



Cycling for Better Health

Introduction and Objectives

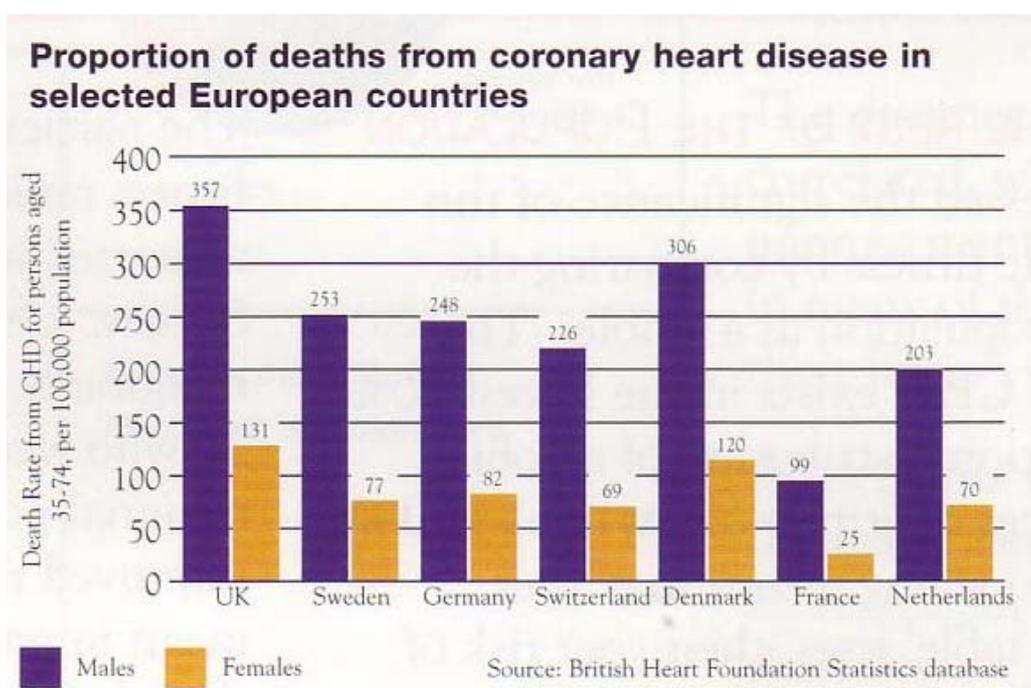
This leaflet summarises the results from a cycling and health experiment carried out by Allott & Lomax and the Policy Studies Institute. It was part of a wider Transport Research Laboratory (TRL) study for the Department of the Environment, Transport and the Regions (DETR). Changes in fitness and attitudes were studied in people of working age who had begun to cycle regularly, but who had previously taken little or no exercise. The effects that were observed should be of interest to professionals working in the area of health promotion. They are also potentially valuable to anyone planning travel awareness programmes (such as Travelwise), Green Transport Plans, and schemes to promote more cycling as a convenient and environmentally friendly form of transport. The results are described fully in TRL Report 346 'Cycling for a Healthier Nation'.

The experiment aimed to find out:

