



# Active travel intervention and physical activity behaviour: An evaluation



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## ABSTRACT

A physically active lifestyle is an important contributor to individual health and well-being. The evidence linking higher physical activity levels with better levels of morbidity and mortality is well understood. Despite this, physical inactivity remains a major global risk factor for mortality and, consequently, encouraging individuals to pursue physically active lifestyles has been an integral part of public health policy in many countries. Physical activity promotion and interventions are now firmly on national health policy agendas, including policies that promote active travel such as walking and cycling. This study evaluates one such active travel initiative, the Smarter Choices, Smarter Places programme in Scotland, intended to encourage uptake of walking, cycling and the use of public transport as more active forms of travel. House to house surveys were conducted before and after the programme intervention, in May/June 2009 and 2012 (12,411 surveys in 2009 and 9542 in 2012), for the evaluation of the programme. This paper analyses the physical activity data collected, focussing on what can be inferred from the initiative with regards to adult uptake of physical activity participation and whether, for those who participated in physical activity, the initiative impacted on meeting recommended physical activity guidelines. The results suggest that the initiative impacted positively on the likelihood of physical activity participation and meeting the recommended physical activity guidelines. Individuals in the intervention areas were on average 6% more likely to meet the physical activity guidelines compared to individuals in the non intervention areas. However, the absolute prevalence of physical activity participation declined in both intervention and control areas over time.

Our evaluation of this active transport initiative indicates that similar programmes may aid in contributing to achieving physical activity targets and adds to the international evidence base on the benefits of active travel interventions.

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## 1. Introduction

Interventions to encourage reduced car use and substitute active travel alternatives are motivated by concerns to improve health, primarily through increased physical activity in the form of walking and cycling, and to improve the environment, both locally and globally (de Nazelle et al., 2011). There have been a number of evaluations which attempt to analyse the link between such interventions and levels of physical activity associated with walking and cycling. Greenberg et al. (2005) investigated the impact of a new transit train station on American commuters walking behaviours, with one-third of those surveyed reporting additional

physical activity mainly due to an overall increase in walking activity. In a related study Besser and Dannenberg (2005) investigated daily time spent walking to and from public transport in relation to recommended physical activity guidelines and found that about 30% of their sample population met the daily recommended physical activity guideline purely from transit related walking. Yang et al. (2012) analysed the association between active travel and physical activity in the Commuting and Health in Cambridge study and concluded that active travel was associated with increased physical activity in women but there was no association for men. In an international cross-sectional comparison study, Pucher et al. (2010) investigated the relationship between active travel and physical activity, obesity, and diabetes prevalence and found significant population health gains associated with active travel behaviour. The correlation between active travel and physical activity was significantly positive whilst significantly negative

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correlations were found between active travel and obesity, and active travel and diabetes. In a systematic review assessing the effects of interventions to promote walking, [Ogilvie et al. \(2007\)](#) found that the most successful interventions could increase walking among targeted participants by up to 30–60 min a week, on average. In a similar systematic review focused on interventions to promote cycling, [Yang et al. \(2010\)](#) found only two studies which assessed the effects of interventions on physical activity and it was thus unclear whether this type of intervention resulted in an increase in overall physical activity. A recent systematic review by [Wanner et al. \(2012\)](#) found some evidence that active transport is associated with greater self-reported total physical activity.

For overall physical activity health gains to be fully realised, it is not sufficient for there to be an increase in active travel; it must also be accompanied by an increase in physical activity by individuals who do not currently meet physical activity guidelines, as it is possible that an increase in active travel might be compensated for by a decrease in activity in other domains. Although most evaluations in the literature have tended to isolate the increases in walking or cycling activity associated with an intervention and have largely failed to measure whether this leads to a compensating reduction in other physical activities, [Sahlqvist et al. \(2013\)](#), in a longitudinal study, found that increases in active travel were associated with a commensurate increase in total physical activity and not a decrease in recreational physical activity.

It should be noted that there is some evidence of health gain associated with active travel independent of overall physical activity. [Hamer and Chida's \(2008\)](#) meta-analysis demonstrated an association between active travel and reduced cardiovascular risk, suggesting independent effects of commuting activity, with different types of activity potentially providing additive benefits.

