Health Promotion International, Vol. 20 No. 2
doi:10.1093/heapro/dah602
Advance access publication 18 February 2005

© The Author 2005. Published by Oxford University Press. All rights reserved.
For Permissions, please email: journals.permissions@oupjournals.org

Promoting active transport in a workplace setting: evaluation of a pilot study in Australia

LI MING WEN, NEIL ORR, JENI BINDON and CHRIS RISSEL
Health Promotion Unit, Central Sydney Area Health Service, NSW Australia

SUMMARY

*Promoting active transport is an increasingly important focus of recent health promotion initiatives addressing the major public health concerns of car dependence, decreased levels of physical activity and environmental health. Using active transport that relies less on the use of private cars and more on alternatives such as walking, cycling and public transport has the potential to increase population levels of physical activity and to improve the environment. Over 12 months, a combined social and individualized marketing campaign was delivered to a cohort of randomly selected health service employees (*n = *68) working at a health care facility in inner-city Sydney, Australia. Pre- and post-intervention surveys measured changes in mode of transport, awareness of active transport and attitudes towards mode of transport. Following the intervention, we found there was a reduction in the proportion of participants who drove to work 5 days per week and a decrease in trips travelled by car on weekends. In addition, there was high awareness of the intervention amongst participants and their understanding of the concept of active transport improved from 17.6% at baseline to 94.1% at the follow-up survey (*$p < 0.01$*). There was also a significant shift in attitudes, which suggested increased positive regard for active transport. Our findings suggest that a combined social and individualized marketing campaign in the workplace setting can increase the use of active transport for the journey to work and trips on weekends. However, before these findings are widely applied, the intervention needs to be tested in a controlled study with a larger sample size.*

Key words: active transport; evaluation; transport surveys; workplace health promotion

INTRODUCTION

Over the past two decades, both in Australia and internationally, levels of physical inactivity have increased [Stephenson *et al*., 2000; World Health Organization (WHO) Regional Office for Europe, 2002]. Physical inactivity is a major risk factor for CHD, diabetes and hypertension, and has over time become second only to smoking as an avoidable cause of illness (Stephenson *et al*., 2000). This trend of physical inactivity is evident throughout the developed world and Stephenson and Prentice argue that one explanation for this is a decline in the level of incidental physical activity, which they link to the increased use of cars and the proliferation of labour-saving devices (Prentice and Jebb, 1995; Stephenson *et al*., 2000).

Physical activity interventions, which have conventionally relied upon structured exercise programmes or recreational activities, have failed to impact upon these trends (Booth *et al*., 1997). The reasons for this failure are complex; however, a common factor identified in studies of voluntary physical activity is that these programmes tend to exclude the most needy groups who fail to become engaged because of barriers to participation (Booth *et al*., 1997).

There is an accumulating body of evidence showing that programmes that promote incidental physical activity can increase levels of physical activity in inactive populations (Sherwood and Jeffery, 2000). In addition, the health and

environmental benefits of such physical activity are now well established (US Department of Health and Human Services, 1996; Dunn *et al*., 1998). Therefore, some advocates argue that health promotion practitioners should focus their efforts on increasing physical activity as part of regular travel behaviour (Mason, 2000).

Replacing private cars for transportation by walking, cycling and public transport (which often involves walking or cycling to transport interchanges) is an effective and equitable means of increasing participation in physical activity (SigPah and National Public Health Partnership, 2001). This concept, which is sometimes referred to as 'active transport', has been recognized as a key policy direction by the WHO (WHO Regional Office for Europe, 1999). Active transport for the journey to work is one strategy that has been promoted as it benefits physical activity, as well as improving the environment. However, despite the potential impact of this strategy, there have been few interventions promoting it and little evaluation of its effectiveness.