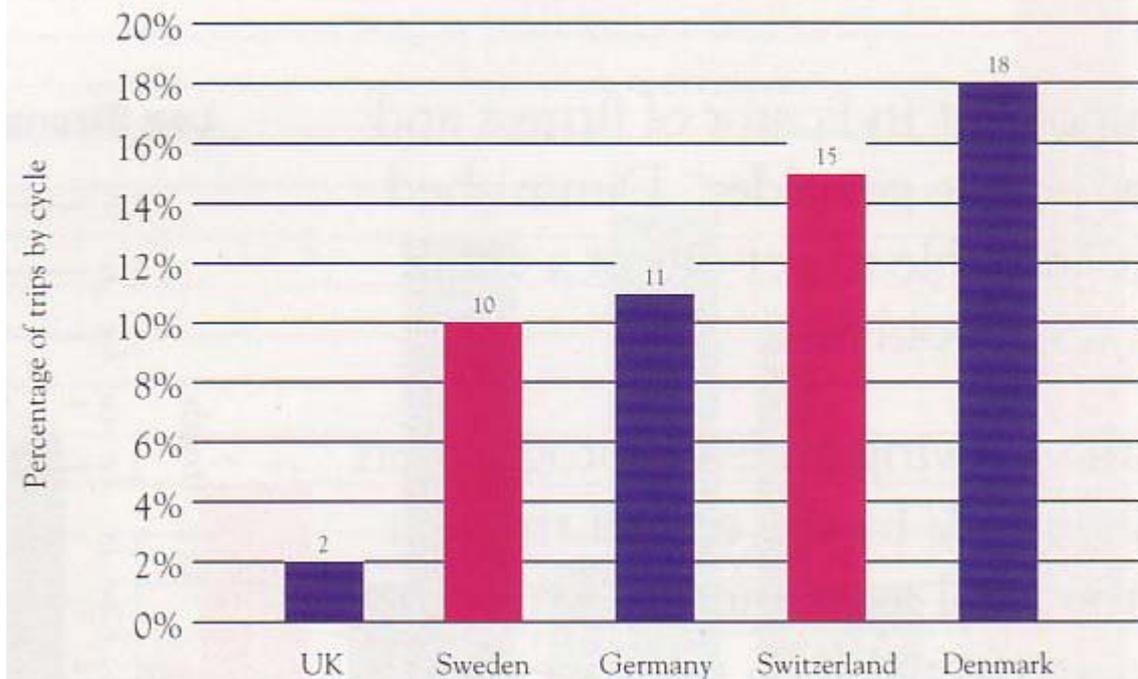
- Whether regular cycling makes people healthier, to what extent and in what way?
- If so, how much cycling would be needed to improve the health of someone who currently takes little or no regular exercise?
- What practical difficulties are there in persuading non-exercisers to take up and continue cycling?

Physical Exercise and Health

The link between regular exercise and good health has been well established in many research studies throughout the world. People living in affluent countries who maintain a sedentary lifestyle have been shown to be more at risk from diseases such as coronary heart disease (CHD), strokes, obesity, cancer of the colon, depression and diabetes.



Proportion of journeys made by bicycle in selected European countries



The National Fitness Survey, published in 1992, found that the majority of the UK population does not take sufficient exercise to ensure good health. Britain has a higher incidence of CHD than most other countries.

A common way in which people in some other countries take more exercise than we do is by cycling, both as a means of everyday transport and as a leisure activity. In the Netherlands almost 30% of all journeys are by bicycle, compared with less than 2% in the U.K.

