whole project: A significant increase (9%) in the proportion of employees participating in active travel (walking or cycling). Significant increase in employees cycling (4%) or walking (8%) to work. Non significant increase in meeting physical activity recommendations (4%). Workplace supporting environment: Cycling and walking environments surrounding the workplace scored low (33% and 18%). Changes to the supportive environment were mainly aimed at supporting physical activity (e.g. the provision of new bicycle storage facilities and pool bicycles) and healthy eating (e.g. provision of healthy eating centres).	Survey response rate 33% pre and 21% post intervention. Four new tools developed to capture information: log of activities, workplace champion survey, event summary form and participant satisfaction form.

Cairns 2006a UK Walking/ cycling	BA [+]	N=179 pupils Age 4-7. One primary school	Walking to school Travel to school	**Intervention details** School travel plan group developed a walking bus. Walking incentive scheme "going for gold". Card is stamped every morning if child walks to school. Children arriving by bike or scooter also receive initiatives. Also: cycle training, pedestrian training, park and walk, parent talks, curriculum work, school assemblies, newsletters. **Comparator** None **Duration/length of follow up** 41 months	Unclear	April 2000 travel to school: 62% car, 30% walk, 8% park and walk, 0 cycle. October 2003 travel to school: 25% car, 58.8% walk, 12.5% park and walk, 4% cycle Only percentages reported.	Not clear how study data was collected. Taken from NICE physical activity in children report.
Cairns 2006b UK Walking	BA [+]	N=585 primary school pupils. Age 4-11.	Walking rates Travel to school	**Intervention details** Walk on Tuesday and Thursdays (WOTT) and Commitment to Walk incentive included certificates, stickers and trophy incentives. Commitment to walk focused on continuing to walk in inclement weather. On WOTT days record cards signed by parents to confirm walking. **Comparator** None **Duration/length of follow up** 48 months	Unclear	March 1999 travel to school: Car 36.5%, walk 53.3%, park and walk 9%, bus 1.4%. March 2003 travel to school: Car 26.6%, walk 58.7%, park and walk 14%. Only percentages reported.	Not clear how study data was collected. Taken from NICE physical activity in children report.
Cairns 2006c UK Walking	BA [+]	N=309 primary school pupils. 1 school.	Walking rates Travel to school	**Intervention details:** Walking buses (n=3), also walk to school days and park ways days, street lighting along walking bus routes. **Comparator**	Classroom surveys. Methods unclear.	Walking increased from 60% to 68.3% in 14 months (no further statistics). 25% of all walking was with walking buses.	Taken from NICE physical activity in children report. Same intervention as Bickerstaff 2000?

				None **Duration/length of follow up** 14 months			
Chan 2004 Canada Walking	ITS [+]	Participants (n = 106) from five workplaces - federal or provincial government-funded departments or agencies. A majority of the job types were sedentary in nature, such as clerical, administrative, or data processing age 43 ± 9 years (±SD) BMI was 29.5 ± 6.2 kg/m^2. At baseline, the steps per day for women (n = 92) were 6,981 ± 3,140 and for men (n = 14) were 7,661 ± 2,474	Ambulatory activity (pedometer-determined steps per day) Body weight (in light clothing and without shoes), height, and waist girth (taken at the level of the last rib, standing). Heart rate and blood pressure	**Intervention** PEI-FSP was divided into two phases, an ‘‘adoption’’ phase of 4 weeks and an ‘‘adherence’’ phase of 8 weeks. During the adoption phase, participants met in workplace-based groups with a facilitator for 30–60 minutes each week during a lunch break. All received 6 hours of training on group facilitation and PEI-FSP curriculum. Each week of the adoption phase, participants set individual steps per day goals and self-monitored their progress using a pedometer to record daily accumulated steps taken. **Comparator** N/A **Length/Follow-up** 12 weeks	Scheduled assessments were arranged at each workplace for the collection of anthropometric and health indicator data before the adoption phase (baseline) and following the adherence phase (post program) of PEI-FSP.	At baseline, the steps per day for women (n=92) were 6,981 ± 3,140 and for men (n=14) were 7,661 ± 2,474 (p>0.05). There was a negative correlation between the increase in steps per day and baseline steps per day (r = -0.368, P <0.0001). A small number of participants (n = 7) recorded decreases in activity relative to their baseline steps per day, ranging from -2.4% to -20.6% (12.0% ± 7.6%). The baseline steps per day of the individuals becoming less active were 11,389 ± 4,570 and the initial BMI was 29.5 ± 7.2 kg/m^2. To determine if baseline BMI affected the ability of participants to increase their physical activity, the change in steps per day was correlated with baseline BMI. No significant correlation was found (P = 0.4850). Heart rate decreased significantly (P <0.05) but there were no significant changes in systolic or diastolic blood pressure. The waist girth decreased with increasing change in steps per day (p =0.0073) or with a larger initial waist girth (P = 0.002) but was not related to the baseline steps per day (p > 0.05).	. Program completers (n =106, 59.8%) recorded eight or more weeks of pedometer data and also attended the final scheduled assessment. Partial completers (n = 26, 14.7%) recorded 8 weeks or more of pedometer data or attended the final scheduled assessment, but not both. Program dropouts (n = 45, 25.4%) did not provide 8 weeks of pedometer data nor did they attend the final scheduled assessment.

		(P > 0.05).					
Cirignano 2010 USA Walking	ITS [+] Convenience sample	Students in grades 4 (n=64), 5 (n=68) and 6 (n=52). N=184, but 169 in final analysis. White 74% Female 51.6%	Weekly and daily steps recorded on pedometers.	**Intervention** 6 week in school walking programme. Pedometers and "Fit Bits" programme to implement physical activity breaks in the classroom throughout the school day with 10-15 minute activities. **Comparator** No direct comparator **Duration/length of follow up** 6 weeks Parental follow up at 6 months	Student step logs recorded daily steps. Teacher Step log recorded weekly step totals for each student. Parent evaluations by post before / after intervention. Teacher exit interviews.	Mean steps increased significantly from 19,149 (95% CI 18,224 – 20,073) in week 1 to 21,248 (95% CI 19,730-22,765) at week 6 (p<0.001). The largest increase in steps was found among fourth graders. Six months after the intervention 40% of parents reported that their child continued to use a pedometer. 90% felt the programme was beneficial in promoting physical activity in their child.	Not randomised, no control group. Could not determine if increased steps due to pedometer or "Fit Bits" intervention.
Clarke 2007 USA Walking	BA [+]	Low income, overweight and obese mothers (n=124) Age 18 to 45 years; African-American, white, or Hispanic ethnicity; youngest child aged 1 to 4 years; ability to speak and read English; BMI ≥25, low-income Comparison group (n=38). These women	Self-reported height and weight Waist circumference Steps, energy expended, and the elapsed times that the pedometer was worn were documented directly from the pedometer onto the worksheets.	**Intervention** An 8-week physical activity and dietary program. The eight weekly lessons included recommendations for physical activity, healthful eating, and behaviour modification. The physical activity component of the intervention consisted of class discussions and 30 minutes of exercise at each class. The participants shared ideas for establishing exercise goals, reducing barriers, and identifying sources of social support. The instructor led physical activities that mothers could continue on a daily basis, such as walking, resistance training, and video exercise tapes. Mothers were instructed to exercise at least 5 days a week for 45 minutes/session at a moderate intensity, equivalent to a brisk walk. Physical activity for the mothers was assessed by weekly recording of steps and energy expended via pedometers. Exercise intensity was not evaluated.	The participants completed demographic, motivational readiness for exercise, and exercise self-efficacy questionnaires and recorded pedometer steps for 3 days at weeks 0 and 8. Trained personnel collected anthropometric data at baseline and post-intervention . Intervention participants completed a 23-item program	Higher self-efficacy at week 8 was reported by mothers in the action/maintenance stage than the contemplation and preparation stages (3.0 vs. 2.6, P<0.05). Improvements in exercise self-efficacy scores were correlated with reductions in body weight (r= -0.22, P<0.05) and percent body fat (r= -0.27, P<0.01). Pedometer steps increased significantly by the end of the program. Only 4.3% (n=4) of subjects averaged fewer than 4,000 steps/day (low), whereas 49.5% (n=46) recorded between 4,000 and 10,000 steps/day (moderate) and 46.2% (n=43) met the 10,000 steps/day criteria for high activity (the intervention group increased their steps from a mean of 5969 ±3123 to a mean of 9757 ±3843). This corresponds to initial levels of 30.1% (n=28; low), 58.1% (n=54; moderate), and 11.8% (n=11; high). Energy expenditure, as calculated by the pedometer, increased by 224 kcal/day (P<0.001). Mean pedometer steps at week 8 were associated positively with submission of self-monitoring pedometer worksheets (r=0.38, P<0.01). Overall, there were significant correlations between exercise self-efficacy and pedometer steps (r=0.30, P<0.01), energy expended (r=0.28, P<0.05), and exercise readiness (r=0.28, p=0.01) at week 8. Intervention participants significantly decreased their body	Of the 124 participants, seven did not complete pedometer records and 24 reported a disproportionate number (≥3) of "not applicable" responses for the exercise self-efficacy questionnaire. The number of exclusions for this questionnaire was within the expected range. An example of a question that yielded a non-applicable response included the following: "I am confident I can participate in regular exercise when I feel depressed." This left a final sample of 93 women in the intervention group. Of

		met the same qualifications as the intervention subjects; however, they were of a healthful weight (BMI <25).		The diet component of the curriculum consisted of menu planning with ethnic foods, cooking demonstrations, and information on recipe modifications, portion control, food budgeting, and the energy content of fast foods. Behaviour topics that were presented included social support, self-monitoring, role modelling by successful dieters, and stress management. **Comparator** Usual lifestyle **Follow-up** **8 weeks**	evaluation. The form included items on a five-point scale (one=strongly disagree to five=strongly agree) and (one=not useful to five=very useful), as well as open ended questions.	weight (mean= -6.6 lb; range= -29.6 to 7.4 lb), percent body fat (mean= -1.4%; range= -7.3% to 5.6%), and waist circumference (mean= -1.4 in; range= -8.3 to 6.3 in) during the program. Similar increases in pedometer steps were found across the range of weight-loss outcomes (P>0.05). Also, there was further weight loss (mean= -0.3 lb; range= -15.4 to 16.6 lb) at week 24 for the intervention group that totalled -6.9 lb (range= -41 to 10.2 lb) for the entire study period.	these 93 women, 84% of participants (n=78) completed the follow-up visit at week 24.
CLES 2011 UK Walking	nRCT [++]	(48%) of all those engaged reported being inactive when they first got involved; 25% were insufficiently active. 57%) the control groups were more active, with 39% of people being classified as 'active' and 21% 'insufficiently active'. 47% of all	Walking Physical activity	**Intervention details** Get Walking Keep Walking (GWKW) is the Rambler's flagship everyday walking programme. It is a four year project developed by the Ramblers to increase regular independent walking amongst previously inactive and insufficiently active people. GWKW comprises six projects – five local projects in Birmingham, East London, South London, Manchester, and Sheffield, and one project specifically to provide 'Get Walking packs' to inactive people across the rest of England. It is funded by the Big Lottery Fund and the Ramblers Holiday Charitable Trust with additional in kind funding. **12 week programme**: Each adult programme involves five sessions that incorporate bespoke, led walks developed specifically for the session. The sessions occur on Weeks 1, 2, 3, 4	Baseline and follow up survey.	By the end of 2010, GWKW staff and volunteers had delivered 1,740 led walks over the course of the programme. Two thirds (67%) of beneficiaries increased the amount of exercise they did each week, one in five (18%) saw no change, and a slightly smaller proportion (16%) reported a decrease. A large majority (83%) of the most inactive group increased the number of days a week on which they undertook a minimum of 30 minutes exercise; only around one in eight (12%) saw no change; and a very small minority (4%) a decrease. For those categorised as 'insufficiently active' at registration (people undertaking a minimum of 30 minutes exercise for 3-4 days a week) over half (56%) increased their rate of exercise, and around a fifth (22%) stayed the same. For beneficiaries who (at registration) were already meeting the government's recommendation on exercise (5 x 30 minutes), around one fifth (22%) increased this still further by participating in GWKW.	GWKW has successfully engaged large numbers of people (over 75,000), and is on course to meet or exceed its targets before the end of the programme in December 2011. GWKW has also worked hard to engage schools, and local programme teams have delivered 54 schools programmes. In each of the five project areas, progress against targets for people attending led walks is on track, with one area having met their targets more than nine months early. Spending to date is in line with delivery and

		beneficiaries, excluding the online packs, live in the top 20% most deprived areas in the country. 48% of programme beneficiaries were from BME backgrounds 77% of programme beneficiaries and 74% of pack beneficiaries were female 7,883 completed registration and follow-up questionnaires (7,240 for those beneficiaries who received Get Walking packs, and 587 for those who participated in GWKW Programmes		and 12. Between Weeks 4 and 12 participants are encouraged to undertake independent walking and are given an independent walking pack, identical to the Get Walking pack. At Week 12, there is a closing session to celebrate participants' walking progress. At Week 4 or 12, there is also signposting to other walking opportunities to encourage people to carry on walking. In addition, there is at least one interim contact during the seven weeks of independent walking, either from GWKW staff or volunteers. By the end of March 2011, 7,953 people had been involved in GWKW through the local programmes. **Taster events** are also organised and run by local GWKW staff. These occur either when it is impractical to run a full programme, or to cater for people who would like to find out more before committing to the 12-week programme. The taster events involve a one-off led walk and are often tied into a specific event, such as a local fun day. In Birmingham, walks were run as part of the City's Arts Fest, and in Sheffield the GWKW team organise the Sheffield Walking Festival. Schools: GWKW delivers five and six week programmes for schools, which involve 5-6 weeks of continuous sessions designed to fit into the school timetable and link to the curriculum. The programmes also involve bespoke, led walks and sessions aimed at encouraging children and young people		In general, there was an increase in walking amongst beneficiaries between registration and follow up. In terms of walking from place to place, there was an increase of 1.1 days per week; and in terms of walking for leisure, the increase was 1 day per week. Programme beneficiaries saw a small change in the amount they walked from place to place each week (from 4.9 to 5.1 days a week); however other beneficiaries experienced a greater change. After being involved in GWKW all beneficiaries walked more than the control group. GWKW has had a substantial impact on those who walked the least. Those classified as 'inactive' at registration increased the days on which they walked from place to place by 1.6, and the days they walked for leisure by 1.4 per week. In both cases, the least active at registration are now walking more than the control group. Whilst there was an increase in the number of days on which beneficiaries walked from place to place of 1.1 days per week, it was greater for those living in the top 20% most deprived areas of England, at 1.4 days per week.	there is no significant under or overspend. Overall, the programme is progressing well and milestones to date have been met. **Additional reports on individual areas also provided.**

		and tasters).		to walk. At the end of 2010, the GWKW team had delivered 54 of these. Also walking routes developed and publicised, walking packs distributed, online resources available. **Comparator details** A control group survey was implemented to assist us in exploring changing activity levels and walking in the wider population, and therefore to assess the extent to which increases in physical activity and walking amongst beneficiaries can be attributed to participation in GWKW. **Duration and length of follow up** 12 weeks			
Coleman 1999 USA Walking	RCT [++]	University at Buffalo employees . non-smoking women ages of 18 and 55; non-smoking men ages of 18 and 45 no history of diabetes or current diabetic condition, not more than 80% over ideal weight for their height,	Self reported walking	**Intervention** Three groups of brisk walking/6 days per week: 30 continuous minutes, three 10-minute bouts, and 30 minutes in any combination of bouts as long as each bout was at least 5 minutes. **Comparator** **N/A** **Follow-up** Objective activity patterns were assessed at baseline, at the end of the 16-week program, and at the 32-week follow-up using the TriTrac accelerometer.	Diary self-report was assessed at base line, at the end of the 16-week program, and at the 32 week follow-up	Self-reported walking for all groups significantly increased throughout the program ($F(6, 186) = 26.16$; $p < 0.001$), with increases above 3&4 beginning in weeks 11&12 (average walking of 173 ± 46 minutes/week) continuing through weeks 13 & 14 (average walking of 170 ± 58 minutes/week) and weeks 15 & 16 (average walking of 158 ± 66 minutes/week) when compared to weeks 11 & 12. There were no group differences in self-reported walking of the program, nor was there a significant interaction of group with weeks of walking.	11.0% (4 in 36) attrition rate. The remaining 32 participants completed the program and all measures at follow-up. There were 11 participants in the choice and 3 X 10 minute groups and 10 in the 1 X 30 minute group.

		sedentary (not engaging in vigorous intensity exercise at least three times per week for at least 20 minutes per session or not engaging in moderate intensity exercise for 30 minutes at least five times per week for the past 2 years), n=32					
Cope 2009 UK Cycling	ITS [+]	Six towns: Aylesbury Brighton and Hove Darlington Derby Exeter Lancaster with Morecambe. No population details.	Overall changes in cycling activity.	**Intervention details** Cycling demonstration towns: invest in measures to stimulate levels of cycling through combinations of physical infrastructure, promotion and other smart measures over a three-year period. **Comparator details** None **Duration and length of follow up** 3 year project, 4 years follow up.	Cycle activity measurement and monitoring. Network of automatic cycle counters in each of the towns plus manual counts. Counts of parked bikes School travel surveys	Automatic counter data indicated an average change in cycles counted of +27% across all towns between January 2006 and December 2009. The average change in cycle counts ranged from +2.4% to +56.8%. Cyclists increased in 3 towns, decreased in two and the result was mixed in the final town. Counts of parked bikes increased in two towns ranging from +8% to +32%and decreased in a third -9% (others not measured). The proportion of children cycling as the usual mode of travel to school increase in 5 of 6 towns. Pre and post survey data are available for a total of 60 schools engaged in Bike It. The proportion of children 'never' cycling to school calculated from pooled pre-survey data (collected in either September 2006 or September 2007) was 79%, compared to 56% of children in the pooled post-	

						survey data (collected in either July 2007 or July 2008). The proportion of pupils cycling to school at least once a week increased from 12% in the pre-survey to 26% in the post-survey (based on pooled data).	
Cope 2011 UK Cycling	ER (-)	Whole populations of six towns: Brighton, Darlington, Derby (young people only), Exeter, Aylesbury and "Lancaster and Morecambe	Cycling.	**Intervention details** Interventions to increase cycling in 6 Passenger Transport Executive regions. Including: Increasing cycle access to public transport (secure parking, bike lockers, bikes on buses) Infrastructure (cycle training in all areas, signage, marketing and information, mass participation events). **Comparator details** No comparators **Duration and length of follow up** 2001-2011	Evaluation report, very little data given.	In South Yorkshire, secure parking for 300 bicycles at transport hubs translated to 21,700 intermodal journeys on cycles and public transport. 29% increase in cycles parked at Sheffield station and 44% at all stations. Bikes on buses scheme in rural areas – limited evidence of success. Sheffield Bike Boost – 73% of recipients of cycle training intended to become regular cyclists. Signage and infrastructure. Data from automatic cycle counts indicated 12% increase over all routes and up to 60% at specific sites. In Manchester, cycle and workplace challenge events resulted in 44 new cyclists and increased frequency of cycling amongst established cyclers. Overall results indicated a 66% increase in cycling since 2001 with cycling more than doubling in Sustrans Bike It schools.	Evaluation report data anecdotal. Reference to specific schemes – broken links and no further data in documents found.
Culos-Reed 2008 Canada Walking	BA [+]	N=52 (39 at post test) Mean age 66.4 (46-83) White 96.2% Female 80.8% Retired 76.5% Overall attendance rate 62.4%. Drop out (excluding non-starters) 19.2%	Fitness measures, physical activity behaviour, quality of life. Step count. Walk time.	**Intervention details** 8 week mall walking programme. Participants self selected pace, time, and frequency. Encouraged to attend as often as possible between 8am and 10am Monday to Friday. Provided with pedometers and checked in with research assistant prior to walking. Encouraged to increase speed and distance over the 8 weeks. **Comparator details** No direct control.		Significant improvement in physical activity behaviour and most fitness indices, but not quality of life. Significant effects for Leisure time questionnaire score increase from 20.6 (SD 10.8) to 28.1 (SD 11.9) ($p<0.005$) Average daily mall walk steps increased from 5055 (SD 1374) to 5969 (SD 1543) ($p<0.002$) Average daily mall walk time increased from 42.9 (SD 10.6) min to 50.4 (SD 13.5) min ($p<0.002$) BMI decreased from 29.1 (SD 4.6) to 28.5 (SD 4.4) ($p<0.001$) Walk test distance increased from 549.9 (78.5)m to 612 (88.1)m ($p<0.001$) Post walk test rate of perceived exertion increased from 5.6	Financial reward (discount card) provided on completion of the programme but not revealed to participants before. Small sample size, short recruitment period, brief intervention, potential selection bias (not discussed further), moderate dropout rate, accuracy of pedometers.

