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Physical activity by stealth? The potential health benefits of a workplace transport plan

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SUMMARY

Objectives: There are few published evaluations of the effects of travel policy on health-enhancing physical activity. The purpose of this study was to investigate the effect of a workplace travel plan, which mainly focused on restricting parking opportunities, on levels of active commuting and its potential to contribute to public health.
Study design: Analysis of a repeated bi-annual travel survey in a workplace setting.
Methods: Usual mode of commuting, gender, age, worksite location and distance commuted to and from work were obtained from the University of Bristol Staff Travel Surveys conducted in 1998 ($n = 2292$), 2001 ($n = 2332$), 2003 ($n = 1950$), 2005 ($n = 2647$) and 2007 ($n = 2829$). Z-tests were used to examine the significance of trends in active commuting between 1998 and 2007. The largest and most recent survey (2007) was used to calculate the effects of gender, age and salary band on mode of transport, length of commuter journey, and the extent to which active commuting contributed to meeting national recommendations for physical activity.
Results: Results showed that between 1998 and 2007, in contrast to national trends, the percentage of respondents who reported that they usually walked to work increased from 19.0% to 30.0% ($Z = 4.24$, $P < 0.001$). The percentage of regular cyclists increased from 7.0% to 11.8%, but this was not statistically significant. In 2007, regular walkers were more likely to be female, under 35 years of age and earning a middle-band salary. Regular cyclists were more likely to be male, aged 36–45 years and earning a higher-band salary. Approximately 70% of respondents who usually walked or cycled to work achieved greater than 80% of the recommended guidelines for physical activity through their active commuting.
Conclusions: This study suggests that transport plans aimed at reducing car usage should be considered as a feasible and effective strategy for increasing health-enhancing physical activity among the workforce.

Introduction

Promoting participation in regular, moderate-intensity physical activity is a public health priority in the UK[1] and Europe.[2] Physical activity reduces the risk of morbidity and mortality from cardiovascular disease, diabetes and some cancers, and assists in the maintenance of a healthy weight.[3,4] Additionally, regular physical activity can reduce the risk of depression and dementia, and has positive benefits for mental well-being.[4] Government guidelines state that adults need to accumulate

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at least 30 min of moderate-intensity physical activity on at least 5 days/week, representing a total of 150 min/week.[3] Daily amounts can be achieved with similar positive effects through either a single 30-min session or several shorter bouts of activity of 10 min or more. However, a large proportion of the UK population does not meet these recommendations. The 2008 Health Survey of England[5] indicated through self-report that only 39% of adult men and 29% of women met weekly recommended levels of physical activity. Clearly, feasible and effective strategies for increasing levels of activity are required if public health benefits are to be realised.

Health policy makers are engaged in several options aimed at motivating people to become more active. These include support through general practitioner referral for exercise schemes, a new physical activity care pathway ('Let's Get Moving') and by increasing access to leisure opportunities such as free swimming, many of which are already part of English national policy.[1,6] However, there is concern that such schemes are more successful in attracting health-conscious, better-educated sectors, and overall these may increase health inequalities. A challenge remains to find acceptable modes of activity that can be incorporated into people's everyday lives,[7] and that also appeal to people from health-needy backgrounds. An alternative to physical activity as leisure, where barriers such as lack of motivation, cost and time constraints are often reported, is to promote naturally occurring activity such as walking and cycling as modes of daily travel.[8]

The World Health Organisation Charter on Transport, Environment and Health[8] reported that the average walking journey in Europe is approximately 1.5 km, and the average cycling trip is 3.5 km, each taking approximately 15 min. However, national levels of daily walking have decreased steadily as car usage has increased.[9] Walking and cycling to and from work may therefore have the potential to increase health-enhancing physical activity, especially if reduced usage of the car can be incentivised.[10] At the same time, reductions in car usage would help cut emissions, reduce congestion and stimulate improvements in public transport provision.[9] Therefore, an alternative approach to increasing opportunities for activity is to make car use more difficult.

Such an opportunity has arisen at the University of Bristol where, in 1999, a transport plan (www.bristol.ac.uk/transportplan/plan/theplan.html) was launched to ease congestion and onsite parking problems, and release parking spaces for building. Improved health or increased physical activity were not objectives of the Bristol University Transport Plan. The purpose of this study is therefore to assess the collateral impact of a transport plan that focused on reduced car usage on employee levels of walking and cycling to work. Transport plans have rarely been evaluated in terms of their health impact.[11] A particular objective, therefore, was to attempt to estimate the potential of active travel to contribute to recommended amounts of activity for health.

Methods

Setting and strategy

The main precinct of the University of Bristol is located on an elevated site within 1 mile of the city centre, so space for building development is very limited and land prices are at a premium. Strategies of its Transport Plan featured both 'carrot' and 'stick' measures, including heavily limiting parking spaces and conditions for permits, increased parking charges, improving changing facilities for walkers and cyclists, new secure cycle storage, a subsidised cycle purchase scheme, a car-sharing scheme, a free university bus service which served local train and bus stations, and discounted season tickets on buses. Changes to the parking and permit conditions and charges were implemented in August 2000, 12 months after the plan's publication, in order to allow employees sufficient time to explore alternative methods of travelling to work. In 2001, Bristol City Council also reduced the availability of non-resident parking in areas surrounding the University. From the outset, improving health or increasing physical activity were not objectives of the plan, and were only mentioned tangentially in documentation.

The University of Bristol Staff Travel Survey

The survey is a self-administered questionnaire. It was posted to every member of staff in November 1998 and 2001, and was e-mailed for completion online in November 2003, 2005 and 2007. The 1998 survey data provided a pre-campaign assessment, and were compared with a University of Bristol travel survey carried out in 1993 and a Bristol City Council survey undertaken in 1997. This comparison indicated a similar split in employees' usual mode of transport to work across all three surveys.[12] The survey assesses employees' location of work in the university, their residential postcode, commuting habits, car parking arrangements and motives for reducing car usage. The 2005 version added gender and salary questions, and the 2007 version also added age.

The study sample was employees completing the Bristol Travel Survey. Sample sizes (with % response) were as follows: 1998, $n = 2292$ (54.4%); 2001, $n = 2332$ (45.4%); 2003, $n = 1950$ (37.5%); 2005, $n = 2647$ (49.9%); and 2007, $n = 2829$ (49.2%). The number of respondents who completed the survey for more than 1 year is not known as it is not possible to match responses.

Study variables

The main survey variable selected for trend analysis was employees' usual mode of transport to work. In order to characterise active commuters, the 2007 data were used to determine associations between demographic factors and mode of travel to work, and the contribution of active travel to government-recommended levels for health. Table 1 provides a comparison between the key demographic characteristics of the 2007 sample with those of the full staff population of the University of Bristol in 2007.

Mode of transport

Each survey included the question 'How do you travel to work?', categorised into 'usually' (four to five times per week), 'sometimes' (two to three times per week) and 'occasionally' (once or less per week). For this paper, responses were grouped into 'walk', 'cycle', 'car user' and 'other' categories. 'Car user' represented pooled data for car driver (on own), car driver (at least one passenger), car passenger and car sharer (formally