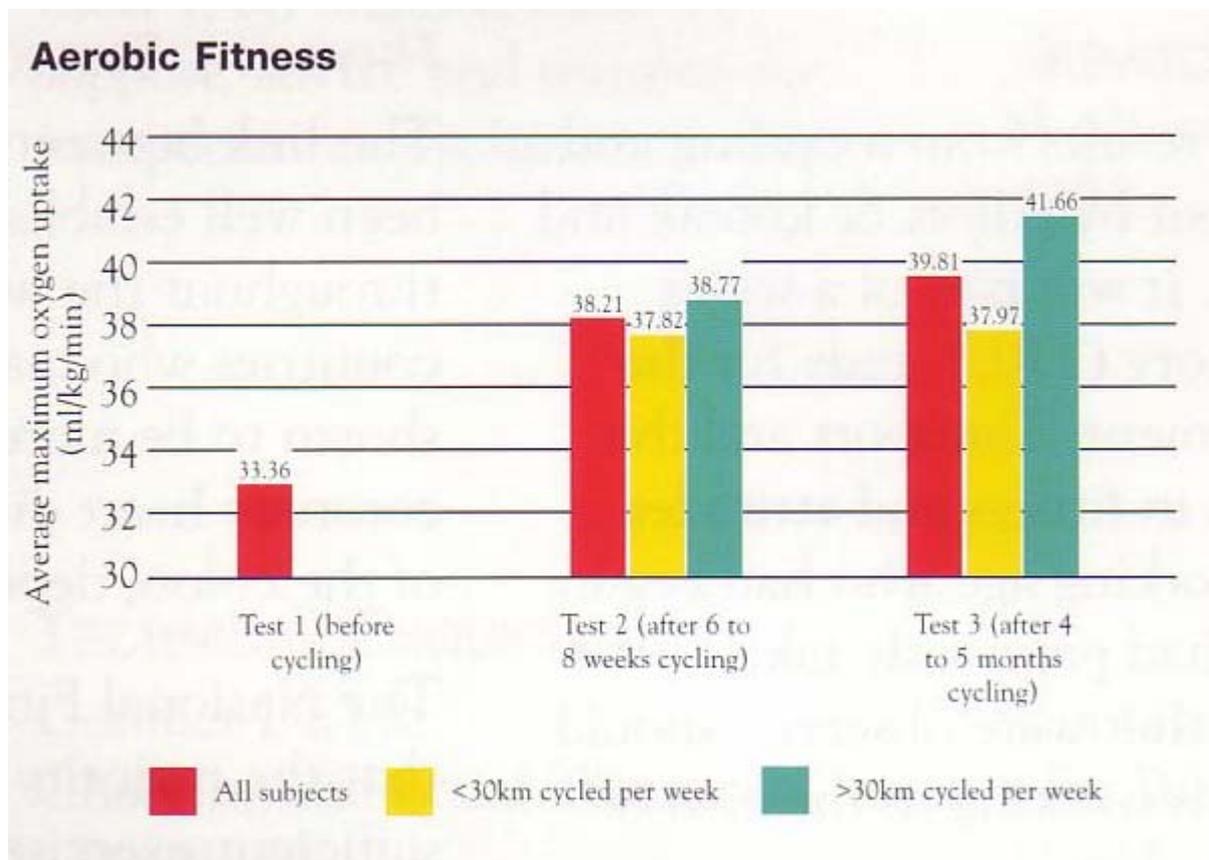
Methodology

Ninety-one volunteers, (non-exercisers willing to commit to cycling a short distance at least four times a week) were recruited in Liverpool, Manchester and Birmingham. They were given initial fitness assessments and completed a detailed questionnaire on their present attitudes and health. Of these, 70 continued to a re-examination after approximately six weeks of cycling, and 40 were given a third test and questionnaire after completing a four to five month period of cycling.

Aerobic Fitness

The most important aspect of health-related fitness - aerobic fitness - improved in nearly all of those who completed at least part of the study. Aerobic fitness is the capacity to maintain vigorous exercise without becoming exhausted. It was assessed on an instrumented bicycle by recording the changes in heart rate with a progressively increasing load. The mean improvement in the capacity to take in oxygen while exercising was over 11% at the first re-examination, and by those completing the whole trial the improvement was almost 13%. The greater part of the improvement in aerobic fitness occurred during the first six to eight weeks of the trial, reflecting the change from a sedentary to a regularly active lifestyle.

A clear 'dose - response' effect was evident: the more the volunteers cycled, the fitter they became. Those volunteers who cycled 30 km or more per week (the median distance overall) increased their aerobic fitness, on average, by over twice as much as those cycling less per week (17% compared with 8%). If achieved in four or five weekly half-hour cycling sessions, 30 km per week corresponds very closely to the Health Education Authority's recommendations for health-enhancing exercise.



Nevertheless, those cycling less still made significant gains in their aerobic fitness. This implies that even a small amount of regular cycling is directly beneficial.

Comparison with the rest of the Population

The research team assessed the significance of this improvement in aerobic fitness by comparing the participants with the population as a whole. The greatest relative risk of CHD exists in the lowest 20% of the national population distribution of aerobic fitness. This risk reduces continuously as one's ranking improves. If taking up cycling means that your position in the 'league table' rises, then your risk of developing CHD or other fitness-related illness is reduced.