				Duration and length of follow up 8 weeks.		(2.0) to 6.7 (1.9) ($p<0.001$).	
Darker 2010 UK Walking	RCT [++] Waiting list randomised	n=130 Age 16-65, not walking more than 90 minutes/day. 92 female (70.8%) Mean age 40.60 (SD 10.84). 80% power calculation. No significant differences in mean scores at baseline. Drop out 24 (intervention) and 15 (control) over all.	Walking (self reported) Walking (pedometer)	**Intervention** Took place in a laboratory. Behavioural change intervention aimed to alter perceived behavioural control (PBC) concerning walking and to develop plans to "enact intentions to walk" (using theory of planned behaviour). Motivational component had 3 stages: shown 10 statements about what would make it easier for them to walk more, complete scale to show how confident they would be about walking in each situation, discussed with facilitator and walking plan developed (including goal setting, action planning and coping planning) **Comparator** Controls received the intervention at t2. **Duration/length of follow up** Follow up one week (t2), two weeks (t3) and one month (t4). No blinding.	Neighbourhood physical activity questionnaire Theory of planned behaviour questionnaire	The intervention increased objectively (pedometer) measured walking from 20 to 32 minutes per day. At 6 weeks, participants maintained their increases in walking. Significant difference in number of minutes spent walking (pedometers) in the week up to t2 between the control group (M=138.7, SD=93.3) and the intervention group (M=22.5 SD=100.3). The increase in walking was from a mean of 19.8min to 32.2min per day (increase of over 60%). Significant increase in number of minutes spent walking per week for intervention group t1-t4 (mean 287.3, SD=129.4) [$t(46)=8.12$, $p<0.001$). Significant also for t1-t2, t1-t3 (mean 305.0, $p<0.001$) but not t2-t3. Control group significant increase in minutes spent walking t2-t3 (mean 293.7, $p<0.001$) and t2-t4 (mean 259.0, $p<0.001$) but a decrease t2-t4.	Study focuses on success of TPB model to predict increases in walking, rather than the effectiveness of the intervention to do so. Difficult to attribute change to particular aspects of the intervention. Intervention resulted in a large increase in the number of minutes spent walking. Although the level was not maintained fully at t4 it was still significantly above baseline.
De Cocker 2009 Belgium	BA [+]	N= 438 intervention participants (207 male) with a mean age of 49.8	1-year follow-up: Have you used a pedometer in the last 10 months? (yes/no).	**Intervention** During the intervention, physical activity was promoted in the entire city of Ghent, using the central theme of '10,000 steps/ day', with secondary taglines of	Descriptive statistics (numbers and percentages) were calculated using cross tabs.	Only 72 (16.4%) intervention participants used a pedometer during the one-year intervention period. Participants older than 49 years ($p = 0.001$), those who reported having heard or seen a message about PA promotion ($p =$	All self reported measures, recall over one year. The authors said 440 participated in the one year follow-up., but reported

Walking		(SD 13.1) years. About 52.9% (n = 232). The majority (n = 344, 79.1%) reported good to excellent health.	Have you heard or seen any messages about PA promotion? (yes/no); Do you have any idea about the amount of physical activity that is required for health benefit? (yes/no + open ended); Have you heard of the "10,000 Steps Ghent" project? (yes/no);	'every step counts') and 'every revolution (of bicycle pedals) counts'). The guidelines, recommending 30 minutes of moderate-intensity physical activity on five days a week, or 20 minutes vigorous-intensity physical activity on three days a week were also promoted. Multiple strategies, based on the social ecological model, were designed to intervene at the individual, social and environmental level. A local media campaign (street signs, press conferences, advertisements), the sale and loan of pedometers, the use of a website, workplace projects, projects for older people and the dissemination of information through Health professionals, schools and associations were concurrently implemented. Participants were asked to record the date, steps taken at the end of each day, and the type and duration of non-ambulatory activities (i.e. biking and swimming). For every minute of reported biking and/or swimming, researchers added 150 steps to the daily total number of reported step counts **Comparator** N/A **Duration/length of follow up**	Binary logistic regression was used to examine whether individual characteristics and intervention exposure variables were associated with (1) pedometer use during the intervention and (2) greater than mean step count increase (> 896 steps/day). Results are expressed as odds ratios with 95% confidence intervals and p values. All data were analyzed using SPSS 15.0 for Windows and statistical significance was set at 0.05.	0.006), and those who knew about "10,000 Steps Ghent" (p = 0.047) were more likely to report pedometer use. None of the other potential explanatory variables was significantly associated with pedometer use during the intervention. Overall, 209 (47.5%) participants showed an increase in average step counts of 896 steps/day or more at one-year follow-up. Participants with a college or university degree (p = 0.046), and those who used a pedometer during the intervention (p = 0.014) were more likely to have increased their step counts by 896 steps/day or more, while those with a baseline average step count level of more than 10,000 steps/day were less likely to have increased their step counts by 896 steps/day or more (p <0.001). None of the remaining variables was significantly associated with the step count increase of 896 steps/day or more.	results for 438. and did not report on why the numbers were different. 2081 randomly selected 25–75 year old adults, living in the city of Ghent (Belgium), were invited to participate. Of those, 872 were interested, 648 completed baseline measurements and 440 participated in the one year follow-up.

				One year follow-up.			
Dinger 2005 USA Walking	BA [+]	Insufficiently active women. N=43 at baseline, (36 participated in intervention and post intervention data collection). 88.9% White 69.4% college degree. 33.3% overweight 44.4% obese Age 27-52 (41.7 +/-6.8)	Walking behaviour (time spent walking). Transtheoretical model of change Self efficacy	**Intervention** 6 week minimum contact intervention on walking behaviour. Women given brochures and pedometers and were sent emails that contained messages designed to positively affect TTM constructs. At the end of the orientation session participants received a pedometer, 6 weeks of step log sheets, self addressed envelopes, and three commercial brochures describing strategies for increasing physical activity and the risks and benefits of physical activity. Told to use the first week of the study to assess their normal number of steps and afterward to set weekly goals to increase steps based on past performance. **Comparator** No direct control **Duration/length of follow up** 6 week	Participants returned weekly step counts and completed intervention questionnaires at the beginning and end of the intervention. No incentives were given.	Participants significantly increased their total walking minutes from baseline (median 55) to post intervention (median 245, Z=4.03,p=0.001). The calculated effect size (d) was 0.82. Participants significantly increase the number of minutes they spent walking whilst at work (Z=2.79, p=0.005, d=0.63), for transport (Z=2.86, p=0.004, d=0.60) and during leisure time (Z=3.54, p=0.001, d=0.81). Participants significantly increased their use of counter conditioning, dramatic relief, reinforcement management, self-liberation, stimulus control and social liberation ($p<0.05$).	Preliminary feasibility study. No control. Sample small and homogenous.
Dinger 2007 Australia Walking	BA [+]	Aged 25 to 54 years, not full-time college students, participating in <150 minutes/week of moderate intensity physical activities and <60	Minutes spent walking during the last 7 days. M motivational readiness to become regularly physically active. Use of 20 cognitive and 20 behavioural processes of change	**Intervention** The intervention group received a pedometer and step logs. They were instructed on pedometer placement and told to wear it during all waking hours (except when in water) for the next 6 weeks. They were to record daily steps nightly on the log and to reset the pedometer each morning. Beginning the second week, they were to set a daily step goal based on the previous week's	Mann—Whitney *U*-tests were computed to assess group differences in walking minutes post-intervention and in number of stages moved pre- to post-intervention. A series of	The two groups did not differ on any outcome variable post-intervention or on stage movement pre- to post-intervention ($p < 0.05$), indicating that the additional intervention components that the intervention group received did not impact the outcomes. Consequently, the groups were combined to test whether an email-delivered, pedometer based intervention can increase scores on outcomes pre- to post-intervention. Comparator and intervention participants together increased their weekly walking minutes ($p = 0.002$) and moved forward at	

		minutes/week of vigorous physical activities, not pregnant or planning to become pregnant during the study, and answered ‘‘no’’ to Physical Activity Readiness Questionnaire n=43		step counts and to record the new goal on the log. They received weekly email reminders to wear the pedometer and return that week’s log in a self-addressed stamped envelope provided. This group also received three commercial brochures at the pre-intervention assessment, and their weekly emails contained transtheoretical model based strategies. **Comparator** The comparator group received a pedometer and step logs. They were instructed on pedometer placement and told to wear it during all waking hours (except when in water) for the next 6 weeks. They were to record daily steps nightly on the log and to reset the pedometer each morning. Beginning the second week, they were to set a daily step goal based on the previous week’s step counts and to record the new goal on the log. They received weekly email reminders to wear the pedometer and return that week’s log in a self-addressed stamped envelope provided. **Follow-up** Participants attended a pre-intervention assessment, during which they had their height and weight measured, and completed questionnaires. After 6 weeks, participants attended a post-intervention assessment to complete the questionnaires again.	ANCOVAs was computed to assess group differences in post-intervention transtheoretical model scores. Baseline score on the respective construct served as the covariate.	least one stage ($p < 0.001$). Pre-intervention, 1.8% of participants were pre-contemplators; 94.6% were contemplators; and 3.6% were preparers. In addition, 53.6% moved forward at least one stage, 5.4% regressed one stage, and 41.1% maintained their stage. All other transtheoretical model variables also changed ($p < 0.001$) except self-efficacy ($p = 0.25$). These results were supported by also finding that daily steps increased significantly from 6419±2386 during week 1 to 7984±2742 during week 6 ($p < 0.001$) for both groups combined and increases did not differ between groups.	
Dunton	RCT	Healthy	Walking	**Intervention**	Participants	Compared to the control, the intervention group	Target sample size n=200 for

2008 USA Walking	[++] Waiting list control.	women mean age 42.8 (21-65) yrs, 65% White. N=156 (85 intervention, 71 control).	Moderate to vigorous physical activity.	Individually tailored Internet plus email physical activity intervention for adult women. Received 10 weekly emails containing links to a webpage with an interactive information tailoring tool to promote physical activity. Participants received $25 after completing all of the surveys. Completed standardized inventory of 29 activities (including walking) on monthly basis. **Comparator** No intervention until after the study (waiting list control). Completed inventory. **Duration/length of follow up** 3 months	completed web based assessments of physical activity, stage of behaviour change, psychosocial variables at baseline, one month, two months and three months	increased walking (69 vs. +32 min per week) and total moderate to vigorous physical activity (+23 vs.25 min per week) after 3 months. There was no impact on stage of behaviour change or psychosocial variables. Across the whole intervention, walking increased at a faster rate in the intervention group than the control group at three months, β=15.04 (SE=8.38), p=.035 (one-tailed). After three months, the intervention group increased walking by 69 min per week, as compared to the increase by 32 min per week observed in the control group. Multilevel modelling analyses found that there was a significant group difference in the rate of change in MVPA β=17.02 (SE=10.11), p=.045 (one-tailed). Between baseline and the three months assessment, minutes per week of MVPA increased to a greater extent in the intervention group (mean increase of 23 min per week) as compared to the control group (mean decrease of 25 min per week). After three months, the proportion of participants in action or maintenance significantly increased across both the intervention and control group (OR=1.31 (95% CI=1.16–1.48) (14% for the control group and 18% for the intervention group). The rate of change in the likelihood of being in action or maintenance did not significantly differ between the two groups OR=1.16 (95% C.I.=0.93–1.4) across the three-month time period.	80% power. No significant baseline differences between intervention and control. 75% (n=117) completed surveys at all time points. Suggest extended exposure to internet based interventions may be necessary to sufficiently impact behaviour.
Eastep 2004 USA	RCT [++] Crossov	N=26 Group 1 (n=14) were 38.0 +/- 12	Walking time Step count.	**Intervention details** Study to investigate whether feedback from pedometer data motivated walking.		Neither group increased their walking time or number of steps significantly over time and interactions between groups were not significant at week 3 or 6 indicating that groups did not respond	If a motivational effect from pedometers exists it must be small, dissipate before 3 weeks, only work in combination with

Walking	er design	yrs old, and overweight (BMI= 24.7 +/- 5.0). Group 2 (n=12) were 40.5 +/- 13 yrs, and overweight (BMI= 27.5 +/- 3.8). All participants were students or employees at a large university.		Two eight week walking for fitness classes. Crossover design: group one wore pedometer for first 3 weeks (feedback condition) then sealed disguised pedometer for last 3 weeks (no feedback condition. Reversed for group 2. One class met at lunch time and another late afternoon (6pm) for 50min twice a week during one semester. Delivered by a certified physical activity specialist. Classes were designed to provide a safe walking environment and educated safety and enjoyably. Information was provided on how to increase physical activity through walking. Participants were encouraged to walk outside the class. **Comparator details** Cross over design, intervention reversed. **Duration and length of follow up** 8 weeks		directly to feedback from the pedometers. Group 1 attended 86% of the walking for fitness classes where as group 2 attended 74%.	goal setting, or only motivate certain types of individuals. Limitations: participants self selected – may have been more motivated to increase walking. Baseline step counts were not taken Small sample size. Short timeframe. Weekly step counts calculated from self reported amount of time pedometer was worn – may under or over estimate.
Faghri 2008 USA Walking	ITS [+]	Employees of two large state agencies with 1100 employees, where most jobs were sedentary. N=206 50% 45 years or older, 80% were female,	Numbers of steps taken were compared on weekly basis.. Physical activity was measured as both a subjective and an objective outcome. Stage of change was defined	**Intervention** The progressive walking program lasted for 10 weeks. Participants were allowed to choose their own walking speed and increase their speed and time walked based on level of comfort. Each day participants put on pedometers upon arriving at work, prior to getting out of their cars. Almost all of the participants drove to work or used public transportation. They then recorded the number of steps taken and minutes walked before they left work each day	At both pre- and post walking program, all participants completed a health history questionnaire, as well as a stage of behaviour change questionnaire based on Procheska's transtheoretical	Analysis of weekly logs showed that there was a significant increase in the number of steps per week for weeks 2, 3, 4, 5, 6 and 8 in comparison to baseline ($p=0.001$ for weeks 2, 3, 4, 6 and 8; $p = 0.029$ for week 5). There was a significant drop in the number of steps taken in week 7 compared to the other weeks, perhaps due to the Thanksgiving holiday. The group reached a plateau in week 8; however, 10% of the participants did not reach a plateau by the time the program ended. The average steps per person per week were 23,803 ± 1,720 steps. The average steps per day during the working hours at baseline were 4,185 ± 174 steps.	

		59% were white majority overweight with BMI of 27.3 ± 0.47 (Mean ± SD).		on individualized walking logs distributed to each participant before the study. To increase motivation, participants were encouraged to develop teams, and each team chose a team leader. The team leader was responsible for collecting the walking logs and delivering the logs to the investigators on a weekly basis. Weekly motivational emails were sent to participants and were posted on the website encouraging them to continue their walking as well as instructing them on how to set goals and overcome barriers. **Comparator** N/A **Follow-up** Of the 206 participants, 56% completed the entire 10-week program.	model for physical activity, smoking, dietary habits and stress management. The health history questionnaire also contained questions about participants' lifestyles such as level of physical activity, eating habits, stress level, smoking habits, as well as motivation to participate.. The independent variables were age, height, weight, race, and health status.	At plateau, the average steps per day during the working hours were 5,300 ± 356 steps, resulting in an increase of 27%. There was a significant increase in the physical activity reported by the participants ($p = 0.044$). With respect to self-reported physical activity level, there was a significant increase in the percentage of participants who reported that they were active at post assessment. More than one- third or 40% of the participants who reported themselves as 'not active' moved to 'active'. Overall, there was a 33% increase in the number of participants who reported being active at post assessment. T-test analysis showed that there was a significant reduction in systolic blood pressure ($p = 0.011$). Forty percent of the participants who were considered hypertensive at pre-assessment became normotensive at post-assessment. There was no significant difference in body weight, but 33% of the participants lost at least 0.5% of their body weight and another 23% maintained their weight. Furthermore, body weight, BMI and BP did not affect the number of steps taken per week	
Fisher 2004 USA Walking	RCT Cluster (+ +)	N=582 community dwelling senior residents (65 years of age or older), sedentary or inactive. In 56 neighbourhoods from a total	SF12 (Physical Mental summary scores)and life satisfaction (SWLS); the secondary outcome measure was neighbourhood walking activity, assessed at baseline, 3 months, and 6	**Intervention details** The effects of a neighbourhood walking program on quality of life among older adults. Neighbourhoods (N=56) were randomly assigned to a 6-month, 3 times per week, leader-led walking group activity (n = 28) or an information-only control group (n = 28). Neighbourhoods in the intervention	Recruited through telephone, direct mail, and referrals. Neighbourhoods corresponding to primary sampling units and residents to secondary units.	Compared to the control neighbourhoods, results from multilevel, longitudinal analyses indicated significant improvements in the primary outcomes of SF–12 Physical ($p < .05$), SF–12 Mental ($p < .05$) summary scores, and SWLS ($p<.05$), over the course of the 6-month intervention. A significant increase was also observed in the secondary outcome of walking activity ($p < .05$).	The overall response rate from 2,181 interview invitations mailed to eligible individuals was 30.5%. All individual-level data at baseline were collected during a 30- to 40-min personal interview conducted by trained research assistants. Follow-up assessments were collected through the mail and by telephone contact.