Physical activity does not need to be strenuous to have significant effects on people's health, general wellbeing and productivity. Evidence shows that active people have longer lives, lower risk of developing diseases, greater wellbeing, fewer symptoms of depression, lower rates of smoking and substance misuse and the ability to function better at work and home ([World Health Organisation – WHO, 2010](#); [Wen and Wu, 2012](#)). Physical inactivity remains one of the major global risk factors for mortality ([WHO, 2007, 2009](#)) even though the evidence linking higher physical activity levels with better levels of morbidity and mortality is well-documented ([Andersen et al., 2000](#); [WHO, 2005](#)). The World Health Organisation (WHO) recommends adults to accumulate at least 30 min of moderate activity (the equivalent of brisk walking) on most days of the week for health gains to be realised and that physical activity promotion and interventions should be an integral part of national health policy emphasising, amongst others, policies that promote active travel such as walking and cycling ([WHO, 2004](#)).

The Scottish Government in line with other European countries has adopted the WHO recommendation on physical activity ([Physical Activity Task Force, 2003](#); [The Scottish Government, 2008, 2010](#)), supporting policies making physical environments more amenable to physical activity in everyday activities as part of the Scottish physical activity strategy with the objective “to develop and maintain long lasting, high-quality physical environments to support inactive people to become more active”. Ring-fenced funding in the Public Transport Fund supports initiatives encouraging individuals to walk and cycle ([Physical Activity Task Force, 2003](#), p. 23).

One such initiative is the Scottish Government Smarter Choices, Smarter Places programme (SCSP), a pilot initiative across Scotland between 2009 and 2012 to encourage uptake of walking, cycling and the use of public transport as a more active form of travel alternative to car use. Funds were directed at seven pilot areas

across Scotland which were selected for funding on the basis of their individual plans to encourage local individuals to adopt travel patterns aiming to save them money, help to make them healthier, reduce transport emissions and develop more cohesive communities. To achieve these goals, local authorities covering the participating towns delivered complex programmes to organise, enable, promote and provide sustainable transport solutions. A more detailed table describing the intervention package can be found in an [Annex online](#).

The latest results from the Scottish Health Survey show that between 2008 and 2011 there was no significant change in the proportion of adults meeting the recommendations ([The Scottish Government, 2011](#)). In 2008, 39% of Scottish adults aged 16 and over met the physical activity guidelines, 30% did not meet the guidelines but engaged in some physical activity (30 min or more on 1–4 days a week) and 31% had been inactive (fewer than 30 min of moderate activity a week); by 2011 those percentages were, respectively, 39%, 29% and 32%. Scotland therefore has some way to go to meet its long term target for 50% of the adult population to meet the recommended guidelines by 2022.

This paper analyses the physical activity data collected for the evaluation of the SCSP programme. In particular, we focus on what can be inferred with regards to (i) adult uptake of physical activity participation and (ii) conditional on participation, the effect on adults meeting the physical activity guidelines. From a policy perspective, the results are important since they will indicate whether this type of intervention was successful in achieving one of its intended aims. Evaluation of this initiative will therefore indicate whether similar programmes will aid in contributing to achieving physical activity targets and will contribute to the international evidence base on the benefits of active travel interventions.

## 2. Methods and data

### 2.1. The SCSP programme

As is often the case with public policy changes, the SCSP was not implemented as a controlled experiment ([Blundell and Costa Dias, 2000](#)). The challenge for the evaluation was to measure the impact on changes in individual behaviour without being able to observe what would have happened without the programme.

Implementation of SCSP was restricted to seven local areas with populations ranging between 8 and 39 thousand (Barrhead, Dumfries, Dundee, Glasgow East End, Kirkintilloch/Lenzie, Kirkwall and Larbert/Stenhousemuir). These areas had been selected through a competition for funding by the Scottish Government and, as such, cannot be considered a random or representative sample of areas. For the control, data zones in the intervention areas were matched with data zones in areas which had not applied for SCSP funding and three control locations (Arbroath, Bearsden and Dalkeith) were selected on the basis of the most matches. Key observable characteristics were chosen which (i) are known to impact on travel choices at the area level (population density and car ownership) and represented the baseline level of active travel in each area (proportion cycling to work) and (ii) could be reliably identified in local area statistics. Other characteristics were considered but were rejected on the basis that many of these factors are themselves correlated (e.g. GDP and unemployment) and have less direct links with travel behaviour. In addition, as the number of parameters rose, the number of required locations with the full range on each of the key characteristics also rose. Expanding the number of control areas would have presented methodological challenges in terms of the range of potential unobservable and confounding factors. Interim analysis of travel behaviour indicated that the 3 areas taken

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