The participants were classified according to their fitness ranking compared with the UK population, as measured in a large sample in the National Fitness Survey. Overall, as non-exercisers they were marginally less fit than the national average. Of the 35 who were, at the outset, in the bottom

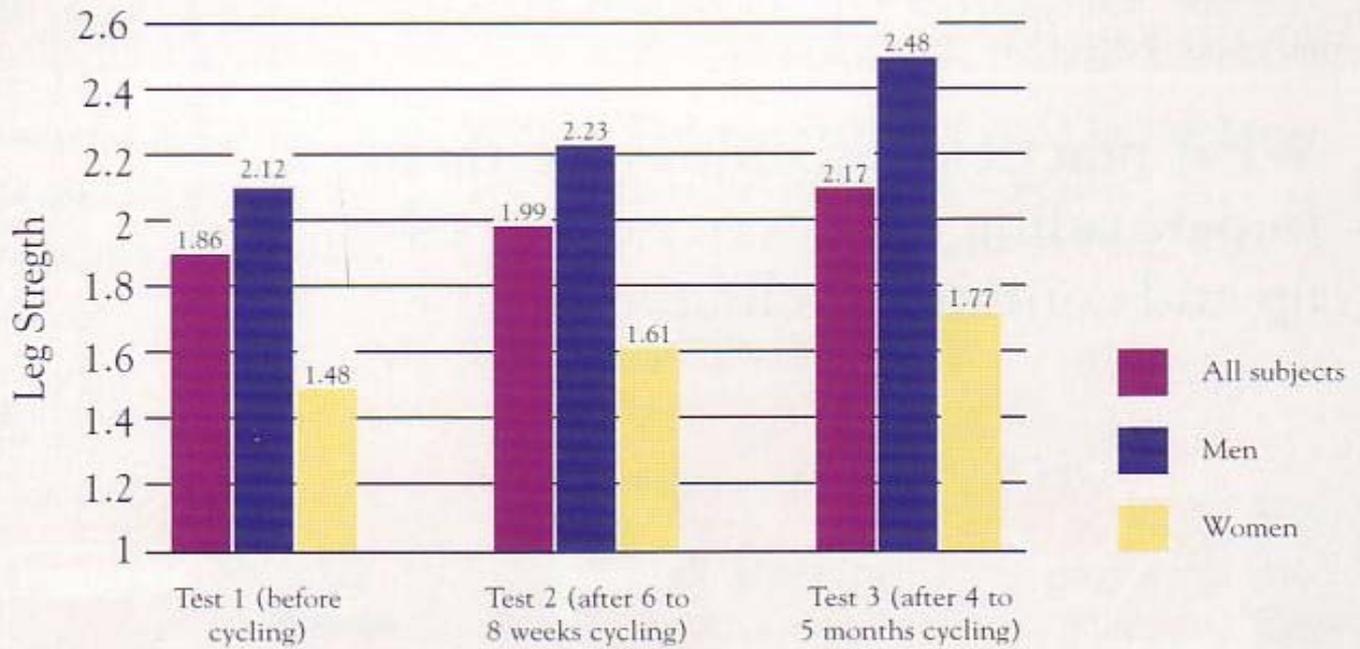
fifth of the national population distribution, all but two had improved their fitness after the first 6 - 8 weeks with a mean improvement of over 13%. Those completing the whole trial moved from the bottom third of the national fitness distribution to a near average position.

Leg Strength

Leg strength is another important indicator of fitness and is particularly important as people get older. Diminished leg strength means you are less able to get out of a chair, move around confidently, and avoid falls.

This also improved overall, showing an even progression over the entire trial, to about 8% by the end of the first 6 - 8 weeks and 16% by the final assessment. An even greater dose-response was apparent, 26% improvement for those cycling above the median distance of 30 km a week, compared with 4.5% for those below.