		of 93 (total population = 73,828) in Portland, Oregon. Low-income and high-minority neighbourhoods were oversampled 82% White Age 74 +/-6.3 years Female 74% A total of 582 senior residents (men = 182, women = 400) were recruited from the 56 neighbourhoods over 10 months from March through December 2001. No difference was evident at either the neighbourhood level (p = .08) or the individual	months.	condition participated in a leader-led walking program three times per week for 6 consecutive months. Walkers were also provided an informational booklet describing the benefits of walking, instruction about what to do before commencing an exercise program, precautionary medical advice, information on proper shoes and clothing, and examples of warm-up and stretching exercises. Each walking session lasted approximately 1 hr and consisted of stretching and warm-up exercises, a 30- to 40-min "leisurely, but purposeful" walk in or near their neighbourhood, and a set of "cool down" exercises. **Comparator details** Information-only control group (n = 28). Neighbourhoods in the control condition received a health education and information program, mailed regularly during the 6-month intervention period. These informational materials, were identical to those mailed to walkers in the intervention group **Duration and length of follow up** 6 months	To control for potential neighbourhood-level confounders, neighbourhoods were stratified by a "walking-friendliness" ranking variable. The 56 neighbourhoods were matched on this variable, then randomly assigned by a coin flip to either a leader-guided neighbourhood walking condition (n = 28) or an education-only control condition (n = 28).	SF–12 Mental. The mean slope for SF–12 Mental scores (M = 1.24) was statistically significant (p < .001), whereas the mean slope for the control neighbourhoods was not (M = 0.26, p = .10). The effect size for this outcome measure was 0.23. Life satisfaction. There was a significant between-neighbourhood difference in the mean slope for this variable (p = .05). Compared to the non significant mean slope in the control neighbourhoods (M = 0.013, p = .33), the mean slope was significant for the intervention neighbourhoods (M= 0.14, p < .001). The effect size for this outcome measure is 0.24 Walking activity. There was a significant difference between the intervention and control neighbourhoods (p < .05). The results indicated that a significant change occurred in the slope mean for the intervention neighbourhoods (M = 0.21, p < .001), showing an increase in neighbourhood walking. There was no observed change in the control (M = 0.01, p = .12). The slope factor intraclass correlation was 8% [0.01/(0.12 + 0.01)]. The effect size for the change in walking activity was 0.20. There was no statistically significant effect at either the neighbourhood level (p = .09, SF–12 Physical scores, p = .23; SF–12 Mental scores, p = .43; Life Satisfaction scores) or individual level (p = .31, SF–12 Physical scores; p = .82, SF–12 Mental scores, p =	Participants in the control condition were encouraged to continue their usual daily activities. They were also paid $10 per completed assessment and were eligible for a prize drawing of $100 if they completed all three study assessments. Of the 224 neighbourhood walking participants in the intervention condition, 68 (30%) withdrew. Of those who completed the intervention (n = 156), 99 (64%) attended 50 or more walk sessions, 46 (30%) attended 25 to 49 sessions, and 11 (7%) attended 7 to 24 sessions.

		level (p = .10).				.12; Life Satisfaction scores). Collectively, these results indicated no differential effects for walking-group adherence on intervention.	
Fjeldsoe BS et al Aus	RCT +	88 45 intervention, 43 control	MVPA, walking duration and frequency	**control**: initial consultation with print-based PA information (brochures about benefits, maps, vouchers for free trials). Reminder calls about 6 and 13 week assessments. Set 6 week goal at consultation, review and update at 6 week assessment **Intervention**: info pack + 2 goal setting consultations, 'fridge magnet with daily planner for weekly activity planning and self monitoring, 42 personally tailored SMS with behavioural and cognitive strategies, 11 weekly 'goal check' SMS. SMS based on SCT constructs. Nominated social support person for each participant – received 2 SMS per week	AWAS + single item to assess MVPA, assessed at baseline, 6 and 13 weeks.	MVPA Frequency (days/week) (SE) Baseline 6 13 p Int 1.80 (0.22) 1.32 (0.17) 1.82 (0.18) 0.656 Control 1.70 (0.22) 0.25 (0.17) 0.24 (0.18) 0.001 0.038 Duration (mins/week) Baseline 6 13 p Int 164.33 86.57 18.26 0.033 Control 83.95 14.63 16.36 0.255 0.082 Walking for exercise Frequency (days/week) Baseline 6 13 p Int 1.56 1.65 1.08 0.318 Control 1.12 0.28 0.73 0.004 0.023 Duration (mins/week) Baseline 6 13 p Int 83.33 78.40 16.67 0.053 Control 48.61 -10.40 0.34 0.005 0.081	Increase in days of MVPA, change in weekly duration of MVPA and walking not significant (sample size). Differences in PA between groups at baseline, low proportion of participants with low educational attainment
Gilson 2007 UK Walking	RCT [++] Baseline step counts used to randomly allocate participa	UK academic and administrative university employees N=58 women age 42 +/-10 years and 6 men age 40 +/-11 years	Step counts Body fat Waist circumference Blood pressure	**Intervention details** Two walking interventions on the work day step counts and health of UK academic and administrative university employees. Walking routes N=21 employed prescribed walks around campus with participants asked to complete at least 15min continuous brisk walking every day.	Step counts assessed at 1, 5 and 10 weeks.	A significant intervention effect ($p<0.002$) was found for step counts with mean differences indicating a decrease in steps for the control group (-767 steps/day) and increases in walking routes (+926 steps/day) and walking in tasks (+997 steps/day). Control vs. walking routes $p<0.008$, control vs. walking in tasks $p<0.005$. Small non significant changes in body fat, waist circumference and blood pressure.	No significant demographic differences between groups. Control data suggests that distributing pedometers without augmentation reduces step counts over 10 weeks.

	nts to control (maintaining normal behaviour) or one of two treatment groups			Walking in task N=21encouraged the accumulation of step counts through the working day. Rather than prescribed routes, the office, lectures and seminars were targeted as contexts where tasks were completed standing and walking rather than sitting. **Comparator details** Maintaining normal behaviour (n=22) no intervention. **Duration and length of follow up** 10 weeks			
Gilson 2009 UK Walking	RCT [++]	White-collar university staff from the UK (n = 64; age = 41.4 ± 10.4 years; 58 women), Australia (n = 70; age = 43.1 ± 10.8 years; 54 women) and Spain (n = 80; age 39.1 ± 9.7 years; 58 women	Step counts	**Intervention** Pre-intervention workday step counts and block stratification were used to randomly and equally assign participants at each site to a waiting list control or one of two intervention groups. Intervention participants were asked to increase their step counts. Employees in the first intervention group were directed to achieve this through brisk, sustained, route-based walking during work breaks. The second intervention group was asked to engage in incidental walking and accumulate step counts during working tasks – this strategy targeted walking and talking to colleagues, rather than sending emails or making telephone calls, and standing and walking in meetings, instead of sitting at desks. Importantly, participants in all groups were instructed not to engage in additional physical activities beyond those usually undertaken and – for route and incidental groups – the walking		A significant interactive effect ($F = 3.5$; $p < 0.003$) was found between group and timeline for step counts; follow-up simple effects analyses showed significant differences for routes (pre-intervention vs. week one: $t = 4.7$; $p < 0.000$) and incidental (pre intervention vs. week one: $t = 2.1$; $p < 0.038$) groups. An overall comparison of pre- against intervention average step count data showed a non-significant decrease in the control group (-391 steps/day $t = 1.76$; $p < 0.08$) and significant increases in both the routes (968 steps/day; $t = 3.9$; $p < 0.000$) and the incidental (699 steps/day; $t = 2.5$; $p < 0.014$) group. Data viewed across step count classifications, showed that the magnitude of step count change progressively increased relative to pre-intervention step count classifications. "Inactive" (<5000 daily steps) routes and incidental employees demonstrated the largest change in workday walking; comparisons with "highly active" [>12,500 daily steps] employees evidencing mean differences of 2,312 and 2,166 steps/day respectively.	

				strategies encouraged in the workplace as part of intervention. Employees were asked to report additional activities or unusual workdays in their pedometer diaries. **Comparator** Control group participants were asked to maintain their normal behaviour over a ten-week period (October-December at each site). **Follow-up** From a potential sample size of n = 214, 16% of participants (n = 35) had missing data at pre- intervention or two or more intervention measurement points – these data were removed prior to analyses, resulting in a final sample size of n = 179.			
Hemmingsson 2009 Sweden Walking/Cycling	RCT [++] (2 arm design) Stratified randomisation (age, waist circ). Intention to treat analysis.	N=120 Women age 30-60 years, mean 48.2 (7.4). Abdominally obese (waist >=88cm) Baseline mean walking 8471 steps per day (+/- 2646), bicycling 0km per day. Working at least 3 days	Treatment success defined as bicycling >=2km/day (primary outcome) or walking 10,000 steps per day. Waist circumference. Behaviour change (trans-theoretical model) .	Hypothesis: cycling success more common in intervention group, no difference for walking between groups. **Intervention** Moderate intensity programme with pedometers, physician meetings, physical activity prescriptions, group counselling, and bicycles. Trans theoretical model of behaviour change. (Encourage cycling and walking) **Comparator** Control group: low intensity group support programme with pedometers. 2hr counselling session at baseline and 6 months. (Encourage walking only). **Duration/length of follow up**	Diaries of active travel kept by participants. Waist circumference measured by research nurse.	Intervention group were more likely to achieve treatment success for cycling than controls (38.7 vs. 8.9%, OR= 7.8, 95% CI 4.0-15.0, p<0.001), but there was no difference in compliance with the walking recommendation (45.7 vs. 39.3%, OR 1.2 95% CI 0.7-2.0 p=0.5. Intervention group more likely to comply with at least one treatment goal (cycling or walking) 60.8% vs. 41.8% OR= 2.2, 95% CI 1-3-3.8 p=0.003. Commuting by car and public transport were reduced by 34% (p<0.01) and 37% (p<0.0001) with no difference between groups. Both groups achieved similar waist reductions (-2.1 and -2.6cm, p=0.72).	Attrition at 18 months was 10% (intervention) and 25% (control) p=0.03. Potential participants excluded at baseline were not S.D. to those recruited. Active commuting by bicycle was not at the expense of walking. In contrast, community by care and public transport decreased in both groups as cycling and walking increased. Both groups reduced waist circumference – authors speculate that, as pedometer

	Sample size power calc at 80% (n=120 has power of 2.8). Powered for 30% attrition.	per week.		Study duration 18 months.			data did not suggest that the control group were significantly more active in their leisure time, the intervention group may have compensated for their increased energy expenditure (cycling) by increasing their energy intake (eating more).
Hendricks 2009 USA Walking/ cycling	BA [-]	Elementary school children (KS6), working age adults. No further demographic details.	Walking (number of people) Active transport	**Intervention** 3 pronged community intervention utilising the 5P model (Preparation, Promotion, Programs, Physical Projects and Policy) to increase safe physical activity opportunities and encourage walking and biking for short trips. Aims to maximise support for individual behaviour change by integrating traditional health promotion approaches with policy and environmental projects. The focus included work on projects at elementary schools (international walk to school day and safe routes to school to increase daily walking and biking to school), worksites (Active living programmes and city wide smart commute day) and city-wide networks (including development of a multidisciplinary partnership). Promotional activities included a quarterly newsletter, monthly spont on	Not reported	Evaluation results show changes in attitudes towards active transportation (8% increase in children who thought walking to school was safer post intervention), intentions to try active commuting (43% of Smart Commute Day participants would smart commute more often post event) and increased physical activity (the number of students walking to school more than doubled at 3 of 4 intervention schools and increased at the other (no statistics given). Four schools participated in the programme for more than 2 years and all showed increases in walking to school (15-30%, 4.7-12%, 6-9%, 3-9%. No other details given) The number of people seen using active transportation increased from 1028 in 2005 to 1,853 in 2006 (63% increase).	Data presented graphically or in text so not always full detail given. Methods section of paper includes details of intervention not methods of data collection or analysis.

				the local cable channel, a new website and presence at community events Modifications were made to the physical environment including more bike lanes, and large sidewalks and trail sections. **Comparator details** No direct comparison **Duration and length of follow up** Intervention from 2003 onwards, adata gathered at various points (schools participating for 'at least two years'; community level observation at 10 locations in 2005 and 2006)			
Humpel 2004 Australia Walking	RCT [++]	Participants completing the baseline survey had a mean age of 60 F 11 years and 57% were women. Age over 40 years At baseline n = 399 Print group n = 288 (completed follow up = 181) Print + telephone group = 111	walking in the neighbourhood, walking for exercise, walking for pleasure, and walking to get to and from places.	**Intervention** The participants were randomly allocated to receive one of two physical activity programs: (1) Print only, where participants were mailed self-help print materials (three brochures and other printed materials) designed to promote walking. One brochure was mailed each week for 3 weeks; and (2) Print plus Telephone, where participants received the same print program plus three weekly telephone support calls. The print materials were three ''Walking for Health and Wellbeing'' brochures. Each one was a coloured double-sided A4 page folded (brochure style) so they could be posted in a standard envelope. Content of the brochures was designed to draw participants' attention to explicitly identifying opportunities for walking within their own neighbourhoods and local communities. Brochure 1 suggested looking around	walking in the neighbourhood, walking for exercise, walking for pleasure, and walking to get to and from places.	There were no significant differences between the two groups on any of the walking measures. The additional support of the telephone contact had no additional impact on participants' walking behaviour over the Print only program. Analyses run separately for men and women also found non-significant differences between programs. Analysis by ITT showed all participants had increased the reported number of minutes per week walking. At follow up (8-10 weeks post intervention) there were no significant differences between the two groups on any of the walking measures. Both groups significantly increased time reported walking for exercise per week: Print from 130 to 147 minutes, $t(1,277) = -3.50$, $p<0.001$; Print plus telephone from 132 to 150 minutes, $t(1,106) = -2.44$, $p<0.016$. Additionally, a trend was shown for the Print plus Telephone contact group to increase the number of minutes walking for pleasure ($p<0.06$) and to get to and from places ($p<0.06$). Significantly, more participants in the Print plus Telephone group reported receiving and reading	This study was a funded by a health insurance organization, indicating that the development of the intervention was guided by business realities.

		(completed follow-up n = 78)		the neighbourhood for things to do and places to go that might encourage them to start or increase their amount of walking. It contained information about the benefits of walking, how much walking is needed for health benefits and about barriers they may have to overcome to be more active. Brochure 2 was specifically aimed at helping participants identify and plan opportunities for walking, and how to monitor their walking program. Included with Brochure 2 were maps of local walking paths and trails. Brochure 3 offered ways to keep motivated and suggestions for social support, including contact details for nearby walking clubs. **Comparator** Participants in the Print plus Telephone group also received one telephone call each week for 3 weeks. The **Follow-up** Data were collected via mailed self-complete questionnaires at baseline and 8 to 10 weeks post-baseline. Follow-up questionnaires were received from 181 (62.8%) participants in the Print condition, and 78 (70.3%) participants in the Print plus Telephone condition.		the materials (v2 = 20.11, P < 0.0001) which may affect the reliability of the result obtained.	
Jackson 2008 USA Walking	BA [+]	290 college students. Age 24.3 +/- 7.8 years. 70% female 22% ethnic minorities. Underweight	Daily step averages for weeks 1, 6 and 12. BMI	**Intervention details** Participants wore a pedometer 5 days per week for 12 weeks and completed questionnaires assessing demographic information. Delivered through the fitness for living programme (FLP) which is a required health and fitness course taken in the	Questionnaires. Pedometer step counts	The average number of steps increased from week 1 to week 6 ($p<0.001$) and week 12 ($p=0.002$) Underweight participants reported the fewest steps at each time point but this was not significantly different to normal weight participants ($p=0.03$). The time by group interaction was not significant ($p=0.55$) indicating no difference in the pattern of increase across time for the 3 groups.	No differences in average steps between groups at baseline. Largest increase seen in first 6 weeks suggestion a shorter intervention may have been as effective.

		41 Normal weight 147 Overweight/ obese 102		first year of college. Week 1 =baseline, students given no information on recommended no. of steps. After baseline given suggested number of steps to meet recommendations, instructions for goal setting and other behaviour change strategies to gradually increase number of daily steps. Student charted daily steps using Excel. **Comparator details** No direct comparison **Duration and length of follow up** 12 weeks		65% were sedentary or low active at the start of the intervention (less than 5000 steps per day). By week 12 only 25% were sedentary or low active.	
Jancey 2008 Australia Walking	BA [+]	30 neighbourhoods within metropolitan Perth, the capital of Western Australia. participants were required to be (a) aged 65 to 74 years, (b) insufficiently active (defined as not achieving at least 30 min of moderate physical activity on at least five days a week; and	Walking time for recreation	**Intervention** The intervention program was designed to address motivators and barriers to physical activity. In particular, the local neighbourhood meeting points were aesthetically pleasing, and had facilities such as toilets and park seating available for resting. The exercise locations were easily accessible, thereby avoiding transport difficulties and costs associated with inconvenient location. The researchers contacted the Council (local government) responsible for each meeting place and informed it of the program. The walking groups met twice a week for 26 weeks. The walk leaders received a prescriptive progressive weekly exercise program that contained written information on the appropriate length for the walking program; illustrations for stretching exercises; and suitable ball skills, such as side twist leader ball. The graduated	Not reported	The self-completed International Physical Activity Questionnaire indicated that the baseline mean walking time for recreation was one hour (SD =1.65), increasing to 2.69 hours (SD =2.02) per week by the end of the program. Results of the self-completed postal satisfaction survey showed that the majority of walkers ‘‘felt fitter’’ (81%, n = 143), were ‘‘able to get more done in a day’’ (59%, n = 102), and were ‘‘more aware of health and well-being’’ (77%, n = 136). The participants acknowledged that they generally became more active (68%, n = 121), with some becoming involved in additional physical activities (26%, n = 46).	

		(c) healthy to the extent that participation in a low-stress walking program would not place them at risk for or exacerbate any existing health condition. N=260, 169 completed intervention. mean age 69 years (SD=2.89); female (67%, n=174), had a partner (66%, n=72) and Australian born (67%, n=174). All participants were insufficiently active		and standardized physical activity program commenced at a very low level and catered to the previously inactive older adults. The first meeting comprised 10 minutes of walking and two stretching exercises. By the end of 6 months, the group was physically active for one hour, which consisted of walking for 45 minutes plus doing flexibility and ball drills. This range of activities aimed to improve endurance, balance, and flexibility. **Comparator** N/A **Follow-up** A total of 65% of walkers completed the program.			
Johnston 2006 USA	nRCT [-]	47% African American 23% Asian 22% Latino 93% free school meals.	Mode of transport to school.	**Intervention** Walking School Bus. School implemented three routes staffed by parent volunteers. **Comparator details** Two nearby schools without WSB. **Duration and length of follow up** 6 months	Measured by show of hands surveys and direct observation. Surveys	Number of children who walked to school increased from baseline to follow up by 25%. A decrease in children arriving by private vehicle was also documented (no data). There were small improvements in observed street crossing safety. Comparison schools showed a decrease in the proportion of children walking to school over the same period (no data given)	Surveys completed by 695 students at baseline and 782 at follow up.