In the most well conducted study to date, Mutrie and colleagues used a randomized controlled trial to evaluate the efficacy of an active transport information pack to increase walking and cycling to work at three workplaces in Scotland (Mutrie *et al*., 2002.) The intervention, which was based on the transtheoretical model of behaviour change, consisted of a booklet with educational and practical information on walking and cycling. In addition, it contained an activity diary, a workplace map marked with local stations, cycle retailers and outdoor shops, contacts for relevant organizations, local maps and reflective safety accessories. The authors found a significant increase in the proportion of intervention group workers who walked to work, but cycling was unaffected. Whilst this study provides the best evidence of the efficacy of active transport promotion because of the comprehensiveness and tailored nature of the intervention, its broader applicability outside of the research setting is open to question.

Oja and colleagues evaluated a health education intervention promoting active transport in a large industrial plant in Norway (Oja *et al*., 1998). The intervention consisted of information on the benefits and the possibilities for walking and cycling to work distributed through normal workplace communication channels. After a 6-month period, they found that the level of physical activity had increased; however, it was impossible to determine the impact of the change as the study did not have a control group.

There have been a limited number of active transport interventions in Australia. These include the Travelsmart Program in Perth (Transport WA, 1999), the Travel Blending Trial in Adelaide (Rose and Ampt, 2001) and the National Walk to Work Day [Commonwealth Department of Health and Aged Care (CDHAC), 2000]. Both Travelsmart and Travel Blending included an individualized marketing strategy, while National Walk to Work Day was primarily a social marketing campaign. The Travelsmart project resulted in a significant reduction in car use and increased walking in a cohort of 380 households in South Perth (Transport WA, 1999). The Travel Blending Trial resulted in a reduction in the average number of car trips by three per week, a reduction in kilometres travelled by 31 km per week, and a reduction in the total hours spent in a car by 2 h per week for participants (Rose and Ampt, 2001). However, Walk to Work Day was ineffective in changing travel behaviour and succeeded only in raising awareness of the particular intervention (CDHAC, 2000).

The potential of targeting employees in the Australian workplace for active transport programmes has been largely unexplored. In the only published study of active transport in the workplace in Australia, Travelsmart Workplace (Baudains *et al*., 2001), consisting of two interventions at six workplaces, aimed to increase walking and reduce the level of single occupant commuting. The first intervention, which was equivalent to a control condition, consisted of the promotion of walking through poster displays, guest speakers and publications. The second intervention was the same as the first, but included a volunteer environmental leader in the workplace for a few hours per week. The leader's role was to provide individuals with the opportunity to discuss their transport concerns and barriers to changes in behaviour. The authors found that the proportion of employees walking to work had increased. However, this study was evaluated using a study design where the unit of analysis was the workplace. This method of evaluation obscured the impact of the intervention upon individual employees and thus the dynamics of individual change could not be determined.

In this pilot study we set out to add to the Australian literature on active transport by evaluating a workplace active transport programme in a

health care setting. The evaluation used a cohort study design with individual employees as the unit of analysis. This allowed us to identify which individuals modified their behaviour and thus how shifts in active transport came about. Major shifts in populations are made up of small changes performed by individuals (Rose, 1992). Therefore understanding individual change is vital for the understanding of active transport at the population level. The intervention combined social and individualized marketing elements, which have been found to promote behaviour change in health promotion programmes (Moher *et al*., 2004; Sowden and Arblaster, 2004).

METHODS

Intervention

The setting

This intervention was implemented in the Queen Mary Building (QMB), a large health care facility in inner-city Sydney, Australia, in 2001. The QMB hosts ~300 staff of the Central Sydney Area Health Service (CSAHS). The reason we chose this setting was that employees are health care workers and would presumably be receptive to general health issues. In addition, the workplace is situated close to public transport nodes, making active transport a viable alternative for employees with access to public transport.

Timeline

The intervention was staged over 12 months (see Table 1) and consisted of the development of resources with target group involvement, social marketing and individualized marketing strategies. Social marketing programmes are developed to satisfy consumers needs, strategized to reach the audiences in need, and managed to meet organizational objectives (Lefebvre and Flora, 1988). Individualized marketing refers to individually tailored programmes with the same goal (Napolitano and Marcus, 2002).