Leg Strength (weight related)

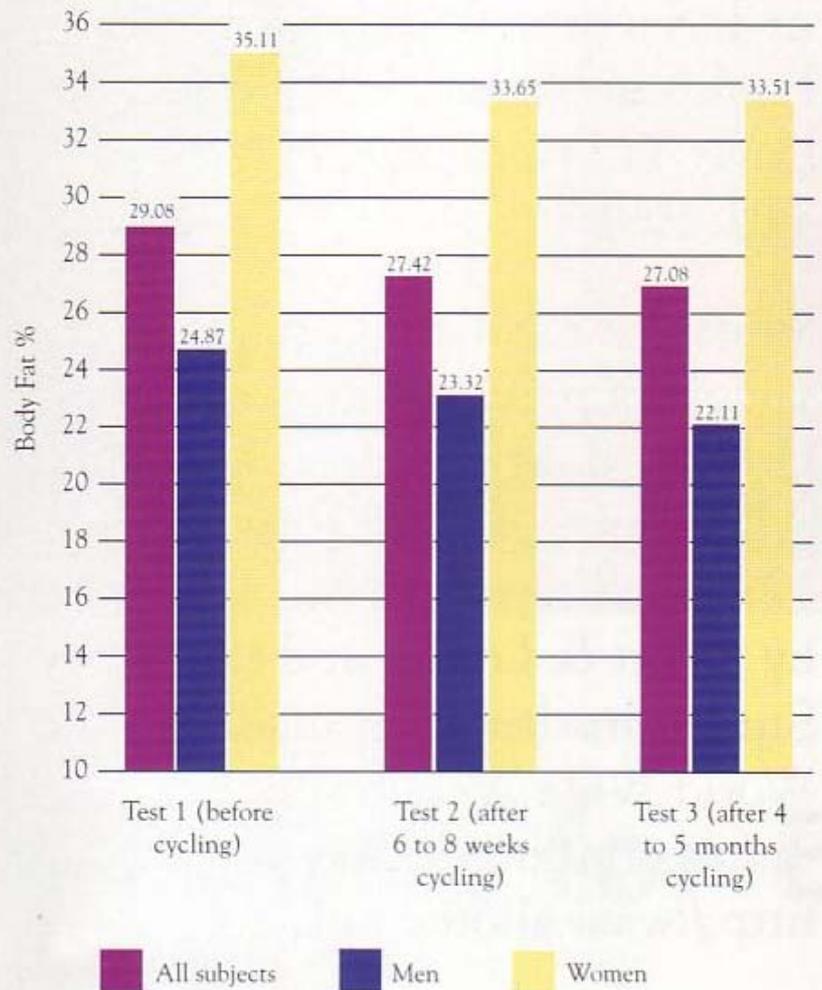


Body Fat

Body fat was significantly reduced among most of those of the participants who were overweight or obese at the outset (59% of the participants). The extent of fat loss, typically two to three kilograms of fat mass over the period of the trial, should mean that they achieved a change in energy balance, making it easier for them control their weight whilst they continued to be active.

Volunteers were asked at the outset why they had joined the experiment. The primary motivation was to 'lose weight', which most people equated with 'getting fit'. However, participants often did not lose any weight because fat was replaced by muscle, which is heavier. Some plainly felt disappointed at lack of progress in this direction, and dropped out of the experiment as a result. Nevertheless, increased activity had made them fitter and therefore healthier. This reinforces the well-known limitations of using the bathroom scales as the sole criterion of fat loss, when there has been a change in physical activity.