Koizumi 2009 Japan Walking	RCT [++]	N=68 women (60-78 years). LIFE n=34, age 60 to 78, mean 66 +/-4. Control n=34, age 60 to 76, mean 67 +/-4.	Quality and quantity of daily physical activity(DPA). Daily steps. Cardio respiratory endurance (12 minute walk test).	**Intervention** Lifestyle physical activity intervention. LIFE Feedback based on accelerometer DPA, number of daily steps and time spent performing daily moderate physical activity (MPA) was provided to each participant every two weeks. Recommended to accumulate 9000 steps and 30 minutes of MPA per day. During the 12 weeks, the only contact made with the participants was when they attended the local community centre to download their accelerometer data. **Comparator** No feedback. Locked accelerometer. **Duration/length of follow up** 12 weeks	Analysis of accelerometer data. 12 minute walk test.	Significant group interactions were observed for steps (f=10.53, p<0.01), MPA (f=11.76, p<0.01), and cardio respiratory endurance (f=9,28, p<0.01). Intervention group increased steps by 16% (7811 +/-3268 to 9046 +/-2620 steps), MPA by 53% (17.83 +/-13.3 to 27.23 +/-14.71 min) No changes in the control group. Intervention group increased distance walked by 10% compared to 3% in the control group (significance level not given).	
Krieger 2009 USA Walking	BA [+]	Multi-cultural public housing site. 36% African American, 29% Asian, 17% other. Female 77.4% Low income 69.5% Age: 25-44 23.4% 45-64 48.7% Over 64 26% Only 20% reported moderate physical	Self reported walking (minutes per day) Physical activity General health Social connectedness	**Intervention details** Multiple interventions to increase walking activity. Community based participatory research partnership and community action teams (made up of youth s and adults) assessed assets and barriers related to walking and developed multiple interventions to promote walking activity including sponsored walking groups, improving walking routes, providing information about walking options, advocating for pedestrian safety. Interventions included walking groups: community action group identified a1 mile path around the new central pond as a walking trail. Trained 6 staff as group leaders. Five residents also served as walk leaders. Groups met 5 times per week during weekday,	Door to door survey. Questionnaire. Sample size had power of 0.8 to detect difference of 22.6 minutes per day of walking.	Self reported walking activity increased among walking group participants from 65 to 109 minutes per day (44.1%, 95% CI 28.0-60.2, .p=0.001). The proportion that reported being at least moderately active for at least 150 minutes per week increased from 62% to 81% (change =19.2% 95% CI 2.2=36.3, p=0.018). Walking for exercise and errands both increase. There was no significant changes in walking to work or school (p=0.281), or bus stops (p=0.645).	Qualitative data: impact of walking groups. Could not distinguish the relative contributions of each strategy. Discussions among participants suggested walking group was the most potent element. The walking group continued to meet more than 18 months after: currently 3 active groups with 30 to 45 walkers (2009).

		activity at baseline (150 min/week) Walking group participants N=53 at follow up.		evening and weekend sessions. Groups ranged in size from 10 to 30. Participants received T-shirts, pedometers, and prizes for meeting individual walking goals. **Comparator details** No control group. **Duration and length of follow up** Post-test 3 months after walking groups set up.			
Lamb 2002 UK Walking	RCT [++]	The recruitment process was two staged. Firstly, a random sample of 2000 people, aged between 40 and 70 years old, with no serious medical problems were identified from the list of a large general practice (list size 26,500). The practice comprised 14 general practitioners, serving almost	Assessments were carried out before the advice session (baseline) and 6 and 12 months later. Physical activity was assessed using a postal questionnaire, based on the well validated Stanford 5 Cities physical activity questionnaire. It recorded the type, frequency and duration of physical activities undertaken in the past week. People were asked to identify moderate intensity activities, by the degree of sweat and breathlessness	**Intervention** People randomised to the health walks were treated in exactly the same manner as those in the advice only group, but in addition, they were given verbal and written information about the local health walks programme and encouraged to consider this as an option for increasing physical activity. They were referred to the local walk coordinator who telephoned each person to explain the programme in more depth and extend an invitation to join a specified walk. People received a maximum of three telephone calls. The first attempts to contact the participants were made within two weeks of the exercise seminar. The health walks programme ran in two forms. Accompanied walks were provided at several different times in the day and evening, during the week and at weekends, and were led by lay volunteers. Walk packs were available for those who might find it more convenient or preferable to walk independently. The packs included	The primary outcome was the proportion of people increasing their activity above 120 minutes of moderate intensity exercise per week. Secondary outcomes were changes in the continuously scaled physical activity variables, blood lipid profile, body mass index, blood pressure, and aerobic capacity. Statistical comparisons of the dichotomous outcomes were made using logistic regression and differences in	By 12 months the proportion of active people in the advice only group increased by 22.6% (from 4.3% to 26.9%). In the health walks group, the proportion of active people increased by 35.7% (from 3.2% to 38.9%). The difference between the groups was 13% (95% CI 0.003% to 25.9%). Analysis of the continuously scaled physical activity items supported the trend of improvement in activity. People in the health walks arm of the trial increased the frequency of moderate intensity activity more than the advice only group, but there were no statistically significant differences between groups in terms of total amount of activity. Improvements in physical activity levels took some time to occur. At six months there were only small increases in physical activity, but motivation to exercise had improved more quickly in the health walks group (c2=7.71 df=3, p=0.05). By 12 months, the advice only group had “caught up” in their motivation level (between group difference c2=1.63 df=3, p=0.65). Although there were modest, statistically significant improvements in aerobic capacity in both groups, there was no difference between the groups at 12 months. There were no statistically significant changes in body mass index,	

		entirely the population of Lower Earley, a large suburb of Reading, UK. The practice manager identified the random sample from computerised records. Postal questionnaires were sent with a cover letter from general practitioners to ascertain whether people met the study criteria and to establish their willingness to participate in a trial of physical activity promotion. The response rate was 48%. Questionnaires were returned to a research nurse who was responsible for recruiting	that resulted. The activities assessed were comprehensive, ranging from basic mobility tasks, activities of daily living through to high intensity structured exercise. Attitudes to exercise were also measured as part of the questionnaire, using the validated stages of change for exercise measure. Stage 1 was that they currently took no exercise, and were not thinking of taking up any exercise. Stage 2 was that they were thinking about exercising, but had done nothing about it in the past six months, stage 3 that they had started exercising in the past six months, and stage 4 that they were exercising	information on routes, calibrated times for each walk, and details of local points of interest. A maximum of three telephone calls was made during the year of the study to encourage people to join the scheme, each person was sent a local walk pack and promotional flyers through the post. Attendance on the walks was free of charge. Walks were designed with crèche facilities, car parking and access to public transport networks. Participants were encouraged to bring along other members or their family or friends. **Comparator** All participants attended a standardised advice session in the primary care setting, led by a physiotherapist. Sessions were conducted in groups of 10–20 people, and the topics covered were the health benefits of exercise, recommended levels of exercise for adults using published guidelines, and tips on getting started and sticking to a physical activity programme. The key message was to take at least 120 minutes/week of moderate intensity activity per week, and to choose an activity that was enjoyable and convenient. Suggested activities included swimming, racquet sports, and aerobics. Walking was also suggested as an activity, but participants in the control group were not referred to or contacted by the health walks scheme. Participants were advised that moderate intensity activity should result in at	mean changes of continuously scaled outcomes by analysis of covariance. All models were adjusted for age, sex, baseline moderate intensity activity, and aerobic capacity. Continuously scaled variables of physical activity demonstrated very skewed distributions, which were not sufficiently improved by transformation and were therefore analysed using non-parametric methods. Two analyses were undertaken. The first included all people who attended the 12 month cardiovascular fitness assessment, regardless of whether they attend health walks or increased their activity. The	cholesterol, or blood pressure in either group.	

		and randomising participants. Of the people who returned questionnaires, 438 people were eligible and potentially willing to participate in a further study. In the second stage of recruitment eligible people, who had indicated willingness to participate, were sent a letter explaining the trial in more detail. They were advised that the researchers wanted to investigate different methods of encouraging physical activity, but there was no specific mention of walking. This	regularly. Cardiovascular fitness tests were also conducted in the general practice, at each assessment interval and took about 30 minutes to complete. Blood pressure was measured using a digital monitor. Participants rested in the seated position (elbow at 90 degrees, legs uncrossed, hand at the level of the heart) for at least three minutes before the measure was taken. A non-fasting blood sample was taken for total cholesterol, and analysed under standard laboratory conditions. Weight was measured using a digital calibrated bathroom scale on a firm surface, with participants wearing light	least a slight sweat or breathlessness. Participants were encouraged to ask questions and share experiences. The seminar lasted 30 minutes, and was supplemented by general written guidance. The health walks and advice group continued to receive any advice about exercise that they sought from their general practitioner. **Follow-up** The follow-up period was one year. Loss to follow up was approximately 27% in each group. There were no statistically significant baseline differences between people who were lost to follow up and those who remained in the trial.	second was a full intention to treat analysis, in which the last known value for all missing cases was used as an imputed value. All people were analysed in the groups they were randomised to. Statistical significance was claimed at $p<0.05$. The analysis was undertaken using the statistical package SPSS for Windows version 8.5.		

		was followed up by a telephone call from a research nurse to gain consent, register, and make arrangements for the baseline assessment. Before making telephone contact with participants, the research nurse contacted the randomisation centre, and was issued with a randomly allocated series of dates from which the participant could choose to attend. Seminars were conducted for groups of people allocated to the same experimental	indoor clothing only. Height was measured using a wall mounted stadiometer, to the nearest 0.1 cm, in stocking feet, and body mass index (BMI) calculated using the formula weight/height^2 (kg/m^2). A sub-maximal step test was used to estimate age corrected $VO_{2\ max}$ from BMI, age, sex, resting and exercising pulse rate. Walk leaders collected data on attendance on organised walks.				

		group. Ten dates were allocated randomly to advice only and health walks arm of the trial a priori and the research nurse was unaware of whether the dates pertained to health walks or advice only seminars.					
Lombard 1995 USA Walking	RCT [+]	Staff and faculty members of a large south-eastern university. N= 135, 132 women and 3 men, average age 40 years (range 21 – 63 years), average weight 150lb (range 105lb to 225lb).. Subjects were randomly assigned to one of five groups.	Each week all participants completed and mailed to the project a weekly walking log. The two main outcome measures were the number of participants walking at least one day for 20 minutes in a given week in each condition and the number in each condition walking on at least three days for at least 20 minutes on each day (or meeting the ASCM goal).	**Intervention/Comparator** Research assistants telephone half the participants once a week (frequent) and the other half once every three weeks (infrequent) during the initial eight weeks of the intervention. During the last four weeks of the intervention, the research assistants called the participants in the frequent condition once every second week and the participants in the infrequent condition only once to fade the telephone prompting. The study consisted of three data point collection phases. The first phase was the intervention and lasted 12 weeks, with the data collected each week from each participant. The second phase, follow-up 1, consisted of one week of data collected one month after the completion of the intervention period	The study used a 2 x 2 design plus a control group with the two independent variables frequency of telephone prompt (once a week versus once every 3 weeks) and structure of the prompt (highly structured versus touching base). The control group received no intervention strategies beyond the minimum informational program offered to all participants.	The LD values for each set of survival curves indicated that there was a significant effect for treated (the combined four treatment conditions versus the control condition), LD= 17.661 $p<0.001$, with higher values for the participants in the treated conditions compared to those in the control condition. A significant effect for the frequency of prompting (once a week contact versus once every three weeks) , LD=17.719, $p<0.001$, with the more frequent prompted participants performing better than those prompted every third week. There was no significant difference between the prompted structure (highly structured conditions, versus touching base conditions), LD=0.007, $p<0.9349$. The authors noted that more women than men joined the program out of a population of more than 5,000 individuals (with about 50% each of men and women). An informal interview with 22 men from this population indicated that the majority of those interviewed (n=21) did not	Reported average age and weight but gave a range, assume they were reporting the median age and weight. The authors did not discuss possible contamination between groups.

		Control n=27, frequent feedback and goal setting n=27, frequent touching base n=27, infrequent feedback and goal setting n=27, and, infrequent touching base n=27.		(week 16). The thirds phase, follow-up2, consisted of two weeks of data collected three months after the intervention period (week 24). From the week a participant stopped returning a weekly log their data was entered as 0, but these participants were not eliminated from the final data set.	The study used survival analysis. The analysis conducted LEE-DESU (LD) statistics on the slopes of the different survival distributions functions to highlight any differences between conditions.	believe walking was exercise, and most (n=15) believed walking offered no health benefits. As the name of the program was 'Noontime walkers' it was concluded that men did not join because they did not believe they would benefit from a walking exercise program.	
Mackett 2005 UK Walking	BA [+]	5 primary schools N=101 pupils Varied from 41 to 3 in individual schools.	Walking rates Mode of travel to school	**Intervention details** Walking buses promoted within school, at meetings, and information sent home to parents to encourage participation. Report includes case studies on 5 primary schools as well as general information. **Comparator** None **Duration/length of follow up** Interventions ran for 18-30 months.	School travel survey questionnaires.	Around 62% of those using the walking bus had previously travelled by car. On average each child walked for 22 minutes on the walking bus each time it was used. For children that had previously walked to school the WSB resulted in an average increase of only 19 metres/day, for those that previously travelled to school by a mixture of car and walking: average increase of 309 metres/day and for those that previously regularly travelled by car to get to school: average increase of 1,549 metres/day (no statistical analyses reported). Participation in the walking buses declined over time Overall reduction in the number of children travelling by car was around 50%. The number of children using the walking bus declined over time at each location.	Poor data reporting.
McAuley 1994 USA	RCT [++]	Previous sedentary middle-aged (45-64 years of age),	Exercise behaviour, measured by program attendance, where	A 20 week exercise program was designed for middle-aged adults and employed low-impact aerobic exercise, in this case walking. Subjects exercised three times per week, exercising for 10-	Student t-tests Multivariate analyses of variance.	At the end of the 20 week program, subjects in the intervention group exercised more frequently ($p<0.01$), exercised more minutes per month (($p<0.01$) and walked more miles per week ($p<0.05$) than the control group. Only p-values	**Comments** Subjects were not followed up after the end of the program.

Walking		healthy individuals. N= 114, 56 males and 58 females. Mean age 54.52 years, SD = 5.79 years. Subjects were randomly assigned to one of four exercise classes (two intervention and two control). Two of these classes were held in a morning and two in the evening. **Intervention** Exercise (walking) and provision of efficacy-based **Comparator** Attention control group	exercise leaders kept daily attendance records, and subjects kept extensive daily logs, which were completed at the end of each exercise session and returned to the exercise leader. Duration of exercise participation at each session. Distance covered in each session. Subjects were given a map of all walking routes so subjects could calculate and record their walking distance.	15 minutes at the beginning and progressing up to 40 minutes by mid-point of the program. Subjects were led in stretching exercises by the exercise leader for approximately 10 minutes each session. They then participated in the walking program. **Intervention** Exercise and provision of efficacy-based information, mastery accomplishments, social modelling, social persuasion and interpretation of physiological states. The intervention began at the end of week 3 of the exercise program and continued into the third month of the program with six 15-minute biweekly meetings prior to exercise. **Comparator** Attention control group, in this group the subjects participated in the 20 week exercise program and also met with an investigator biweekly for the 12 week period. The intervention lasted for 20 weeks.		were given. The authors concluded that there was evidence to suggest that a simple information-based intervention program can significantly improve adherence patterns in previous sedentary middle-aged males and females.	The dropout rate was not reported, nor did the authors report if all participants completed the 20 week program. No details given on baseline characteristics.
McKee 2007 UK	nRCT (+)	Two primary schools, Scotland.	Distance travelled to school. Modes of travel.	**Intervention** Travelling Green: School based active travel project for one school term. Active travel	Children assisted to use a computerised mapping	Mean distance travelled to school by walking increased in the intervention group from 198 to 772m (389%) increase. Control group mean distance walked increased	QUAL: benefits of, motivations for, and barriers to making an active journey. Being able to walk and talk to

Walking		Two primary 5 classes, their families and teachers. N=60 (31 intervention, 29 control). 92% at follow up (29 int, 26 control). Participants lived with walking distance of school (3 miles) and were currently driven to school. Pupils mean age 9 yrs (range 9-10). 40% boys (24) 60% girls (36)	Distance travelled per mode. Behaviour change model outcome.	integrated into the curriculum, participants used interactive travel planning resources at home. Curriculum materials included resource guide for teachers, designed by Sustrans. Included ideas for making an active travel project informative, interactive, and appropriate. Additional pack of interactive tools for use in the home. Primary aim to provide practical guidance about how to plan an active journey to school. **Comparator** Control school participated in the before and after measures but did not receive the intervention. **Duration/length of follow up** Follow up 10 weeks.	programme. Online computerised questionnaire for behaviour change component.	from 242 to 285m (17%). The difference between the schools was significant (t(38)= -4.679, p<0.001 (95% CI -315 to -795m). Car travel to school decreased in the control school from 2018 to 933m (57.5%) and increased in the control school from 933 to 947m (1.5%). The difference between schools was significant (t(32) = 4.282, p<0.001 (95% CI 445-1255m). 71% (20) of the intervention group progressed to a higher "stage of change" on the behaviour change model relating to active commuting (or remained in the action and maintenance groups), compared with 52% (14) of the control group in relation to making an active journey to school.	friends on the way to school, getting lots of fresh air, and becoming healthier were regarded by both groups as the top three benefits associated with actively commuting to school. Intervention and control group children who were driven to school said they would be motivated to walk if they were driven some of the way and dropped off within walking distance, and cars were kept away from the school entrance. Significant difference in mean distance travelled to school at baseline between schools – children in intervention travelled greater distance on average. But mean walking distance low for both school and no significant difference.
Mendoza 2009 USA Walking	nRCT [+]	Public elementary schools (1 intervention, 2 controls) in Seattle. Ethnically diverse students age 5-11.	Method of transportation to school: walked with adult, walked without adult, biked, school bus, metro bus, carpool, car.	**Intervention** Walking School Bus (WSB): Part time co-ordinator and parent volunteers. Three routes ranged from 0.3 to 1.5 miles and took 15-40 minutes. WBS operated once or twice a week. **Comparator** 2 schools with no WSB **Duration/length of follow up** 1 year follow up	Students method of transportation to school was assessed by a classroom survey at baseline and 1 year follow up	At baseline the proportion of students (n=653) walking in the intervention (20% +/-2%) or control schools (15% +/- 2%) did not differ (p=0.39). At 12 months, higher proportions of students (n=643 p=0.001) walked to the intervention (25% +/- 2%) verses the control schools (7% +/-1%). There were no difference in the proportion of students riding in a car or talking the bus at 12 months (all p<0.05).	Result may underestimate the change in proportion of students who walked to school since they reflect days without scheduled WSB. However, this may suggest that WSB programmes need not operate everyday to have an impact on school travel patterns.