Focus groups

Three focus groups with different segments of the QMB employees were conducted to develop campaign slogans and to decide on images to be used in the social marketing strategy. For the purposes of designing and implementing the intervention, employees were stratified into three groups: (i) full-time employees; (ii) part-time

Table 1: Timeline of the active transport campaign for QMB employees

Strategy	Aims	Target group	Components	Evaluation	Date
1. Social marketing	To raise awareness of active transport	All QMB employees	1. E-mail list 2. Poster displays 3. Promotional events ('Ignite your own engine day')	Baseline survey (n = 68)	September 2001 October–November 2001, October 2001–August 2002
2. Individualized marketing	To address barriers to active transport for individual study participants	Study participants (n = 64)	1. Initial interview identifying transport needs 2. Development of individualized transport plan 3. Second interview presenting transport plan to study participant	Follow up survey (n = 51)	September 2001, October 2001, March 2001 September 2002

employees; and (iii) current active transport users. Each group was attended by seven staff. In total, there were 18 females and three males, reflecting the gender distribution of staff in the QMB. Their ages ranged from 17 to 55 years (see Table 2). The focus groups provided an opportunity for the project team to better understand staff travel behaviours and motivations for modal choice.

Two strategies were used in this study in order to address the multiple levels at which transport behaviour is determined. The social marketing strategy was aimed at changing the culture of the QMB to be more aware of and supportive of active transport. The individualized marketing recognized that transport change across a population was made out of multiple individual decisions and that the intervention had to be tailored to meet these individual and contextualized needs.

Social marketing strategy

The social marketing strategy utilized campaign material and messages developed through the focus groups to promote active transport in a way appropriate to the target groups. It included four events promoting active transport, specific campaign materials, such as posters and banners, fridge magnets and a QMB Transport Access Guide (see Figure 1), and e-mail newsletters, messages on payslips and flyers. The social marketing strategy was implemented by members of the physical activity team at the CSAHS Health Promotion Unit, of which the authors are a part.

Table 2: Characteristics of focus groups participants

Characteristics	*n* (total *n* = 21)
Gender	
Male	3
Female	18
Age group (years)	
17–25	2
26–35	4
36–45	7
46–55	8
Employment status	
Full-time	11
Part-time	10
Usual mode of transport	
Active transport users	8
Car users	13
Distance to work	
⩽5 km	2
>5 km	19

Events

A series of four events were held every 3 months over the 12-month period. Approximately 30% of employees working at the QMB participated in the events. One event was an 'Information Day' that provided information on transport options, transport providers and organizations, including public transport and local bicycle user groups. The information included timetables, fares, bike maintenance, cycling and walking information and routes, and information on the health and environmental benefits of using active transport. Two of the events provided an opportunity for staff to try out the proposed alternate modes of transport to travel to work. The incentive of a healthy breakfast was provided. The events were promoted by a campaign banner placed at the front of the staff car park, and by flyer distribution and e-mail. The final event was a 'thank you' lunch at the end of the 12 months. Participants were provided with project results to date over lunch.

Poster display

The poster series depicted five images of employees who used different modes of active transport (walking, cycling, travel by train or bus, or car pooling). Most of the employees whose images were used in the posters were focus group participants. Testimonials accompanied the images to explain why they used active transport to travel to work, such as 'I walk for the environment and because it motivates me…'. The posters were exhibited during the project at the events.

E-mail 'newsletters'

E-mail 'newsletters' were used as a strategy to deliver messages to employees in the QMB. They promoted the events, available resources and provided project feedback. They were also used to communicate project updates and feedback from staff. Twenty-five staff responded to the e-mails giving positive feedback, or provided ideas or voiced their opinions on how transport, cycling parking and the environment could be improved, and also on the availability of additional resources.

