Effect of increasing active travel in urban England and Wales on costs to the National Health Service

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
This study sought to estimate the potential health and cost benefits of increasing active urban travel (mainly walking and cycling), in the UK. The authors concluded that, even if only half as effective as expected, this could reduce NHS costs, releasing funds for other health care. No policy initiatives were evaluated; the benefits of assumed changes in travel behaviour were assessed. Given the study objective, the methods and reporting were adequate, and the conclusions were appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
This study sought to estimate the potential health and cost benefits of increasing active urban travel, reducing passive travel by motor vehicle, in the UK.

Interventions
The effects, on seven diseases, of average daily increases in distances travelled by walking, cycling, motorbike, car, bus, and rail were assessed.

Location/setting
UK/public health.

Methods
Analytical approach:
The authors adapted a model produced by Woodcock and colleagues (see Other Publications of Related Interest) to produce incident disease rates, rather than years with disability. They stated that they took a UK NHS perspective. The time horizon was 2011 to 2030 (20 years).

Effectiveness data:
The primary clinical data were the exercise-related relative risk reductions in the incidence of seven diseases: type 2 diabetes, dementia, cerebrovascular disease, breast cancer, colorectal cancer, depression, and ischaemic heart disease. These relative risk reductions were from Woodcock and colleagues, while the incidence data were from published sources. The risk reductions were identified by a systematic review, which was described. The full effectiveness of the intervention, in reducing the incidence of the diseases, was delayed by incorporating disease-specific lag factors, based on a sigmoid-lag relation. The Visioning and Backcasting for Transport (VIBAT) London study supplied the reasonable potential active travel distances.

Monetary benefit and utility valuations:
Not applicable.

Measure of benefit:
The measure of benefit was cost savings as a result of reduced treatment for type 2 diabetes, dementia, ischaemic heart disease cerebrovascular disease, breast cancer, colorectal cancer, depression, and road traffic injuries.
Cost data:
The cost data were identified by searches in PubMed and disease-specific reports, using the terms 'costs' and the names of the diseases. Costs had to be gathered between 2001 and 2011, from a representative sample of patients, for the treatment of the seven diseases, in the first year from diagnosis, and in subsequent years. The duration of a disease varied, based on the expected time in which costs were incurred. The cost of road traffic injuries was from the UK NHS costing template for head injuries, and the Personal Social Services Research Unit. Treatment costs were adjusted to 2010 UK £, using the UK consumer price index for health care.

Analysis of uncertainty:
Monte Carlo simulation was used to generate 95% confidence intervals around the model parameters, using log-normal distributions for the costs. An alternative shorter distance walking scenario was investigated (half the initial distance); a linear lag relation was used instead of a sigmoid relation; and an analysis assumed that it took 20 years to reach the full health benefits after intervention. The disease duration was halved and doubled; an analysis included the social care costs for dementia; and another analysis assumed the benefits took 20 years for full realisation, with half the disease duration and the active travel effects on the number of cases prevented. An analysis was conducted with a 3.5% annual discount rate for costs, and 2.9% inflation.

Results
The model estimated that the NHS could save £17 billion, over 20 years, by averting incident cases of disease. Discounting resulted in lower savings. All sensitivity analyses were conducted for the initial and the shorter walking distances; in all cases the shorter scenario resulted in lower savings than the initial distance.

Changing the lag function to linear, resulted in £27 billion savings. Adding social care costs for dementia, making benefits take 20 years for full realisation, and halving the disease duration, all had modest effects. Halving the cases prevented, reduced the savings.

The most conservative scenario, making all health outcomes take 20 years for full realisation, and halving disease duration and cases prevented, reduced the savings to £6 billion, over 20 years.

Authors' conclusions
The authors concluded that increasing walking and cycling in urban settings, even if only half as effective as expected, could reduce NHS costs, releasing these funds for other health care.

CRD commentary
Interventions:
No specific interventions were evaluated; the study evaluated the benefits of assumed changes in travel behaviour.

Effectiveness/benefits:
The effectiveness data were well reported. They were from published studies that were described. Most of the data were from Woodcock and colleagues, who reported a systematic review of the effectiveness of additional active travel. No intervention was analysed, and it is unclear if any intervention could increase activity to produce the relative risk reductions in diseases. There could be confounding factors between the people who respond to any intervention and their risk of disease. The benefits were measured by the savings in caring for new cases of incident disease. The authors acknowledged that this did not fully capture the health benefits; other studies have assigned a monetary value to improvements in health with activity.

Costs:
As the study evaluated the benefits of an assumed change in behaviour, no costs of an intervention were included. A systematic review was used to identify the disease cost data. Details of the search were reported, but how the studies were selected for inclusion, and their details, were not given. The inclusion criteria were vague. It was unclear if the cost estimates were selected results or the range of results identified.

Analysis and results:
Discounting was not conducted as any costs saved would be immediately reinvested. In a cost-effectiveness analysis the costs and benefits should be discounted, if they occur in the future. Discounting was included in a sensitivity analysis.
The analysis was adequately described and the results were reported. The authors were thorough in their evaluation of the limitations of their study and its generalisability. They acknowledged that: their study did not value changes in obesity incidence, nor potential health benefits beyond cases of disease averted; and increasing physical activity would be hard to accomplish. The authors reached appropriate conclusions, based on their results, and they accounted for limitations.

**Concluding remarks:**
The study did not set out to evaluate the costs and benefits of alternative policy initiatives to encourage more active travel. Instead, it evaluated the benefits of assumed changes in travel behaviour. Given the objectives, the methods and reporting were adequate, and the conclusions were appropriate.

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