Merom 2005 Australia Walking	BA [+]	Adults aged 18-65 (40% aged less than 40yrs) N=1100 60% female 62% married 37% degree level education 93% English speaking 72% employed (n=794) 55% response rate	Travel mode Walking time Physical activity. Awareness of campaign	**Intervention** Australia Walk to Work Day media campaign **Comparator** No direct comparator **Duration/length of follow up** At least a year.	Pre and post campaign telephone surveys. National physical activity questionnaire. Inactive: <30min/wk activity Sufficiently active: >150min/wk activity.	Among participants who didn't usually actively commute to work was a significant decrease in "car only" use and an increase in walking combined with public transport ($p<0.005$). Overall moderate physical activity increased (+20min/week ($t[1087]=4.76$, $P<0.005$) resulting in a significant decrease in people who were inactive ($X2(1)=6.1$, $p<0.05$) and an increase in the proportion who were sufficiently active (5.4% $p<0.005$). Amongst those who were employed there was a significant increase in total walk time (+16min/week $t[780]=2.04$, $p<0.05$. Among 'passive commuters' the increase was 21min/week ($t[535] = 2.42$, $p<0.05$	Indicates short term change in behaviours. Active commuting patterns were measured on Fridays and may not reflect other days of the week. Causal contribution of walk to work day to observed effects cannot be established. Cycling was not measured separately (author note).
Merom 2007 Australia Walking	RCT [++]	Inactive adults aged 30 to 65 years, n=369, living in urban or rural regions of New South Wales, Australia, English proficient and with no physical limitations. N=123 for the self-help walking intervention group (WP), n=123 for the	The Active Australia Questionnaire was used to assess the number of times and total minutes accrued by walking continuously, for at least 10 minutes, for exercise, recreation, or to get to/from places in the past week. This was defined as all=purpose walking. The College Alumni	**Intervention** A self-help booklet, plus six weekly diaries printed on reply-paid postcards, along with a pedometer was mailed to participants in the Walking Program with Pedometer group (WPP group). The program consisted of three incremental stages, starting with short walks (<15 minutes) three days a week, typically by incidental walking, gradually increasing the duration of walks to three to four days, then (continuously) walking briskly for 30 minutes, typically for exercise to improve fitness, on most days each week. **Comparator** The Walking Program group received	The intention-to treat (ITT) principle, with baseline data carried forward for missing data, was used to determine intervention effects. Within-group changes from pre- to post-intervention were explored using McNemar's chi-square and paired *t* tests.	For the last week all purpose walking minutes, the change was twice as great in the WPP group (30 minutes) as in the WP group and control groups. For the previous three month leisure time walking session, mean changes in WPP and WP groups were significantly greater than in the control group. For the previous week all purpose walking sessions/week, mean changes in WPP and WP groups were significantly greater than in the control group; control 1.2 sessions/week (0.6-1.8) $t=3.97$ ($p<0.001$); WP 1.3 sessions/week (0.5-2.0) $t=3.32$ ($p<0.001$); WPP 2.3 sessions/week (1.6-3.1) $t=6.30$ ($p<0.001$), $X2=7.41$ ($p<0.021$). Intention to treat analysis indicated significant within group increases in all purpose walking and leisure time walking, but mean and median session and minutes were greatest in the pedometer group (WPP). The pedometer group also significantly increased	

		same walking program with a pedometer (WPP) group and for a control group n=123. n=314 completed 3 month follow-up interviews.	Questionnaire was used to assess leisure time physical activity over the last three months.	the same but without a pedometer (WP group). **Control** A control group received no treatment **Follow-up** A structured 20 minute telephone interview was conducted at baseline and at three month follow-up. The response rate for the follow-up interview was 85% (n=314)		participation in other sports and were more likely to meet physical activity recommendations by leisure time physical activity (OR =2.40, 95%CI 1.17-4.93), all purpose walking (OR=1.75, 95% CI 0.92-3.34) and all physical activity (OR=1.59, 95% CI=0.92-2.79) in the last week.	
Merom 2008 Australia Walking/Cycling	BA [+]	N=1100 Response rate 55% Working age (18-65) Female 54.8% 18-40 yrs 43% Uni degree 41% Lived 2.5km or less from work 9,6% Commuted by car only 70%	Initiating/maintaining active community (walking/cycle and public transport) on a single day and HEAC (health enhancing active community) in a usual week	**Intervention** Walk to Work Day (WTWD). Mass media campaign. Collaborative annual event in which members of the public are encouraged to walk or cycle to work. **Comparator** No direct control. **Duration/length of follow up** Follow up 1-2 months.	Telephone survey (before/after intervention)	A significant population level increase in HEAC was seen (3.9%, p=0.01) with 136 (19%) achieving HEAC post campaign.	QUAL: High confidence in incorporating walking into commute, being active pre-campaign and being younger (<46) positively associated with both outcomes.
Merom 2009 Australia Walking	RCT [++]	In active adults aged 30-65 (mean 49.1). 85% women. 92.9% from English speaking backgrounds. N=369.	Perceptions of environmental walkability. Changes in self reported walking time. Pedometer daily step count (one	**Intervention details** Individually based intervention to promote walking. Single mail out of a theoretically based self help walking programme guide: how to self regulated walking using goal setting, monitoring and recording (WP n=102), the same plus a pedometer (WPP n=105), and a no treatment control (C n=107).	Baseline interview. 13 characteristics of neighbourhood. Follow up telephone interview at 3 months.	Adjusting for baseline walking, walking times at follow up were lower if street lights or esthetics were perceived to be low (-24% and -22% respectively), compared with high (p<0.05). In low conditions WPP were significantly more likely than controls to increase total walking time (Exp (b) = 2.53, p<0.01), where as in esthetically pleasing environments, the differences between groups were non-significant. At baseline, study completers walked on average 66 min (SD 79.9) per week with a median of 40. There was no difference between low and high walkability environments. At follow up, the mean walking time was 124 min (SD 135) median 90.	

		At 3 months FU response rate = 85%.	group) Proportion of participants meeting public health recommendations by walking >150 min and >5 sessions per week.	Suggested: starting with 15 min walks 3 days/week, increase duration of walking in 3to 4 days, then focus on brisk walking for at least 30 min on most days. Guide included tips on how participants could use their existing environment for their own health benefits, or how to overcome environmental barriers. WPP also encouraged to set goals and monitor daily steps. **Comparator details** No treatment control (n=107). **Duration/length of follow up** 3 months.		Participants with a walkability score above the median reported greater increases in walking time than did their counterparts (77 vs. 33min t=2.56, p=0.011). The effect size was small: Cohen's d=0.29, 95% CI 0.07-0.51. Of the environmental dimensions, only streetlights were significantly associated with change in walking time (71 vs. 32 min t=2.42, p=0.016, but with a small effect size; Cohen's d=0.03, 95% CI 0.05=0.53. At follow up 23.9% walked regularly, a mean increase of 16.5% (-<0.001). Greatest differences between low and high categorises were observed for nearly destinations (7.6%), perceived safety (6.4%), and streetlights (4.2%). Several variables were independently associated with change in walking time: participants who were young (<55), with no children at home and not married had significantly higher levels of walking at follow up. Suggests those interested in changing walking behaviour can do so with no intervention if they have a supportive environment. A minimum contact intervention as described, can make a difference if there are environmental barriers.	
Mier 2011 USA Walking	BA [+]	N=16 Age 18+ Mean age 32.44 (+/-9.7) Mexican American women living in economically disadvantaged poorly urbanised areas on the border with Mexico. Majority born in Mexico (93.8%), unemployed (56.3%), low education (56.3%), and	Changes in walking levels (minutes) Depression Stress	**Intervention details** Home based, culturally sensitive, theoretically driven intervention facilitated by community health workers. Researchers and community workers developed Spanish physical activities workbook. Programme consisted of 12 weekly sessions and encouraged participants to accumulate at least 30 min of moderate intensity walking on most/all days of the week. **Comparator** No direct comparator **Duration/length of follow up** 12 weeks.	Data collected at baseline and 3 months. Face to face pre and post test questionnaire. Included International Physical Activity Questionnaire.	After exposure to the programme, participants reported a significant increase in walking (915.8METS minutes/week, p=0.002) lower depression (p=0.055) and stress (p=0.017) scores.	All participants attended at least 7 classes, average was 11 (92% attendance rate). Sample size small. Lack of control group. Self reported outcomes.

		obese (62.5%).					
Miyazaki 2011 Japan Walking	BA [+]	N=56 Aged 65+ (mean age 71.32 +/-3.67) BMI 24 (+/-8.8)	BMI Waist/hip Step count.	**Intervention** Subjects were given a pedometer and instructed to walk at least 7,500 steps each day. Additional monthly advice on healthy diet and lifestyle provided in a newsletter. Researches met the subjects at pre and post test only. **Comparator details** No direct control **Duration and length of follow up** 4 month intervention	No info.	Mean body mass and waist circumference decreased slightly from 59.11kg to 57.37kg ($p<0.05$) and from 87.6cm to 85.71cm $p<0.01$). Mean steps per day increased significantly from 9389 to 11846 ($p<0.01$). Among those whose steps increased by more than 1000 HDL-c increased significantly ($p<0.05$). Increased number of steps was correlated with increased HDL-c ($r=0.2751$) and was calculated at 0.7mg/dl for every 1000 extra steps ($p<0.05$).	Conference abstract only.
Moreau 2001 USA Walking	RCT [++]	Twenty-four postmenopausal women (mean age 54 ± 1 yr) with borderline to stage 1 hypertension (systolic BP of 130–159 mm Hg and/or diastolic BP of 85–99 mm Hg Fifteen women were randomized to the exercise (EX) group and 9 to a non-exercising	Blood pressure and heart rate Body mass index (BMI) was Abdominal circumference Walking steps were recorded on daily log sheets along with any additional physical activities and were collected on a biweekly basis.	**Intervention** Subjects were given a pedometer (to wear throughout the day for a 1- to 2-wk period before beginning the 24-wk walking program in order to document pre-intervention daily lifestyle walking activity. Women in this group were provided with a target number of steps that would lead to a 3-km increase in daily. The target steps were added onto their baseline step value in order to prevent a decline in their current daily lifestyle activity. Initially, all women were prescribed a distance of 1.4 km/d^{-1} above their baseline walking during week 1. The distance was then increased by 0.5 $km \cdot d^{-1}$ until the desired walking distance was achieved by the third week. The women were instructed to walk at a self-selected, comfortable pace, and were allowed to accumulate their steps in whatever pattern best fit their lifestyle. Other than walking,	Testing procedures were performed at baseline, 12 wk, and 24 wk. Statistical significance for all tests was established at $P < 0.05$.	At baseline (within their daily lifestyle activity), women in the EX and CON groups walked an average of 5400 ± 500 and 7200 ± 700 $steps \cdot d^{-1}$, respectively, equivalent to walking 3.4 ± 0.3 and 4.7 ± 0.4 $km \cdot d^{-1}$ (significantly different between EX and CON groups, $P < 0.05$). Women in the EX group increased their daily walking by 4300 steps (2.9 ± 0.2 $km \cdot d^{-1}$; significantly different from baseline and from the CON group, $P < 0.05$) and averaged a total of 9700 ± 400 $steps \cdot d^{-1}$ (including baseline steps) across the 24-wk walking program (significantly different vs. the CON group). The women in the CON group did not change their walking activity over 24 wk (-0.3 ± 0.3 $km \cdot d^{-1}$). Body mass was reduced by 0.9 ± 0.3 kg after 12 wk ($P < 0.05$) and was reduced by an additional 0.3 kg at 24 wk of walking in the EX group ($P < 0.005$), but remained constant in the CON group. There were no significant changes in abdominal and hip circumferences, over 24 wk in either the EX or CON group. Resting systolic BP was reduced in the EX group	

		control (CON) group. The women had cessation of menses for at least 1 yr and were not participating in regular physical activity within the past year. They were non-smokers, had no orthopaedic limitations to walking, and were absent of known cardiovascular disease (CVD).		subjects were asked not to make any changes in their current lifestyle activities. **Comparator** Women in the control group were asked not to change daily activity and subsequently wore a pedometer 1 wk each month to document their walking. **Follow-up** Testing procedures were performed at baseline, 12 wk, and 24 wk.		after 12 wk by 6 mm Hg ($P < 0.005$) and was further reduced by 5 mm Hg at the end of 24 wk ($P < 0.005$). There was no change in diastolic BP with walking. The CON group experienced no change in BP at either 12 or 24 wk.	
Mutrie 2002 UK Walking & Cycling	RCT [++]	Participants were recruited from three larger public sector workplaces, with a spectrum of socioeconomic groups within the workforce. in the city of Glasgow, Scotland, UK. One	Participants were sent a baseline questionnaire that measured demographic variables and contained the main outcomes measures, which were: stage of change for active commuting, seven day recall of physical activity and perceived physical and mental	**Intervention** The intervention consisted of a pack entitled 'Walk in to Work Out', which the intervention group received immediately. The pack contained a booklet with written interactive materials based on the transtheoretical model of behaviour change, educational, and practical information on: choosing routes, maintaining personal safety, shower and safe cycle storage information, and useful contacts. The pack also included an activity diary in the form of a wall chart, a workplace map, distance from local stations, local cycle retailers and outdoor shops, contacts for relevant	Focus groups were conducted after the six month responses had been received, on sub-sample of walkers and cyclists who had progressed or regressed in active commuting state of change. Those participants that had actively progressed over the first six	Over six months, a significantly larger percentage of the intervention group (49%, n=50) progressed to a higher stage of active commuting behaviour change, compared with the control group (31%, n=29). The average difference between the two groups was 18% (95% CI, 5% to 32%). Analysis of the effects of distance travelled to work, gender and age, showed that none of these variables or their interactions, significantly influenced the probability of improvement in active commuting stage of change over the first six months. **Walking** Analysis of the seven day recall of physical activity data showed a significantly greater average time per week spent walking to work for those in the intervention group compared with controls, among	The authors report significantly changes and gives confidence intervals but no p-values.

		workforce was a University, one workplace was an acute hospital trust and the third was a health board. Employees identified as contemplating or preparing to actively commute were sent a baseline questionnaire, those returning the questionnaire were included in the project. N= 295, 145 in the intervention group, 150 in the control group. The mean age was 38 years (range 19 – 69 years), 64% were women, most participants were members of social class	functioning measured by the SF-36 scale.	organisations, local maps, and reflective safety accessories. **Comparator** The control group were told they would receive the pack in six months time, they were not requested to refrain from beginning active commuting. **Follow-up** Outcomes measured at the end of the six month study period. The response rate at six months was 66% (n=194) and at 12 months after the start of the study, the response rate was 56% (n=166)	months were compared with those who did not progress or regressed. The comparison was modelled by stepwise logistic regressions on the main effects and interactions of three potential explanatory variables (age, gender and distance travelled to work) as well as study group (intervention and control).	those who had not walked to work at the start of the study (mean of 125 minutes per week for the 14 such persons in the intervention group and 61 minutes per week for the 12 in the control group). There was also a significant increase in the average time spent walking to work per week, in favour of the intervention group among those who already walked to work (mean increase from 52 minutes per week at baseline to 79 minutes per week at six months for the 61 such persons in the intervention group compared with an increase from 50 minutes to 60 minutes per week for the 43 in the control group). **Cycling** The intervention was not successful in increasing cycling; only 18 participants reported cycling to work at six months. There was no difference in the reported average weekly minutes of cycling between cyclists in the intervention group (n=9) and control group (n=9). **SF-36** A comparison of the subscales of the SF-36 from baseline to six months showed that individuals sin the intervention group, improved their scores significantly more than the control group on three of the eight subscales. For Mental Health subscale, the intervention group mean went from 72 to 76 at six months, while the control group mean were 73 and 71 for the same period. For the Vitality subscale, the mean change for the intervention group was from 57 to 64 while the control group had a mean of 61 at both time points. For the General Health subscale, the mean for the intervention group were 71 at baseline and 76 at six months and 75 and 73 respectively for the control group.	

		1 and 2 (professional and managerial).				At 12 months, the percentage of participants in the control group (after they received the pack after six months), who progressed from the stage of actively commuting behaviour change recorded at six months (46% n=31) was similar to the percentage in the intervention group who progressed their stage of change in the first six months (49% n=50). The 95% CI for the difference between the two percentages was -16% to 17%.	
Napolitano 2006 USA Walking	BA [+]	Two local worksites (hospital and administrative offices) consisting of approximately 6300 male and female employees aged 18-65. Promotional booths: At baseline, mean age was 39.7 years (SD 10.7) and 68.8% were female.	Observation of walking on path.	**Intervention** Communications based worksite campaign to promote awareness of an existing local walking path and to increase walking. Promotional material were distributed for 1 month via flyers, email, website postings, and during bi-weekly information booths. Promotional ideas were developed from initial focus groups. Organisation of walking along the "path to health". **Comparator** No direct control **Duration/length of follow up** 1 month intervention plus 2 week follow up.	Observation. Questionnaire to determine awareness. Observation = two weeks before campaign, four weeks during and two weeks after. Week days at selected 15min intervals beginning at 10am, 12pm and 2:30pm at four observation sites.	Borderline statistically significant increases in walking activity from baseline were observed midway through the campaign (p=0.069) and following the campaign (p=0.075). Counts observed during the intervention were almost triple those at baseline and increased in the post intervention phase to approximately three and a half times those at baseline. Discussion (no data): there was a trend for walking to increase during the afternoon. There was almost a tripling of walkers from baseline to post campaign. Suggests a clinically if not statistically significant difference.	Potential for "noise" in the data due to people commuting to their cars instead of walking for exercise.
Nies 2003 USA Walking	RCT [++]	The sample consisted of 197 women from metropolitan communities of states in the	Exercise benefits scale. Self efficacy. Social support.	**Intervention** Intervention participants (n= 67) received telephone calls for 24 weeks. Major components of each telephone call were scripted and followed by the research assistant. Field notes were taken during telephone conversations.	An initial model including all 4 main effects and the 3 interactions with the intervention was run.	The intervention group reported more time walked each day than did the control group ($p<0.05$). Between group analysis: Women in the intervention group reported more time walked each day than the control women ($F(1,191)=4.10$, $p<0.05$). Other measures not	Retention at 6 months was 81%. Women likely to have overestimated activity and confidence at baseline.

		north and south between the ages of 30 and 60 years (mean = 44.4 years, SD=7.5). The women were considered physically sedentary or mostly inactive at the beginning of the study based on self-report at the time of a telephone screening At baseline, the majority of women (80%) reported they were thinking about or trying to start exercising. Participants were paid $15 to participate in the study for a 6-month period. Sedentary women N=197 Age 30-60 (mean 44.4	Self reported minutes walked/day. VO2 max. Profile of mood states (POMS).	A research assistant called the women 16 times over the 24 weeks to assess their physical activity levels and to help them problem solve how to fit adequate walking activity into their week. Participants received calls once a week for the first 8 weeks and then every other week for the remaining 16 weeks. The intervention telephone calls were constructed to provide counselling on exercise benefits, goal setting, exercise efficacy, social support, restructuring plans and relapse prevention. **Attention-control** Participants assigned to the attention-control group (n = 60) received the same number of telephone calls as the intervention group. These participants were to report on their physical activity over the past week or two, but none of the intervention components were included. **Comparator** This group (n = 70) received no telephone calls but came in for baseline and 6-month assessment. **Follow-up** 6 months	To assess the intervention effects on the intervening variables ANOVA was used. Convenience sample. Paid $15. Self reported questionnaires.	significant. Within group analysis. The intervention group significantly improved reported minutes walked per day ($t(66)=3.20$, $p<0.01$), 1 mile walk test ($t(65)=3.54$, $p<0.01$). VO2 max ($t(65)=2.16$, $p<0.05$), systolic blood pressure ($t(66)=2.8$, $p<0.01$), POMS vigour ($t(66)=3.80$, $p<0.01$) and POMS fatigue ($t(66)=4.16$, $p<0.01$).	