Fridge magnets

The fridge magnets included graphics of four modes of transport: walking, cycling, public transport and car pooling. There were four different cartoon graphics, with images of using the different modes of transport. They carried the campaign message 'Ignite your own engine—a

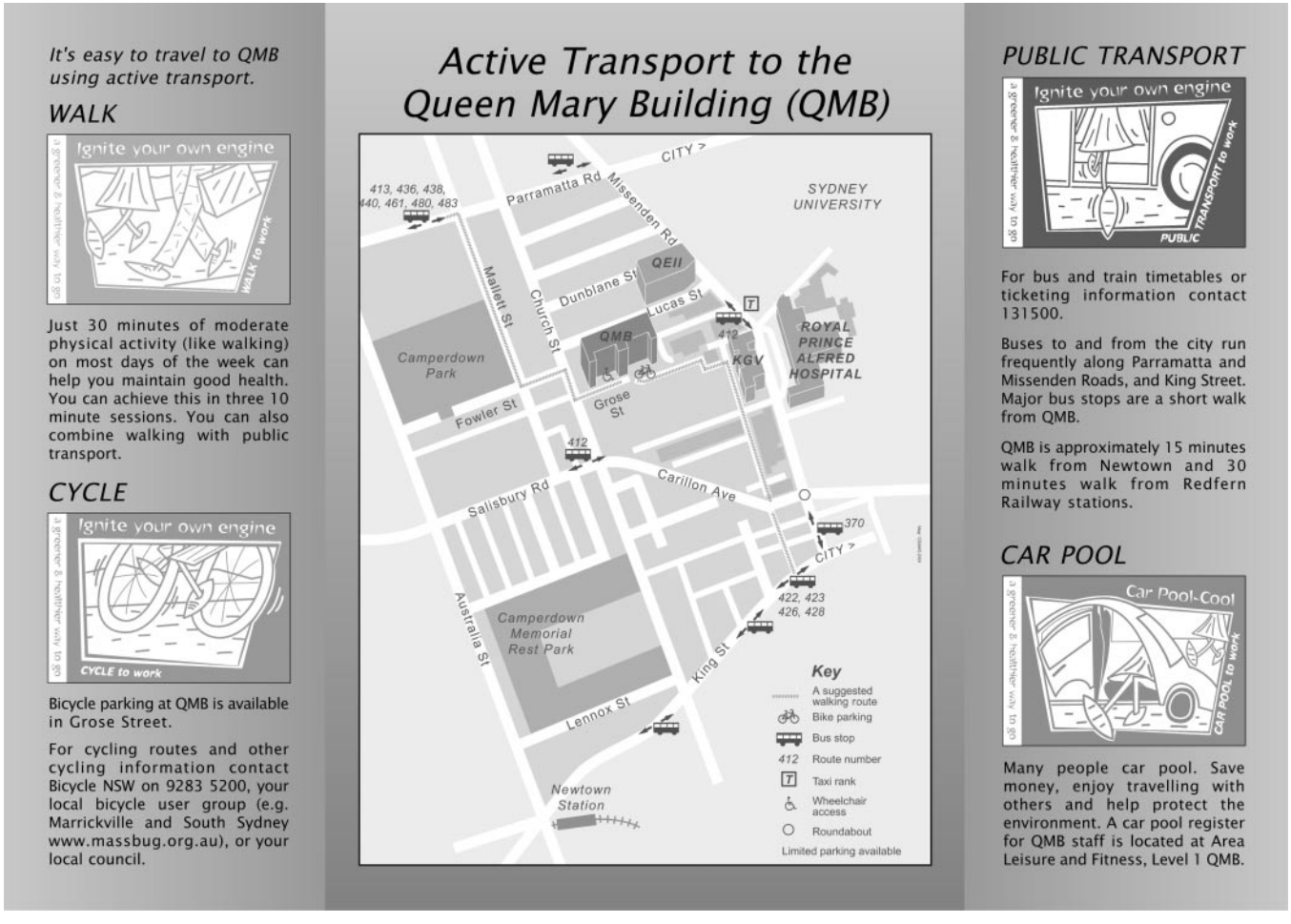

Fig. 1: Queen Mary Building, Transport Access Guide (based on RTA and SEDA guidelines).

greener and healthier way to go'. The fridge magnets were used to hang posters in the staff kitchens. They were also distributed at events and made available in the foyer of the buildings for each mode that was promoted throughout the campaign.

Queen Mary Building, Transport Access Guide

A Transport Access Guide (see Figure 1) was developed for the QMB so staff could learn alternative access routes to the building, not just where car parking was located. The Access Guide included a map of the site, surrounding main roads and streets, and showed the nearest train station, bus stops, walking and cycling routes, and bicycle parking. An electronic version was provided to hospital departments so that it could be used for visitors and clients.

Individualized marketing strategy

Individualized strategies have been found to be a very effective means of promoting behaviour change (Napolitano and Marcus, 2002). The individualized marketing strategy was delivered only to recruited study participants. This strategy was delivered in three stages. First, study participants were given an initial travel interview. In this interview the project worker gathered information on the characteristics of the participant's travel arrangements, and identified factors that were influential in transport choices (e.g. childcare). Secondly, from this information a transport plan was developed for the journey from home to work. Thirdly, a transport plan was developed with the participant, with the project worker explaining and discussing their recommendations.

Evaluation

Study design

The study was evaluated using a test–re-test survey design. Participants were a cohort of randomly selected employees who worked at the QMB between 2001 and 2002.

Study participants

Ninety-four staff were selected randomly from staff lists of CSAHS departments located in the QMB. They represented approximately one-third of employees in the QMB. This sample size was not based on any sample size calculation, rather it was based on the availability of resources. There was no additional funding for this project. Allowing for some cohort attrition, we intended to have a reasonable group to make pre- and post-intervention comparisons with. Sixty-eight employees agreed to participate and they completed the baseline survey. Over the period of the study, 17 participants were lost to follow-up, thus 51 completed both the baseline and follow-up surveys. This represents ~25% of the workforce of the QMB.

Measures

Pre- and post-intervention surveys measured changes in awareness of the concept of active transport, knowledge of active transport options, attitudes to promoting active transport, stage of change and mode of transport to work, as well as mode of transport on normal working days and Sundays. The attitudes were assessed used a standard five-point Likert scale.

Mode of transport to work was assessed in two ways: usual mode (only one choice of either walking, cycling, public transport or car) and detailed recall of each mode of transport for each trip on a normal working day (from dawn to midnight). A trip was defined as an estimated travel distance of 500 m or further.

The impact of weather conditions on choice of mode of transport was considered. The weather conditions were reported by individuals at a 10-point scale from 1 to 10 ('1' represents 'the worst' and '10' represents 'the best') for both pre- and post-intervention surveys.

The reliability and validity of the questionnaire were examined extensively. Test–re-test reliability was determined using a pilot questionnaire with 10 non-cohort employees. The correlation coefficients were >0.7 for all the variables. Face and content validities of the questionnaire were also tested by wide consultation with health promotion employees and experts.

Data collection

Face-to-face interviews were conducted by four trained interviewers for both pre- and post-intervention surveys, in September 2001 and 2002, respectively. The baseline survey was conducted ~1 month before the commencement of the individualized marketing strategy. The follow-up survey was conducted 2 months after the strategies had ceased. The questionnaires for both baseline and follow-up were identical.

Data analysis

Paired sample *t*-tests between means were used to compare the changes in continuous variables.

McNemar's test for paired proportions was used to compare the changes in dichotomous variables and the marginal homogeneity test was used for multinomial variables. The data were analysed using the computer package SPSS for Windows 8.0.

RESULTS

Response rates and characteristics of the study sample

Ninety-four employees were selected randomly from employees lists, with 68 people completing interviews at baseline and giving consent to be re-interviewed after 1 year, giving an 81% response rate after excluding 10 employees who were not available during the recruitment period. Fifty-one people remained in the study and completed the post-intervention interview, giving a 75% follow-up rate.

Table 3 shows the main characteristics of the study sample and participants who were lost to follow-up. The main characteristics except for the usual mode of transport to work were similar between the study participants and participants lost to follow-up. There were no statistically significant differences between the groups.

Awareness of the intervention

Awareness of the intervention was determined using an unprompted recall question, which asked participants about their recall of health promotion campaigns in the QMB. Awareness was substantiated further by a prompted recall question that mentioned specific intervention campaign messages.

Following the intervention there were significant increases in all aspects of recall (see Table 4): unprompted recall increased from 9.8% to 49.0% ($p < 0.05$); prompted recall increased from 17.6% to 94.1%($p < 0.001$); awareness of the term 'active transport' increased from 27.5% to 70.6% ($p < 0.001$); and having seen or used the 'active transport to the QMB' map (campaign material) increased from 9.8% to 56.9% ($p < 0.001$).