		+/-7.5) African/European Americans					
Nies 2006 USA Walking	RCT [++]	Sample size=253 women. The women were considered physically sedentary or most inactive at the beginning of the study based on self-report at the time of a telephone screening. Women were randomly assigned to one of three groups.	Physical activity level was measured with an 11-point scale developed by the investigator. Participants checked a number from 1 to 11 indicating their current activity level. A value of 1 denotes someone who does not do any physical activity or walk and who does not intend to start in the near future. A value of 11 denotes someone who does vigorous exercise 6 or more times per week. The 7-Day Physical Activity Recall (PAR) was administered as a semi-structured interview by a trained research assistant. To assess physical fitness the	Intervention Telephone calls with counselling Telephone counselling participants received telephone calls over 24 weeks from a trained research assistant. Each person in this group received a call every week for 8 weeks and then every other week for the next 16 weeks for a total of 16 calls. The intervention telephone calls were constructed to provide counselling on exercise benefits, goal setting, exercise efficacy, social support, restructuring plans and relapse prevention. Telephone calls with no counselling Participants assigned to the brief telephone call group received the same number of telephone calls as the intervention group. These participants were to report on their physical activity over the past week or two, but none of the counselling was included Comparator The video education group received no telephone calls. The group watched a 20-minute video at baseline developed by the research team on the importance of walking and completed baseline measures. Follow-up The retention rate from baseline to 1	A latent growth analysis (LGC) modelling approach was employed to assess the relationship between time and intervention group membership across 4 domains of outcome variables.	All interventions increased the number of reported minutes walked and decreased the time to walk a mile. The best fitting model for minutes walked per week indicated a linear increase from baseline to 6 months with a moderate maintenance from 6 to 12 months. This model held true across all groups (X^2[6]=4.91, p=0.557). The best fitting model for time to walk a mile suggests a linear decrease between baseline to 6 months and maintenance of that level from 6 to 12 months (X^2[6]=1.97, p=0.921). Although all three groups were similar for both parameters, in each case there was significant within group variance.	The authors did not report on the number of participants in the three groups.

			Rockport 1-mile test was used. The profile of mood states (POMS) questionnaire was administered to assess mood of the participants	year was 81%. Assessment was made at baseline, 6 months and 1 year.			
NSW Health Department 2002 Australia	nRCT [+]	Two wards (an intervention and a control ward)	Physical activity participation rates, the proportion of people adequately active and use of local parks.	**Intervention details** The Walk It: Active Local Parks project aimed to increase participation in moderate physical activity in adults aged 25-65 years. Three parks in the intervention ward were selected to receive the park modifications and two parks from the control ward acted as control parks. The focus of the promotion campaign was raising awareness about the benefits of undertaking regular physical activity and using local parks. Activities included running an advertisement in the local newspapers, gaining publicity through feature articles, and the distribution of walking map leaflets to households in the intervention ward. An official project launch was also used to generate publicity. The publicity plan for the project, consisting of feature articles and paid advertisements. The walking maps were a double-sided, colour, A4, gloss-finish leaflet.. One side highlighted the importance of being active (and in particular walking), provided tips for being active, and had a map indicating four parks that have	telephone survey of residents from the control and intervention wards, direct observation of the five study parks, infra-red counting device to monitor park use.	Intervention ward respondents were more likely to have walked in the two weeks prior to the follow-up telephone survey than control ward respondents. Those in the intervention ward were more likely than those in the control ward to have walked in the two weeks prior to follow up (no data89.3% vs. 81.0% respectively; X2=11.51, p=0.001), and within-ward analysis indicated that walking increased from baseline in the intervention ward (X2(1)=5.85, p=0.016), but not in the control ward (X2(1)=0.07, p=0.794). A significant ward by gender interaction indicated that males in the intervention ward were 2.8 times more likely to walk than were males in the control ward whereas females in the intervention ward were only 20% more likely to walk than females in the control ward. Income, age and language significantly influenced the odds of walking. There were no significant differences between wards in the proportion of respondents that reported participating in activity at an adequate level at follow-up. There was also no measurable change from baseline to follow-up in levels of adequate activity in either ward. Gender was a significant factor, with the odds of being adequately active 30% lower for females than males. Both telephone survey and direct observation data indicated that there was no change in park use from baseline to follow-up.	The response to the telephone survey was low (20.3%) and respondents were not representative of residents in their ward in terms of education, household income, and usual language spoken at home, potentially biasing the results.

				walking trails. These included the three intervention parks and an additional park adjacent to but located outside the intervention ward. The messages promoting physical activity were consistent with NSW Health Department (1995) moderate physical activity recommendations. The reverse side of the leaflet provided more detailed maps of the walking trails in each of the parks Park modifications were undertaken in three parks within the intervention ward. Walking groups were also set up and promoted. **Comparator** Two parks in control area. **Duration/length of follow up** 2 years			
Pal 2009 Australia	RCT [++]	N=26 overweight and obese middle aged women, aged (35 – 55 yrs old), sedentary, overweight and obese women (body mass index {BMI} > 25 and < 35 kg/m2)		**Intervention** 26 overweight and obese middle-aged women were randomized into two groups: The control group was not able to record their steps daily, whilst the pedometer group, were asked to record the number of steps on a daily basis for 12 weeks. Participants in the pedometer group were told to record their pedometer steps on a daily basis for 12 weeks; those in the control group were asked to wear a sealed pedometer for 12 weeks with weekly recording. To collect baseline data, all thirty		The pedometer group significantly increased their steps/day, by 36%, at the end of the 12 weeks, whereas the control group's physical activity levels remained unchanged. There were no significant difference in the number of steps at baseline between the two groups. However, there was a significant increase in the number of steps with the pedometer group versus the control group at 6 and 12 weeks intervention ($p = 0.046$ and $p = 0.035$, respectively). At 12 weeks, the pedometer group had a 32% higher number of steps/day than the control group. The control group remained unchanged in the number of steps during the 12-week intervention. For the pedometer group, the daily average number of	

				participants were asked to wear a sealed pedometer. At baseline, both groups were then given the National Australian Physical Activity Guidelines The pedometer group was also encouraged to reach a daily step goal of 10,000 steps/day. No step goals were set for the control group. At baseline, participants from both groups were encouraged to initially set small achievable goals like 10 minute walks and then to gradually increase the goal each week to at least 30 min/day. Physical activity was assessed at baseline and at 12 weeks using short-form International Physical Activity Questionnaire (IPAQ), **Control** The control group wore sealed pedometers **Follow up** 12 weeks		steps at weeks six (8321 ± 884 steps per day) and twelve (9703 ± 921 steps per day) were significantly higher than the baseline daily average of 6242 ± 541 steps per day ($p = 0.046$ and $p = 0.035$, respectively). At week twelve, the pedometer group was taking an average of 3461 steps per day more (36% increase) than at baseline. There was no significant differences within groups or between groups in waist, BMI, waist/hip ratio, HR or % body fat at 12 weeks.	
Prestwich 2010 UK Walking	RCT [++]	N=149 (144 students, 4 non-students, 1 missing data; 54 men, 95 women; mean age = 23.44 years, SD = 5.63 years).	Behaviour measure (pre manipulation and at the 4-week follow-up). Self-report index of walking The walking subscale of the	**Intervention** To test the efficacy in promoting brisk walking of two theory-based interventions that incorporate implementation intentions and text message (Short Message Service; SMS) reminders directed at walking-related plans or goals. Each manipulation (and the information	Participants were recruited between January 15, 2007, and February 2, 2007, and completed follow-up measures 4 weeks after baseline. All participants were recruited using an	**Change in Brisk or Fast Walking** There was a differential change across groups on the primary outcome, $F(2, 130) = 3.12$, $p = .048$.1 Post hoc tests revealed that the implementation intention + plan reminder (vs. control: $p = .04$, $d = 0.49$, 95% CI [0.05, 0.94]) and the implementation intention + goal reminder (vs. control: $p = .03$, $d = 0.45$, 95% CI [0.04, 0.88]) conditions increased the number of days on which they met the physical activity daily guidelines, through brisk and fast	This study provides preliminary evidence that an intervention using physical activity-based text messages and implementation intentions can increase physical activity. Specifically, implementation intentions paired with SMS that either reminded the participants

		Participants were required to exercise less than three times per week (including brisk walking), not have a medical condition that prevented them from walking briskly, own a cell phone, and be able to attend a second (follow-up) session exactly 4 weeks after their first session. Participants received £15 ($24.74) each or course credit.	SWET requires participants to note in a table their walks during the past week; the days on which they took these walks, the duration of each walk, and the speed of each Total physical activity Height, weight, waist size, and hip size were measured. From these measures, body mass index (BMI) and waist-to-hip ratio (WHR) were calculated.	given to the control group) was presented as written text after the baseline measures were completed. **Implementation Intention + Plan Reminder** Participants in this condition received the same text as the control group. Additionally, they were informed that it can be "helpful to make very specific plans regarding how you will walk briskly five times per week and receive text message reminders of these plans." They were also told that they were free to choose the situations in which to walk that would be easy, convenient, or enjoyable for them, and they were able to decide when they would receive text message reminders of these plans. Participants were then required to complete a task to help them form plans to help them to walk five times per week. They were required to think about when and where would be the most convenient or enjoyable for them to walk 30 minutes per day for 5 days per week in bouts of at least 10 minutes, provided with suitable examples, and asked to write this plan in the form "When I'm in situation X, then I will do Y." Participants were asked whether their plans identified enough situations to enable them to walk five times per week (30 minutes/day in bouts of at least 10 min). If they answered no, they were requested to formulate additional plans and were provided with space to do so. They then stated the day(s) and time(s) when they would like to receive text	e-mail distributed to a participant database that outlined the eligibility criteria and described the study as concerning attitudes and behaviour relating to walking.	walking, significantly more than did the control group. Forty-two percent in the goal reminder condition and 45% in the plan reminder condition benefited by at least an increase of 2 days per week (compared with 22% in the control group). **Change in Total Exercise** The benefits of the amount of brisk or fast walking accrued through implementation intentions paired with text messages did not particularly have a negative impact on other physical activity. Specifically, there was a marginal difference in total physical activity across the three conditions, $F(2, 130) = 2.63$, $p = .076$. Post hoc tests indicated that the participants in the implementation intention + plan reminder condition exercised more than those in the control group ($p = .03$, $d = 0.55$; 95% CI [0.12, 1.01]). There were no differences between the other conditions (both $p > 0.12$). **Change in Weight and WHR** There was a marginal difference in the change in weight from Time 1 to Time 2 across the three conditions, $F(2, 136) = 2.42$, $p = .09$. The implementation intention + goal reminder group lost more weight than the implementation intention + plan reminder group ($p = .03$, $d = .47$, 95% CI [0.04, 0.91]). The main effect was significant when the implementation intention + goal reminder group was compared with the implementation intention + plan reminder and control groups combined, $F(1, 137) = 4.07$, $p = .046$, $d = 0.37$, 95% CI [0.03, 0.72]. The implementation intention + goal reminder group lost most weight (on average, 0.53 kg) compared with those in the other conditions (the implementation intention + plan reminder group gained an average of 0.10 kg; the control group lost an average 0.14 kg). There was no differential	of their brisk walking plans or their reasons for brisk walking significantly increased, relative to a control group, the number of days that a participant self-reported brisk or fast walking for 30 min in bouts of at least 10 min. This was achieved without significant reductions in other types of physical activity of at least moderate intensity.

				message reminders of these plans. They were required to receive at least one text message reminder of each plan. Finally, participants had to note down a username and password that would enable them, if they desired, to log onto a website to change the content of the text message reminders, the number of text message reminders they would receive, or when these text messages would be delivered. They also wrote down their username and password on a tear-off slip of paper that noted the website address and kept this sheet of paper. Unless the participants logged in to stop their text message reminders, they were sent text messages over each of the 4 weeks. **Implementation Intention + Goal Reminder** The manipulation received by this group was exactly the same as that presented to those in the implementation intention + plan reminder condition with the following difference. Although participants were requested to formulate implementation intentions, they did not receive reminders of these plans. Instead, they were informed that it would be helpful to receive reminders of their brisk walking goal. They were subsequently required to decide the days and times when they would receive these text message reminders. The participants in this condition could also log into the system to change the content of the text message reminders, the number of text message reminders they would receive,		change across the three conditions in WHR, $F(2, 136) = 0.02$, $p = .98$.	

				or when these text messages were delivered, and they received text messages for the full 4-week period. **Comparator** The control group received no text messages and was not required to form implementation intentions. However, as with all other participants, they provided their cell phone number and were informed of the current governmental guidelines for physical activity (30 minutes/day of at least moderate-intensity physical activity 5 or more days of the week) and the benefits of meeting these guidelines. Furthermore, they were told they did not meet these guidelines. Brisk walking was suggested as a good means to help them reach these targets, and they were then explicitly asked to try to walk for at least 30 minutes on 5 or more days per week (in bouts of at least 10 minutes). **Follow-up** Participants completed follow-up measures 4 weeks after baseline.			
Reger 2002 USA Walking	nRCT [+]	Sedentary and irregularly active adults aged 50 to 65 years, living in Wheeling, West Virginia, USA (n=719) A comparison group was	The number of days in a usual week they engaged in brisk walking, moderate- and vigorous-intensity exercise behaviour, and the number of hours and minutes	**Intervention** The 'Wheeling Walks' eight week campaign included paid advertising, special public relations events designed to generate additional media coverage, and public health educational activities at work sites, churches and local organisations. This was to promote 30 minutes of daily walking.	College-level research technicians observed, counted and intercepted adult walkers at five predetermined popular walking sites two hours a day for one week,	Direct observation. There was a significant effect observed,($p<0.0001$) showing a 23% increase in walking observations in the intervention community versus a 6% decrease in the comparison community (Odds ratio 1.31, 95% CI 1.14 – 1.50). Self-reported behaviour changes. Of the pre-test sedentary adults, 32.5% reached criterion in the intervention community versus 18% in the comparison community (odds ratio 2.12,	

		drawn from community of people living in Parkersburg, West Virginia, US (n=753)	devoted to the activity each day. Additionally, all self-reported total minutes of walking, moderate or vigorous activity that exceed 840 minutes (two hours a day) were recorded to equal 840 minutes.	**Comparator** No advertising campaign in comparison city. Follow-up Of the 719 in the intervention community, at the end of the eight weeks, 517 (72%) were re-interviewed and 571 of the 753 (76%) of the comparison community.	pre- and post-intervention. A telephone survey questionnaire measuring physical activity and walking habits in a random sample of households in the intervention and comparison community.	95% CI 1.41 – 2.24). Respondents in the intervention community reported walking more minutes (mean = 129 minutes) versus comparison community (mean = 87.6), p<0.003. The number of minutes reported walking also increased from pre-test (mean 63.8) to post-test (mean = 143) across both communities (p<0.001).	
Reger-Nash 2005 Australia Walking	nRCT [++]	Sedentary 50 to 65 year olds. N=1472 at baseline. N=373 intervention and 357 control at 12 months.	Daily walking (min).	**Intervention details** Mass media, community wide physical activity intervention to promote sustained changes in walking. 8 week campaign. Consisted of paid advertisements (TV, radio, cable, newspapers), public relations and community participation. Recommended at least 30 minutes of moderate intensity daily walking. Booster campaign in month 11. 16 week free walking clinic started which had in excess of 300 adult and youth participants. **Comparator** Second, no intervention community. **Duration/length of follow up** 3, 6 and 12 months post intervention.	Telephone surveys at baseline, 3,6, and 12 months. Stratified into 3 groups; A walked 10min/day or less, B walked 15-60 min/day, C walked more than 60min/day.	Intervention community had higher proportions of sufficiently active walkers over time from 3-12 months. For the most sedentary (A) this was significant at 3 months (31% vs. 17%) and 12 months (32% vs. 18%) compared to baseline. Intervention group A (sedentary) compared to control were almost twice as likely to have made any increase in their daily walking at 3 months (OR=1.93, 95%CI 1.21-3.08, p<0.01), and 12 months (OR=1.72, 95%CI 1.01-2.95) and significantly more likely to have achieved sufficiently active walking status at 3 months (OR=2.13, 95%CI 1.25-3.62 p<0.01) and 12 months (OR=1.94, 95%CI 1.06-3.55, p<0.05).	12 week planning process before intervention. Power calculation suggests 180 per group. Intervention succeed in increasing walking amongst the least active and the effect was sustained at 12 months.
Reger-Nash 2006 Australia	nRCT [+]	Interventions communities were based in West Virginia	Self reported rates of walking	**Intervention** Four community wide physical activity interventions to promote walking. Wheeling Walks, Welch Walks, BC	Evaluated using telephone survey in intervention and comparison	32% of insufficiently active persons in Wheeling reported meeting the criteria for regular walking immediately post campaign compared to an 18% increase in the comparator community (OR=2.12,	In consistent reporting of results – reported as in paper