Table 3: Main characteristics of the study sample and subjects who were lost to follow-up

	Study subjects (total $n = 51$)	Lost to follow-up (total $n = 17$)
Gender		
Males	13 (25.5%)	4 (23.5%)
Females	38 (74.5%)	13 (76.5%)
Age		
Mean	38.3	37.6
Median	38	37
Mode	30	30
Distance to work		
⩽5 km	18 (26.5%)	5 (29.4%)
>5 km	50 (73.5%)	12 (70.6%)
Usual mode of transport to work at baseline		
Active transport users[a]	19 (37.3%)	7 (41.1%)
Car users[b]	32 (62.7%)	10 (58.8%)

[a]Including walking, cycling, or travelling by train or bus.
[b]Including being a driver or a passenger.
Note: no statistical difference between the groups in the variables was measured.

Attitudes to active transport

Attitudes towards active transport were determined using travel behaviour questions. These questions were scored on a scale from 'strongly agree' to 'strongly disagree' (listed in Table 5). Significant changes in attitudes to active transport were found in all but one item, suggesting that overall participants had a more positive attitude to active transport following the intervention.

Stage of change

Stage of change in car usage to work was assessed among car users. The positive changes were also found in the stage of change in car usage to work (Table 6). There was a 13% reduction in the number of people who intended to drive their car to work and an increase in the proportion of people who were planning on driving to work less in the next month and who had already taken action to drive to work less ($p = 0.039$, marginal homogeneity test).

Mode of transport on normal working days and Sundays

There was an increase from 37% to 45% of staff reporting use of active transport as their usual mode of transport to work, but this difference was not statistically significant. However, there was a significant reduction (20%) in the proportion of staff who reported driving to work 5 days per week (Table 7).

Table 7 shows the distributions of the number of trips travelled by car on normal working days and Sundays between the pre- and

Table 4: Awareness of the social marketing campaign message and material

	Pre-intervention (%)	Post-intervention (%)	*p*-value[a]
Campaign recall			
Unprompted	9.8	49.0	0.015
Prompted	17.6	94.1	0.00
Awareness of the term 'active transport'	27.5	70.6	0.00
Having seen or used active transport to the QMB map	9.8	56.9	0.00

[a]McNemar's test.

Table 5: Attitudes to active transport

Statements	Percentage agreement ('agree' and 'strongly agree') to the statement items (total $n = 51$)		
	Pre-intervention	Post-intervention	*p*-value[a]
(If you drive) I would like to use my car less often	56.9	70.6	0.016
I believe public transport should be the main form of transport to work	62.7	76.5	0.016
People who drive to work help to destroy the enviroment	74.5	80.4	0.453
If I could, I would definitely cycle to work	39.2	51.0	0.011
If I could, I would definitely walk to work	80.4	92.2	0.031
If I could, I would definitely catch public transport to work	62.7	80.4	0.012

[a]McNemar's test.

Table 6: Stage of change towards car usage to work

'Which of the following best describe how you feel about car usage to work?'	Percentage of car users ($n = 30$[a])	
	Pre-intervention	Post-intervention
I will be driving my car to work in the next 6 months	76.7	63.3
I am planning on driving my car less to work in the next 6 months	10.0	10.0
I am planning on driving my car less to work in the next month	6.7	13.3
I have been driving my car less to work in the last month compared with 6 months ago	6.7	13.3
Total	100.0	100.0

[a]Two missing data. Marginal homogeneity test: $p = 0.039$.

post-intervention surveys. A significant change was found on Sundays ($p < 0.05$, marginal homogeneity test). There was a 10% increase (from 19.6% to 29.4%) in the proportion of staff reporting trips taken without using a car and a 14% reduction in the number of staff who reported taking car trips 'three to four times'. However, this pattern of change was not found on normal working days.

The impact of weather conditions on choice of mode of transport was considered. The mean scores of self-rated weather conditions were not significantly different between pre- and post-intervention surveys for both working days and Sundays (5.6 versus 5.2, and 6.1 versus 5.9, respectively).

DISCUSSION

The results indicate that some positive change resulted from the programme. The decrease in car trips on Sundays and the reduction in the proportion of participants who drove to work

Table 7: Usual mode of transport and car trips on working days and Sundays

	Percentage (n = 51)		p-value
	Pre-intervention	Post-intervention	
Usual mode of transport to work			
By means of active transport[a]	37.3	45.1	0.125[c]
By car[b]	62.7	54.9	
Number of times driving to work per week			
Five times	82.3	62.5	0.012[c]
Less than five times	17.7	37.5	
Trips[d] travelled by car on working days			
0	35.3	33.3	0.414[e]
1–2	23.5	27.5	
3–4	33.3	35.3	
> 4	7.8	3.9	
Trips[d] travelled by car on Sundays			
0	19.6	29.4	0.001[e]
1–2	39.2	43.1	
3–4	33.3	19.6	
> 4	7.8	7.8	

[a]Including walking, cycling, or travelling by train or bus.
[b]Including as a driver or passenger.
[c]McNemar's test.
[d]A trip is defined as estimated travel distance of 500 m or further.
[e]Marginal homogeneity test.

5 days per week found in the post-intervention survey suggests that the intervention was effective to some extent at increasing the use of active transport and at decreasing current car use. With less car use, we would expect to see an increase in physical activity levels, as even public transport users have to walk to and from transport stops. The improvements in attitude, knowledge and stage of change also suggest that the intervention was effective in changing some of the factors that may influence travel behaviour.

Although the change in knowledge and attitude we observed in our study was small, a change of such magnitude if it were replicated across the whole population would result in a substantial reduction in overall car use. Where reductions in car use were replaced by active transport it could also make a major contribution to health. Evaluation of promoting active transport should not be disappointing as a result of achieving small changes.

The intervention had a strong effect on transport on Sundays, suggesting that the journey to work may be quite resistant to change. This finding is in accordance with that of other authors who have investigated the same journey (Kingham *et al*., 2001). Commuters perceive that they have less flexibility with respect to how and when they can take the trip, and how long it should take. More substantial infrastructure changes that deter car use through increased financial cost and decreased convenience of parking are required; however, this must be done in conjunction with improvement in the option of public transport and other travel modes. The change we saw also indicates that the messages heard at work could be translated into action outside of the workplace. Thus it may be appropriate to target the broader population through workplaces.

Some caution is necessary when interpreting the results of the intervention. This was a pilot study that was conducted in a workplace for health employees. The employees were possibly more aware of health issues than the population in general and therefore may have been more inclined to take up health promotion messages. Our sample included a greater proportion of women than the general population and this may have had a bearing on the results. Further, there has been no systematic study of active transport across the population therefore we cannot determine whether the results with this group of study participants are typical. In addition, this study did not have a control group.

The intervention comprised two strategies, therefore it is impossible to determine which was most influential in promoting change, and thus this evaluation is of the strategies combined rather than of individual components. Nonetheless, this combined strategy is a closer representation of individualized marketing campaigns as they exist in the real world as these interventions would almost inevitably include a social marketing component.

The changes in travel mode may be due to the workplace having good access to public transport. Promoting active transport requires that the infrastructure be available for people to take up the message. There is little point encouraging the use of public transport if it is unreliable, slow or expensive. This will differ from site to site; however, in CBD areas, where public transport is usually concentrated, the promotion of active transport may be more effective. Following the encouraging findings of this study we intend to conduct a larger study with multiple sites so as to determine the efficacy of the intervention and to measure its effect across a range of settings.

In summary, our findings suggest that a combined social and individualized marketing campaign in a central urban workplace can increase the use of active transport. However, we are reluctant to state that this intervention was solely responsible for the changes that we observed, as we did not include a control group. We therefore caution that before these findings are acted upon and become the basis of an active transport programme, the intervention should be tested in a controlled study. Nonetheless, our study does suggest that the workplace is an appropriate setting for increasing the use of active transport.

ACKNOWLEDGEMENTS

This study would not have been possible without the help and cooperation of the study participants, all of whom were CSAHS employees working at the QMB.