Walking		(n=3) and New York State (n=1). No demographic details given. Each intervention community had matched control with comparable walkability.		Walks and WV Walks. Social ecological approach encouraged 10, 20 and then 30 minutes of daily moderately intense walking. 8 week multiple strategies included mass media campaign targeted insufficiently active residents (not defined). **Comparator** Each community matched with control located in same region but far enough away to have distinct local media. **Duration/length of follow up** 8 weeks.	communities before and after 8 week media campaign.	95%CI 1.41-2.24). An increase in reaching regular walking was observed for the most sedentary group in WV walks ($p<0.05$). The intervention community in Welch walks demonstrated a twofold (OR=2.0 95%CI 1.01-3.97) gain in weekly walking by at least 30 minutes versus the comparison community. 41% of the BC walks intervention community increased walking by 30 min/week compared to 30% in the control (OR=1.56 95% CI 1.07-2.28). There were no changes in any community for moderate or vigorous activity.	
Rissel 2010 Australia Cycling	nRCT [+]	A total of 1450 interviews were completed, with a response rate of 64.7 per cent. Of the 1,254 respondents at baseline who agreed to be re-contacted, 80.8% (n = 1,013) were able to be contacted, of which 909 agreed to be interviewed (89.7% response rate).	Socio-demographic characteristics (including age, sex, educational attainment, income, marital status, presence of children in the household and car ownership) were asked only at baseline. Frequency of Physical activity (PA) behaviour	**Intervention** Community based intervention. A range of project resources was produced or purchased and branded with the project name and logo. A map titled 'Discover Fairfield and Liverpool by Bike' showing the bicycle paths and useful cycling routes in the area was considered the key resource in raising awareness for non and infrequent cyclists by illustrating the extent of local bike paths. 20,000 maps were produced. A general information booklet addressing concerns of potential cyclists titled 'Thinking about cycling' was created to complement the map (n = 5,000). Water bottles (n = 2,000) and reflective slap bands (n = 2,000) were designed with specific project images to serve as cues to engage in cycling. As part of the project, a one-hour presentation was developed and delivered to 351 people	Data were collected using standard computer assisted telephone interview techniques (CATI). Pre-post changes in the cohort were examined with paired t tests for continuous variables and McNemar's test for categorical measures.	At follow-up, almost a quarter (25.8%) of respondents in the intervention group had cycled in the last year compare with 19.4% of respondents cycling in the last year in the comparison area ($p = 0.06$). However, this difference is largely explained by the higher level of cycling in the intervention area at baseline (25.2%) compared with the control area (19.3%). At follow-up, there were no differences between the intervention and comparison areas in the proportion of respondents who had cycled in the past year overall or when the data were stratified by age and sex sub-groups. Despite similar path use at baseline, there was a significantly greater use of the bicycle paths in the intervention area (28.3%) at follow-up compared with the comparison area (16.2%) ($p < 0.001$) and path use was significantly associated with an almost ten per cent increase in having cycled in the past year (29.1% in the intervention area compared with	

				attending 24 community or workplace groups between February and September 2008. The objective was to raise awareness of cycling, the benefits of physical activity, the CCC project activities and resources, and to generate discussion of how to progress to riding a bike or to riding a bike more. One of the main interventions in the early stages of the project was the offer of free cycle skills courses. These courses were designed for members of the public who wanted to ride but did not, and focused on basic skills and confidence **Comparator** No promotion **Follow-up** 24 months after baseline data collected.		20.6% in the comparison area (p = 0.010). There was also a significantly greater proportion of respondents in the intervention area who were likely to use the paths in the future (28.6%) compared with the comparison area (17.8%) (p < 0.001). Significantly more "novice"/beginner riders had cycled in the last year in the intervention area (11.5% vs.1.4% in the comparison area; p = 0.013). A greater proportion of respondents (13.5%) in the intervention area had heard of the Cycling Connecting Communities project compared with the comparison area (8.0%) (p = 0.013). Among those people who had heard of the project, there was a significantly higher proportion of respondents who had ridden in the last year in the intervention area (32.9%) compared with the comparison area (9.7%) (p = 0.014). In the intervention area, among those that had ridden in the past week there was a slight decrease in the mean minutes cycling for recreation or exercise (169.5 minutes to 152.1 minutes per week), but a large increase in the mean minutes cycling for transport (76.9 minutes to 174.2 minutes per week). In the comparison area there was a much bigger drop in the mean minutes of recreational cycling (190.3 minutes to 121.3 minutes per week) and a large drop in mean minutes of cycling for transport (197.6 minutes to 71.7 minutes per week). For the small subset of respondents that had ridden in the previous week at both baseline and follow-up (n =18) a similar pattern was observed. Overall, among those that had ridden in the past week at baseline or follow-up, there was an increase in the total mean minutes cycled in the past week from 188.6 minutes to 233.0 minutes in	

						the intervention area, compared with a decrease in the comparison area from 274.3 minutes to 134.1 minutes. Using the small subset of paired data (riding in past week at both baseline and follow-up), after adjusting for baseline levels of minutes riding, there was a significant increase in the total mean number of minutes riding in the intervention area compared with the comparison area ($p = 0.039$). The increase in minutes riding can be explained in part because of an increase in the number of times participants went riding in the past week in the intervention area (2.9 to 4.8 times), and a slight decrease in the comparison area (4.6 to 4.5). There was no significant difference between the intervention and comparison area with regard to the total mean minutes of physical activity. There was a similar amount of change in the mean minutes of physical activity - from 234.1 to 260.7 minutes per week in the comparison area, and 210.9 to 242.2 minutes per week in the intervention area. There was no statistical difference between the intervention area (48.7%) and the comparison area (53.7%) ($p = 0.130$) in the proportion of respondents meeting physical activity guidelines of 150 minutes of moderate intensity physical activity per week. However, of those people who met the physical activity guidelines, 28.1% had cycled in the past year (16.0% in the past month) compared with 16.8% of those not meeting the guidelines having cycled (6.5% in the past month) ($p < 0.001$ for both past year and past month comparisons).	
Rosenberg USA	BA (-)	Continuing care retirement communities (12).	Walking (pedometer steps) Difficulty with daily activities	At baseline, participants received pedometers and were instructed to wear them everyday for the next week and not to change their usual activity levels. They also	Weekly step counts recorded, Late Life Function and Disability	Average daily pedometer steps increased Between baseline (M = 3020; SD = 1858) and Week1 (M = 4314;SD = 2627; $t(11) = -2.99$, $p = .012$) and Week2 (M = 4246; SD = 2331; $t(11) = 3.42$, $p = .006$). Daily step	Small pilot study in older adults living in supported communities. Low baseline activity.

		10 expressing interest dropped out. Population 'congregate independent' or 'assisting living'	Quality of life (portion of SF-12)	completed surveys at this time. One week after the base line assessment (beginning of Week 1), the intervention began with a brief group education session, distribution of binders with all materials, and individual health counselling sessions with goal setting. At the beginning of Week 2, there was a second individual health counselling session with a new individualized goal for the final week. At the end of Week 2, participants' final step counts were recorded and a second survey was completed. Development of the individual, social, and environmental interventions was based on literature reviews, focus groups with seniors, and pre-testing of written materials. The main novel component was improving perceptions of the environment for supporting walking by giving participants site-tailored walking route maps. Four walking routes were selected for recommendation to participants as they had the best functionality (few streets to cross, level sidewalks in good condition, places to rest), were safe (not isolated, safe crossings with adequate time to cross), and were aesthetically pleasing (greenery and attractive views, shade) To visually display the selected routes and serve as an environmental prompt for participants to walk, several types of maps were created. An overview poster was designed that showed a map of the local area with the four recommended routes highlighted and briefly described. Two of these routes were to	Instrument and SF-12 administered at baseline, after 1 and after 2 weeks.	counts between Weeks1 and 2 were not significantly different (p = .79). All participants met their daily step goals (generally a10% increase from baseline) inWeek1 while 50% met their step goals in Week2.	Study was uncontrolled quasi-experimental with a brief intervention and small sample size. Only 55% of those initially interested completed study.

				local parks (and were 2500 and 1400 steps round trip) and one was to a local shopping plaza (1500 steps round trip). Foldable pocket-sized route cards were created for these three routes. The cards highlighted each route on a map and provided details such as amenities available (e.g., restrooms and drinking fountains) and step counts for the route. The fourth route involved a walking path around the perimeter of the facility (2000 steps around). As the facility lacked a usable map of its grounds, a map of the site was developed, highlighting the recommended perimeter route. Weekly step counts recorded, Late Life Function and Disability Instrument and SF-12 administered at baseline, after 1 and after 2 weeks.			
Rovniak 2005 USA Walking	RCT [++]	61 sedentary (less than 90 minutes physical activity per week) adult women. Age 20 to 54, mean age 40.21 +/-9.14. BMI 35.5 to 39.9. mean 26.88 +/-4.91. 82% White. 67% married 74% college educated.	1 mile walk test of fitness. Self reported walking quantity (time and distance) at baseline, post test and one year. Social cognitive theory measures	**Intervention details** Two 12 week email based walking programmes were compared. High fidelity programme designed to more precisely follow social cognitive theory (SCT) recommendations for operationalizing mastery procedures than the low fidelity programme, which was designed to simulate mastery procedures in most existing SCT physical activity programmes. Treatment contract and walking prescriptions were controlled across the groups. All participants met individually with project co-ordinator for 30 minutes. Informed of benefits of walking ,given 1 mile walk test, encouraged to plan walking and given a programme	Walking logs completed during the programme. Process evaluation post test.	The high fidelity group improved more than twice as much as the low fidelity group on 1 mile walk test time (86 +/-0.50 vs. 32 +/-0.66 seconds $p<0.01$), goal setting ($p<0.05$) and positive outcome expectations ($p<0.05$) and reported greater programme satisfaction ($p<0.001$). There was a non-significant difference in the mean change in minutes walked per week between baseline and 1 year follow up: High fidelity increased walking by 34.23min +/-81.91 compared to a low fidelity increase of 7.91min +/-47.93, $F=3.207$ $p=0.08$	Suggests theoretical fidelity might advance the quality and effectiveness of walking and physical activity interventions.

		50 completed study: 25 high fidelity, 25 low fidelity.		manual and walking log. Both groups instructed to walk 3 times per week for 30 min.. High fidelity group further instructed to walk around 2 miles each session. Both groups advised to gradually increase walking speed whilst maintaining perceived exertion, and to walk in a variety of settings. In addition, high fidelity group also received a brief modelling demonstration, more long and short term goals, more precise, immediate self monitoring and more specific feedback about performance. They were given a free wrist watch and detailed list of 20 local walking routes of around 2 miles. **Comparator details** Comparison of two interventions. **Duration and length of follow up** 12 weeks. 1 year follow up			
Rowland 2003 UK Walking/ cycling	Cluster RCT [++]	21 primary schools in London.	Walking, cycling using public transport	**Intervention details** 11 intervention schools. Travel plans were developed by a school travel co-ordinator at the intervention schools but not in the controls. **Comparator** 10 control schools **Duration/length of follow up** 12 months	Post intervention survey.	One year post intervention, 9 of 11 interventions schools and none of the 10 control schools had travel plans. The proportions of children walking, cycling, or using public transport on the school journey were not significantly different between the intervention and control schools (school travel plans did not have a significant effect). In interventions schools 70% walked, 24% travelled by car and 6% cycled or used public transport. In control schools 71% walked, 23% travelled by car and 7% cycled or used public transport. Adjusted OR = 0.98 (95% CI 0.61-1.59) for walked, cycled or took public transport.	Grouping of public transport with walking and cycling.

Ryder 2009 Canada Walking	CS [-]	5 Canadian public libraries. 41 library patrons (33F, 8M, Age 18-65+).	Self reported: Walking patterns, patterns of pedometer use, reason for borrowing pedometer, effects of pedometer use (goal setting, changes in motivation).	**Intervention** Lending pedometers to library patrons to increase walking. 90 pedometers made available for 6 months. Loan for maximum of 9 weeks. Education packages handed out with pedometer: info on pedometer use, physical activity/walking recommendations, maps of local trails, Walking Challenge Questionnaire. **Comparator** None **Duration/length of follow up** 6 months.	Questionnaire	In 6 months more than 330 pedometer loans were made. Found significant association between change in walking and motivation to walk more (X^2=8.73 p<0.05), change in walking and goal setting (X^2=9.39, p<0.05) and motivation to walk more and goal setting (X^2=12.54, p<0.001). The majority of borrowers reported wearing the pedometer on a daily basis (79.5%). Of 38 respondents who reported their walking status, 39.5% indicated they walked more since borrowing the pedometer and 60.5% reported walking about the same. None reported walking less. 92.1% indicated that the pedometer acted as a motivational tool and 78.9% indicated that the pedometer succeeded in motivating them to set a walking goal.	Did not focus on number of steps per day, but whether participants used pedometer as an incentive to increase walking behaviour in general. Those maintaining walking levels may have had satisfactory levels at baseline – future testing should take baseline measurements. Sample is small, homogenous and self selecting.
Schofield 2005 New Zealand Walking	Cluster RCT [+]	Low active adolescent girls. N= 85 Mean age 15.8 (0.8). White. Three schools, least active girls selected from descriptive study (n=415) N=68 in analysis (unusable or missing data)	Daily step counts or physical activity recall. BMI 1 mile walk test (heart rate monitors). Participants assigned by school to control (CON), pedometer (PED), or minutes of activity (MIN) group	**Intervention** Girls stepping out programme. Compared effectiveness of daily step counts with time based prescription for increasing the health related physical activity of low active adolescent girls. 12 week physical activity self monitoring and educative programme. PED group set daily step targets, MIN group set daily time based activity goals. Personal log book included 12 week log and information on how to be more active, overcoming barriers, injury prevention. PED group encouraged to increase	Pre, mid and post intervention measures . Personal log books (self reported).	PED group had significant increase in steps between baseline and week 12 and between week 6 (p<0.001), and week 12 (p<0.001), but not baseline and week 6 (p=0.11). MIN group had significant increase in steps between baseline and week 12 (p<0.01), and between week 6 and week 12 (p<0.001), but not baseline and week 6 (p=0.06). There were no significant differences between time points for CON (p=0.23). Daily step count resulted in greater increases in accumulated physical activity than time based prescription.	No significant differences between group demographics at baseline. Significant difference at baseline between groups on step count (p<0.01), but control group highest. Significant differences not seen at 6-12 week measures; PED may not be superior to MIN beyond an initial 6 week period. Short timeframe. Non-random assignment of individuals. Small sample.

				daily activity by 1-2000 steps each week until reached at least 10,000 steps per day. MIN group encouraged to increase daily activity by 10-15 minutes to daily average of 30-60 min. **Comparator** No information on control – no intervention? **Duration/length of follow up** 12 weeks; baseline (week 0), intervention phase (week 1-6), maintenance phase (week 7-12).			
Sloman 2009 UK Cycling	nRCT and BA [+]	Six towns following the first phase of the Cycling England / DfT Cycling Demonstration Town . Survey quota sample: n=1,500 aged 16+ 3 monitoring strands. 1. Automatic cycle counts across whole town, manual cycle counts, use of secondary	Changes in cycling and physical activity	**Intervention details** The towns involved in the first phase of the Cycling Demonstration Towns programme were Aylesbury, Brighton & Hove, Darlington, Derby, Exeter and Lancaster with Morecambe. One of the towns, Darlington, was also part of the Government's Sustainable Travel Town programme. More generally, all of the towns implemented a range of wider initiatives with the potential to increase cycling levels, beyond those that were directly funded by the Cycling Demonstration Towns programme – for example, through school travel planning supported by the Travelling to School Initiative; through investment in cycle facilities at new schools built as a result of the reorganisation of delivery of secondary education in Exeter; and through capital investment from the Community Infrastructure Fund for a	Cycle activity measurement by automatic cycle counters, manual counts; secondary data sources, in particular from school and workplace travel surveys; and additional monitoring mechanisms such as cycle parking counts. Two surveys of cycling activity and physical activity, carried out by ICM in all six towns in March 2006 and again in March	Mean increase in cycling levels across all six towns was 27%, relative to a 2005 baseline (to March 2009. Annual percentage change in cyclists using data from all the towns is 4%. The proportion of adult residents of the local authorities with Cycling Demonstration Towns cycling for at least 30 minutes once or more per month increased from 11.8% in 2006 to 15.1% in 2008, an increase of 3.3%-points or 28%. Meanwhile, the proportion of adult residents of the six towns who cycled regularly (that is, for at least 30 minutes 12 times or more per month) increased from 2.6% in 2006 to 3.5% in 2008, an increase of 0.9%-points or 37%. Using a validated measure of physical activity, EPIC (taking together cycling, other physical exercise, and activity at work), the proportion of adult respondents classed as inactive fell from 26.2% in 2006 to 23.6% in 2009, a fall of 2.6%-points or 10%.	The towns involved in the first phase of the Cycling Demonstration Towns programme were Aylesbury, Brighton & Hove, Darlington, Derby, Exeter and Lancaster with Morecambe. One of the towns, Darlington, was also part of the Government's Sustainable Travel Town programme Manual counts included both 'on-carriageway' cyclists and those cycling on cycle paths or tracks, while most, but not all, automatic counters were sited in traffic-free locations. Exeter and Lancaster with Morecambe, showed quite large increases in automatic cycle counts but a small decline in manual counts.

		data sources and additional monitoring such as cycle parking counts. 2. quota surveys (n=1500 in each town) together with analysis of Sport England Active People Survey to compare with towns without CDT 3. in depth interviews with local authority officers and stakeholders		cycle / pedestrian bridge in Aylesbury **Comparator details** Compared to cycle rates nationally - the general trend in medium urban areas over the period since 2005 (and indeed since 2002) was either for cycling levels (in terms of average distance cycled per person) to have been broadly stable, or perhaps, if average number of cycle trip stages are examined, to have slightly declined. Increase in cycling behaviour is not observed in matched local authorities (areas selected based on Area Classifications) Compared with London: Transport for London. Cycling levels, as measured by cycle counts on the strategic road network (the Transport for London Road Network, or TLRN), grew by 107% in the eight years between 2000/01 and 2008/09. **Duration and length of follow up** October 2006-March 2009	2009.	Pupil Level Annual School Census: the proportion of children who usually cycled to school increased by 16% or 0.3%-points (from 1.9% to 2.2%) over this 12-month period. 129 schools (46% of all schools) were offered the intensive support of a 'Bike It' officer. The proportion of pupils surveyed who 'never' cycled to school fell by 29% or 22.6%-points (from 78.5% to 55.9%) between the baseline survey at each school (in either September 2006 or September 2007) and the ex-post survey approximately 10 months later	The cycle count data show changes in the flow of cyclists passing designated points, but this does not distinguish where existing cyclists cycle more often, and new people have begun cycling. Definition of cycling activity – a trip lasting at least 30 minutes – is problematic because it fails to capture a significant proportion of (shorter) cycling trips.
Sloman 2010 UK Walking / cycling	BA [+]	Whole populations of Darlington, Peterborough and Worcester. N= at least 4000 in each site	Rates of walking Rates of cycling	**Intervention details** Sustainable travel towns. Intensive town wide Smarter Choice Programmes to encourage use of non car options; bus use, cycling and walking, and less single occupancy cars. Strategies included: Development of brand identity Large scale personal travel planning	Detailed travel surveys in 2004 and 2009. Interim household, school and workplace surveys, bus passenger counts, automated cycle and vehicle counts, manual	Cycling: the number of cycle trips per head grew substantially in all three towns by 26-30%. In comparison towns cycle trips decreased. Walking: The number of walking trips per head grew substantially by 10-13% compared to a national decline in similar towns.	Some disagreement between household survey and manual counts.

				programme Cycling and walking promotions Travel awareness campaigns Public transport information and marketing. School travel planning Workplace travel planning. **Comparator** Data from national travel survey and household survey. National road traffic estimates. **Duration/length of follow up** 2004-2009	counts,.		
Spence 2009 Canada Walking	RCT (+ +) 4 group design	N=63 female university students. 95% under 30.	Self reported walking. Walking intention. Self efficacy.	**Intervention** Pedometer and pre-test n=16, pedometer and no pre-test n=16, no pedometer and pre-test n=15, Pre-test conditions included questions on walking, interventions to walk 12,500 steps per day, and self efficacy for walking 12,500 steps per day. In the pedometer conditions, pedometer was worn for one week for all waking hours. All participants completed post test questionnaires. Those in the non-pedometer conditions were informed they could wear a pedometer the following week. **Comparator** No pedometer and no pre-test n=16 Health benefits questionnaire administered to participants in the no-pre-test groups. **Duration/length of follow up** One week intervention.	Questionnaires. Step counts.	No significant interaction was observed for either walking intention F=0.61, p=0.44, or self reported walking F=0.13, p=0.72. The effect of pedometers on walking was significant F=12.04, p=0.001. After using the pedometers for one week, those in the pedometer group formed weaker intentions (M=3.19) than those in the control group (M=3.90) to walk 12.500 steps/day in the next week. No main effect of pedometers was observed for self reported walking F=0.81, p=0.37. In comparison to the no pedometer group, the pedometer group reported more walking, F=5.22, p=0.03. However, no significant effects of the pedometer were observed for either task self efficiency or scheduling self efficiency F=0.00, p=0.98. Around 75% (N=25) returned the log sheets of their steps. This data showed no significant difference was observed in the average number of steps per day between those users who were pretested (M=10,307) and those who were not	The observed statistical power of the study was low (no further detail).