Address for correspondence:
Dr Li Ming Wen
Senior Research and Evaluation Officer
Health Promotion Unit
Central Sydney Area Health Service
Level 9 North, King George V Building
Missenden Road Camperdown NSW 2050
Australia
E-mail: lmwen@email.cs.nsw.gov.au

REFERENCES

Baudains, C., Stylesn, M. I. and Dongle, P. (2001) Travelsmart workplace: walking in the journey to work. In *Australia: Walking the 21st Century*. Perth, Western Australia, pp. 109–117.

Booth, M., Bauman, A., Owen, N. and Gore, C. (1997) Physical activity preferences, preferred sources of assistance, and perceived barriers to increased activity among physically inactive Australians. *Preventive Medicine*, **26**, 131–137.

CDHAC (2001) Evaluation summary: National Walk to Work Day—Friday November 3, 2000. CDHAC, Australia.

Dunn, A., Andersen, R. and Jakicic, J. (1998) Lifestyle physical activity interventions: history, short- and long-term effects and recommendations. *American Journal of Preventive Medicine*, **15**, 398–412.

Kingham, S., Dickinson, J. and Copsey, S. (2001) Travelling to work: will people move out of their cars. *Transport Policy*, **8**, 151–160.

Lefebvre, R. C. and Flora, J. A. (1988) Social marketing and public health intervention. *Health Education Quarterly*, **15**, 299–315.

Mason, C. (2000) Healthy people, places and transport. *Health Promotion Journal of Australia*, **10**, 190–196.

Moher, M., Hey, K. and Lancaster, T. (2004) Workplace interventions for smoking cessation. *Cochrane Database of Systematic Reviews*.

Mutrie, N., Carney, C., Blamey, A., Crawford, T. and Whitelaw, A. (2002) 'Walk in to Work Out': a randomised controlled trial of a self help intervention to promote active commuting. *Journal of Epidemiology and Community Health*, **56**, 407.

Napolitano, M. and Marcus, B. (2002) Targeting and tailoring physical activity information using print and information technologies. *Exercise and Sport Sciences Reviews*, **30**, 122–128.

Oja, P., Vuori, I. and Paronen, O. (1998) Daily walking and cycling to work: their utility as health-enhancing physical activity. *Patient Education and Counselling*, **33**, S87–S94.

Prentice, A. and Jebb, S. (1995) Obesity in Britain: gluttony or sloth. *British Medical Journal*, **311**, 437.

Rose, G. and Ampt, E. (2001) Travel blending: an Australian travel awareness initiative. *Transportation Research Part D*, **6**, 95–110.

Rose, G. A. (1992) *The Strategy of Preventive Medicine*. Oxford University Press, Oxford.

Sherwood, N. and Jeffery, R. (2000) The behavioral determinants of exercise: implications for physical activity interventions. *Annual Review of Nut*, **20**, 21–44.

SigPah and National Public Health Partnership (2001) *Promoting Active Transport—an Intervention Portfolio to Increase Physical Activity as a Means of Transport*. National Public Health Partnership, Melbourne.

Sowden, A. J. and Arblaster, L. (2004) Mass media interventions for preventing smoking in young people. *Cochrane Database of Systematic Reviews*.

Stephenson, J., Bauman, A., Armstrong, T., Smith, B. and Bellew, B. (2000) *The Cost of Illness Attributable to Physical Inactivity in Australia—a Preliminary Study*. CDHAC, Canberra.

Transport WA (1999) *Travelsmart (2010): A 10-year Plan*. Transport, Travel Demand Management, Perth.

US Department of Health and Human Services (1996) *Physical Activity and Health: A Report of the Surgeon General*. US Department of Health and Human Services, Centre for Disease Control and Prevention, National Centres for Disease Prevention and Health Promotion, Atlanta, GA.

WHO Regional Office for Europe (1999) *Charter on Transport, Environment and Health*. Third Ministerial Conference on Environment and Health.

WHO Regional Office for Europe (2002) *A Physically Active Life Through Everyday Transport*. Adrian Davis Associates (ed.), Bristol, UK.