						(M=10.276, T(23)=0.04, p=0.98.	
Staunton 2003 USA Walking/ cycling	BA [+]	21 elementary and middle schools (recruited by the third year of the programme). Six schools completed survey in year 1, and 7 schools in year 2. "Only 2 schools participated in surveys both years." i.e. 11 schools in total in study.	Walking and cycling to school	**Intervention details** Safe Routes to School Programme Promote walking and cycling to school using a multi-pronged approach. The programme identifies and creates safe routes to school and invites community wide involvement. A full time educator is employed to develop the curriculum and oversee classroom education. A traffic engineer assists in identify and creating safe routes. Also have a volunteer team leader in each school **Comparator** None **Duration/length of follow up** up to approximately 18 months	Classroom surveys	Participating schools reported an increase in school trips made by walking (64%), biking (114%), and carpooling (91%), and a decrease in trips made by private vehicles carrying only one student (39%).	Only two schools participated in surveys in both years. Authors report that analysis of these two schools only produced similar results to those reported for all schools.
Sustrans Bike it 2008 UK Cycling	BA [+]	"Sample of roughly 11,000 pupils at 52 schools"	Cycling rates	**Intervention details** Bike It works directly with schools who want to increase levels of cycling to help schools to make the case for cycling in their school travel plans; supporting cycling champions in schools and demonstrating that cycling is a popular choice amongst children and their parents. The aim is to create a pro-cycling culture in the school which continues long after the Bike It officer has left. Bike It is a partnership project and which works closely with schools, parents and local authorities.	Classroom surveys Cycle shed counts	Nearly half (47%) of pupils expressed a desire to cycle to school, 3% of them already cycled to school every day and by the summer of 2007, this figure had increased to 10%. The number of pupils cycling at least once a week had increased from 10% to 27%. The number of pupils who never cycle fell from 80% to 55%, representing a marked increase in the number of new cyclists. London case study: Over 50 pupils at the school took part and together with staff and parents, they made over 300 cycle journeys during the challenge. The number of pupils cycling every day has trebled from 3% to 9% of school journeys whilst the number of pupils cycling at least once a week increased from 11% to 20%. The number of pupils	Only percentages reported. Report is written in promotional language and therefore is not critical.

				Comparator None **Duration/length of follow up** Annual report. Most individual projects measure data over a year.		who never cycle fell from 81% to 68%. A greater number of children owned a bike, up from 70% to 77% of pupils over the course of the year.	
TAPESTRY 2003 UK Walking	nRCT [+]	Primary schools (11 intervention, 2 control)	Walking to school	**Intervention details** "Targeting the environmentally aware". The TAPESTRY initiative is a three year EU sponsored project aiming to increase the knowledge and understanding of how effective communication programmes or campaigns can be developed to support and encourage sustainable travel behaviour. Interventions in school linked to national Walk to School Week. Included leaflets on benefits of walking, banners, stickers, certificates, and campaign website. Education packs are also provided. In addition classroom planners provide assistance with monitoring activity. **Comparator** Two schools **Duration/length of follow up** 4 weeks	Classroom surveys	The proportion of children walking to work at least once was not significantly different between intervention and control schools. Walking increased from 75% to 76% in interventions schools and decreased from 78% to 77% in control schools.	All intervention schools had also received walk to school campaigns, which the control schools had not received. Intervention was only 4 weeks.
Telfer 2006 Australia Cycling	BA [+]	20 CPT courses were conducted. N=113 at baseline	Cycling Other moderate physical activity. Recorded by retrospective recall.	**Intervention details** Cycling proficiency training programme for adults. Focused on practical skills development and supervised on road or cycle path training. Free courses for beginner and intermediate level cyclists were	Pre and post course self administered questionnaires. Follow up telephone	Overall, at 2 month follow up, there was no change in participants reported mean frequency or duration of cycle trips based on a 1 week activity recall. However, those not cycling in the month before the course reported an significant increase ($p<0.001$) in their mean duration in minutes of cycling. In	Of 113 people who enrolled, 81 (72%) completed at least one course (beginner or intermediate) and 105 (93%) these took part in the pre and follow up interview.

		81/113 completed post evaluation questionnaire &105/113 participated in the pre and post qual assessment 87% aged 25-54 85 (75%) female		conducted either on weekdays or weekends with each course comprising of 6 hours of tuition broken into 2 or 3 sessions. The maxim number of participants was 8. The programme was promoted through flyers, posters, media releases, articles and adverts in local news papers and on a popular TV programme. **Comparator details** **None** **Duration and length of follow up** Follow up 2 months after intervention.	interview at 2 months	addition there was a significant increase ($p<0.001$) in participants mean frequency of moderate intensity physical activity other than cycling. Of the 105 participants interviewed 2 months after the course, more than half of participants (56%) said they cycled more 2 months after the course than before the course. There was a 40% increase in participants having cycled in the previous week at follow up among baseline non-cyclists, although this was not statistically significant. There was also a significant increase in weekly participation on other forms of moderate intensity physical activity.	
TenBrink 2009 USA Walking/ cycling	ITS: [-]	Interventions aimed at City of Jackson population: a blue collar city of 36,000. Population 20% black, 74% white, 4% Hispanic. 30% <18 yrs.	Transport mode Participation Walking to school cycling	**Intervention** Project U-Turn aimed to increase active transportation (e.g. biking, walking, transit use) through an integrated approach to Active Living by Design's community action model and Michigan Safe Routes to School model. **Comparator** No direct comparator. **Duration/length of follow up** 5 years.	Transport survey (questionnaire)	The 2005 survey documented a citywide count of 1028 people using active transport, a year later this study showed an increase of 63%. Safe routes data indicated a steady increase in students who walk to school (data not given). Participation in walk to school days increase from 600 in 2003 to 1200 to 2008. Community bike programme increased cyclists using and requesting improvements to bike facilities throughout the city. Approx 60% of 100 participants reported continued use of bike for transport 1 month after receiving bike training. Smart commute day increased steadily from 165 in 2004 to 520 in 2008.	The data reporting here is poor and often anecdotal with a lack of data. A further report will not be obtained in the timeframe of this review: Hendricks K. Use of active transport in Jackson 2006: Jackson MI: Fitness Council of Jackson 2008.
Travelsmart 2006 Walking	ER [+]	Projects were conducted throughout Australia	Cycling Walking	The evaluations cover three strands of TravelSmart in Australia: households, workplaces and schools. The projects and the evaluations fall into broadly	No analysis details given	Household projects routinely showed decreases in car use of 4-15% and rise in use of walking, cycling and public transport.	There is a small amount of evidence which suggests that changes are maintained for 5 years.

/Cycling		No population data are given 5 regions	Transport mode.	two types: • small-scale pilots (typically 20–150 participants, or 1–4 organisations) • larger implementations (600–1600 participants). TravelSmart Australia brings together the many community and government based programs that are asking Australians to use alternatives to travelling in their private car. TravelSmart programs by Commonwealth, State and Territory Governments ask people to make voluntary changes in their travel choices, encouraging people to use other ways of getting about rather than driving alone in a car. For example - using buses, trains and ferries, carpooling or by cycling or walking, or by tele-working. TravelSmart asks you to think about your travel needs. Use alternative transport to the car, for example using walking, cycling and public transport. Reduce the negative impacts of the car on traffic congestion and air pollution. Recognise the health benefits of incidental exercise such as walking or cycling. Choose shops and facilities that are near you to reduce the need to travel and to support your local businesses.		Workplace results were more varied with reductions in car use of 0-60%, public transport increases of up to 50% and modest increases in walking and cycling. There are few figures for School projects, and no general results can be drawn, apart from the general observation that some reduction in family car travel does seem to occur, and there is strong support for Walking School Buses amongst schools, parents and students. All the projects reviewed used some variation on community-based marketing principles, rather than mass-media approaches. The evidence from these evaluations support this emphasis. Factors that appear to be decisive in securing travel behaviour changes are: • personal engagement at a one-to-one, household or local workplace level • functional materials—such as public transport tickets, maps, and timetables—that allow people to explore new travel options, plan and make decisions • support of local leaders—councils, senior company management, school boards • whole-of-community involvement—larger interventions appear to have larger results, suggesting that individuals are supporting and reinforcing each others' behaviour • removing incentives for car travel, penalising car use, or rewarding 'green' alternatives.	There is summary data from each project but all provided as % change only, with very little additional statistical analysis reported
Travelsmart 2009	ER [+]	Whole population. Households in	Walking Cycling Active travel	As above.		At each site there was an increase in walking for travel which ranged from 9% to 29% annual increases. Cycling for travel increased by between	Data given as percentages only in many cases, but cumulative data is compelling.

		the project areas.	Car use			14% and 69% (from variable baselines). Travel by car decreased at each site by between 10 and 14%, and overall sustainable travel trips increased at each site (between 9% and 29%). It is not immediate clear from the reports which years these changes refer to and whether each measure was taken in the same year. However, it is reported that Travelsmart consistently achieves reductions on car trips of 10% or more, reducing car travel by between 740km and 1,400km per household per year	Individual site reports have not been extracted due to time constraints.
Warren 2010 USA Walking	BA [+]	10 work sites in rural NY state. N=188. Mean age 45. White 96.8% Women.	Step count. 5 step zones (Tudor-Locke et al 2004): sedentary, low active, somewhat active, active, higher.	**Intervention** Small steps are easier together. Ecologically based intervention to increase walking by women. Pedometers and personalised daily and weekly step goals. Local strategies included walking groups, marked walking circuits and posted walking maps. **Comparator** No direct comparator **Duration/length of follow up** 10 weeks.	Baseline questionnaire. Personal activity log (self reported).	Intention to treat analysis revealed a mean increase of 1503 steps (38% increase over baseline). Mean weekly step counts values for all intervention weeks were significantly higher than baseline ($p<0.01$). Participants reaching weekly step goals was 53% on average and gradually increased from 37% to 65% at the end of the intervention. Movement to a higher step zone over baseline was found for 52% of sedentary (n=80), 29% of low active (n=65), 13% of somewhat active (n=28) and 18% of active (n=10). This placed 36% at somewhat active or higher, compared to 23% at baseline ($p<0.005$). Sedentary participants decreased from 42% at baseline to 26% at week 10 ($p<0.001$). Participants who were somewhat active or higher increased from 23% at baseline to 36% at week 10 ($p<0.01$).	Over 10 weeks mean 60.7% retention (reporting) rate. Drop outs did not differ significantly. No weight outcomes . Authors suggest longer assessment and intervention periods needed. Design does not allow efficacy of specific strategies to be considered as each site differed.
Wen 2008 Australia	Cluster RCT [+]	N=24 primary public schools in inner west	Mode of travel to and from school over 5 days	**Intervention** Health Promoting Schools Policy: Two year multi-component programme	Students completed survey in classroom.	Student survey data: both intervention and control groups increased walking by about 4% from baseline, when data was analysed by cluster, there	Mixed results with high variation in the travel patterns to and from school. Cluster

Walking/Cycling	Simple randomisation No blinding Sample size power calc at 80% (n=70 per school)	Sydney. N=2258 students.	(student reported). Travel to and from school in a usual week (parent reported). Eight options on travel to school: walked all the way, walked part of the way, went by car, went by bus or train, rode a bike.	included classroom activities, pedometer based walking activities (some schools) development of school Travel Access Guides, parent newsletters, and improving environments with local councils. **Comparator** Two year programme on healthy eating. **Duration/length of follow up** Two year follow up.	Parents completed survey at home.	were no statistically significant differences in mean percentages of change in mode of transport to or from school from baseline to follow up between the intervention and control groups. Parent survey data (n=807) indicated a significant increase in walking trips by students in the intervention compared to control schools (28.8% vs 19%, p=0.05).	analysis removed all significance. Intervention: 293/976 students and 369/772 parents lost to follow up. Control: 594/992 students completed follow up, 404/746 parents completed follow up. Design effect was 2.6, which was larger than the 1.7 anticipated, showing larger variability between than within each school cluster and compromising statistical power. QUAL: journey to school is influence by parent journey to work, degree of child independence, other family commitments and physical environment near school.
Wendel-Vos et al 2009 Netherlands	Controlled BA (+)	Men: Intervention 1187, control 349 Women: Intervention 1169, control 409 Total n=3114	Total LTPA (hrs/wk), walking (hrs/wk), bicycling (hrs/wk), sports (hrs/wk)	Intervention to decrease prevalence of CVD by encouraging people to reduce fat intake, be active and stop smoking. Between 1998 and 2003 total of 790 interventions, 590 major. 361 physical activity. Details given elsewhere. Examples include: printed guides showing walking and cycling routes, daily TV guided aerobics, information about health advantages of exercising **Duration/length of follow up** 5 years	General health questionnaires	PA outcomes: Men Change in int control adjusted diff Total LTPA -0.6 -0.2 -0.6 walking 0.2 -0.9 0.9 Cycling 0.1 0.2 -0.1 Sports -0.1 0.0 -0.2 Women Change in int control adjusted diff Total LTPA -0.4 -2.6 2.1* walking -0.3 -2.3 2.2* Cycling 0.0 -0.2 0.4	Intervention conducted in the whole community. Only one control area so unclear if changes due to intervention. Measurements in control population conducted over longer time span than in intervention, measurements in same month (baseline and follow up)

						Sports 0.1 0.1 0.1 Low educational level group Change in int control adjusted diff Total LTPA -0.3 -2.6 2.2 walking 0.0 -2.2 2.3* Cycling 0.2 -0.3 0.6* Sports -0.1 0.0 -0.1 * p<= 0.05	
Wimbush 1998 UK Walking	BA [+]	Target population: age 30-55, not regular exercisers. Fitline callers at baseline: 59% female 46% 30-55 years (20% older, 34% younger). N=3476	Knowledge/ beliefs about walking as good form of exercise. Walking/exercise behaviour: no. days in last week spend at least 30 minutes walking.	**Intervention** Mass media walking campaign in Scotland. 40 second TV advert and telephone helpline (Fitline). Advertising ran for 4 weeks in September/October 1995 and again in March/April 1996. **Comparator** No direct comparator **Duration/length of follow up** 1 year follow up.	Telephone interview – self reported outcomes.	At the population level, the authors state that the campaign had notable positive impact on knowledge about walking (with an increase from 20% before the intervention to 56% after the intervention of the population who agreed with statements such as walking is good for exercise), but no impact on walking behaviour, with number of days walked at least 30 minutes per week being 4.26 in 1995 and 4.13 in 1996 (no significance statistics given). Among helpline callers: 48% of those followed up at 1 year claimed to be more physically active, 46% reported they were exercising at the same level, and 7% reported they were less physically active (no further statistics given). In addition, there was an overall shift from contemplation towards action stage of change at both 10 week and 1 year follow up.	No control. Accuracy of recall over one year may be limited.
Wray 2005 USA Walking	CS [+]	The campaign was designed to reach adult residents of St Joseph, Missouri. A midsize town with a	To discern media-type dose exposure, individuals were first asked if they had been exposed to any campaign advertisements	**Intervention** The media plan consisted of billboard, newspaper, radio, and poster advertisements. (Television spots were not used because of the expense of buying airtime.) The strategy for media placement was to achieve the greatest visibility at	A post-campaign-only design was used: phone numbers for residents living within the city were purchased from a market	The exposed group reported a greater level of participation in three of six wellness or walking behaviours than the unexposed group at a statistically significant level. Amount of exposure was associated with the same three behaviours at a statistically significant level. Two of the outcomes were wellness behaviours: participation in a community-sponsored walk or	

		population of 84,909 in 2003. Individuals were eligible to participate if they identified themselves as adult (aged 18 years or older) residents of St Joseph. Trained callers conducted the interviews between July 31 and October 31, 2003. The survey required an average of 15 minutes to complete. A total of 297 interviews were completed with the funds available for evaluation. The total number of eligible respondents was 336.	through billboards, radio, or newspapers or if they had seen any campaign posters or news stories about the campaign to that type. The survey asked six walking behaviour questions.	the outset, in May and June, followed by reduced numbers of advertisements from July through September. In a press conference to kick off the campaign, local political leaders and coalition partners announced the Walk Missouri campaign to local radio, television, and newspaper outlets. **Comparator** N/A **Follow-up** The total number of completed interviews was 297, resulting in a cooperation rate of 88% (297/336).	research firm, and a random-digit–dial telephone survey was conducted.	participation in a health fair. The third outcome was a general walking behaviour: the number of days per week the respondent walked at least 10 minutes. Campaign-dose exposure was associated with the number of days per week walking at a statistically significant level when controlling for age and health status Post campaign, the authors report that the exposed group reported a greater level of participation in three of six wellness or walking behaviours than the unexposed group at a statistically significant level. Compared to the control group, those exposed to the campaign were more likely to participate in the sponsored walk (4.3% vs. 0.5% X2[1]=5.4, p=0.02), participate in the health fair (20% vs. 10% X2[1]=5.9, p+0.02), Those exposed to the campaign were more likely to walk for at least 10 minutes on more days of the week than the control group: (5.2 days vs. 4.52 days t[7]=2.34, p=0.02).. There was no significant difference in participation in worksite wellness, walking for at least 10 minutes during a usual week, or walking intensity. Amount of exposure is also reported to be associated with the same three behaviours at a statistically significant level;	
Zaccari	BA [+]	One primary	Walking to school	**Intervention details**	Travel diaries	The percentage of car trips decreased by 3.4% and	Evaluation was only 4 weeks.

2003 Australia Walking		school N=234 pupils (243 pupils, monitoring by travel diaries kept by 234 students)		Pupils were given a 4 week travel diary to complete. Classroom activities and weekly newsletters during term 1. Mapping routes to school, road safety audit, banner painting to explore benefits of walking to school, involvement of local press and a school assembly on Walk to School. Police enforcement to prevent pavement parking (after the evaluation period – not clear). **Comparator** **Duration/length of follow up** 4 weeks follow up		the percentage of walking trips increased by 3.4%. Journey to school comparisons between the 1st and 4th week indicated an overall increase of 6% in the number of children walking to school.	

Appendix 1

The following studies which were included in the original review have been excluded.

Avila 1994 (exercise)
Cox 2008 (exercise)
Estabrooks 2008 (measure: a conversion)
Johnson 2010 (BMI, ability to walk)
McAuley 2000 (exercise)
Merom 2003 (not about changes in cycling behaviour post intervention)
Milton 2009 (no data)
Murphy 2006 (physiological study)
Perry 2007 (physiological study, no measures of walking)
Steele 2007 (physical activity, not walking)
Vernon 2002 (physical activity, not walking)
Wen 2005 (car use)
Wilbur 2003 (does not show walking outcome)
Wilbur 2008 (does not show walking outcome)

The following studies which were excluded from the original review have been included:

Fjeldsoe 2010
Rosenberg D et al 2009
Wendel-Vos GCW et al 2009