Average percentage body fat of volunteers



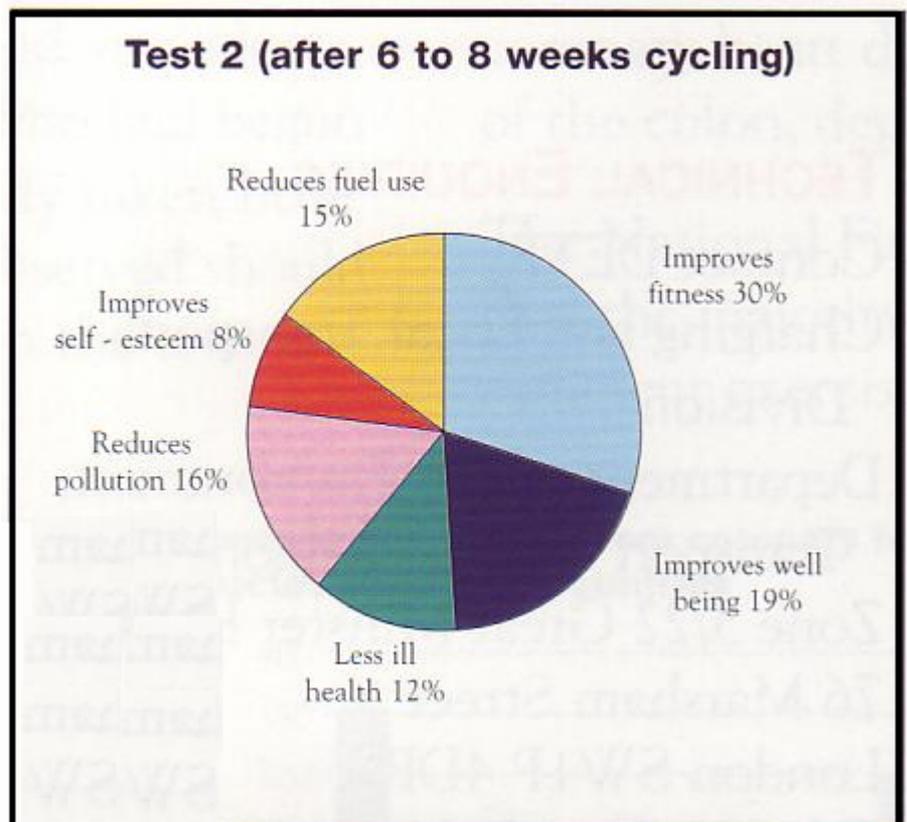
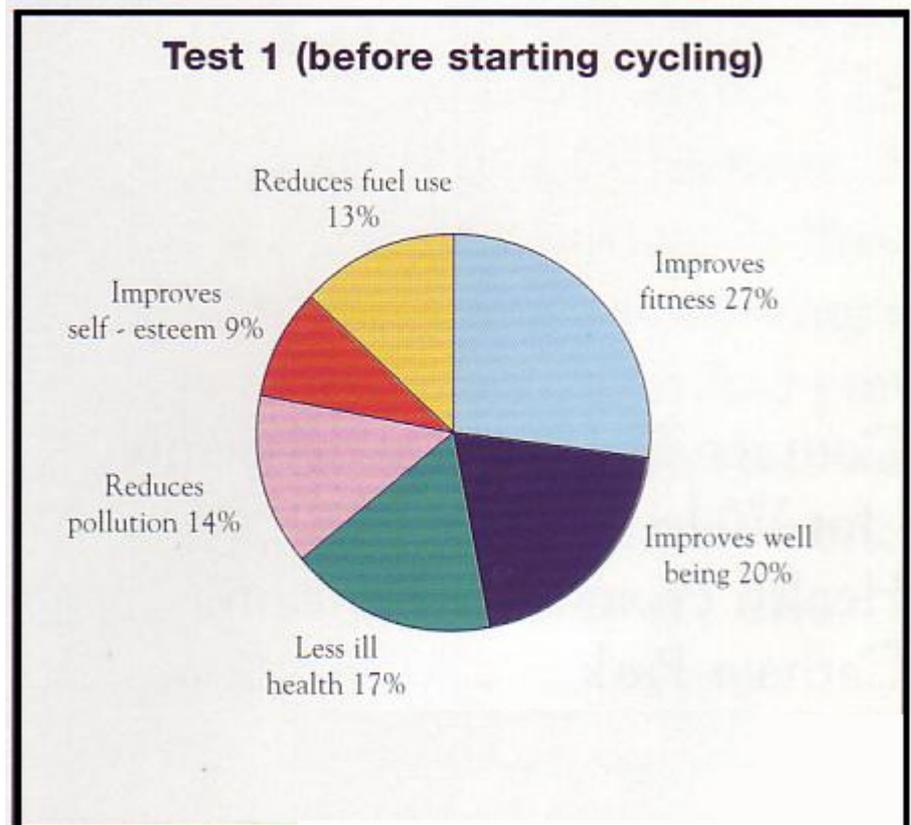
General Health and Well-Being

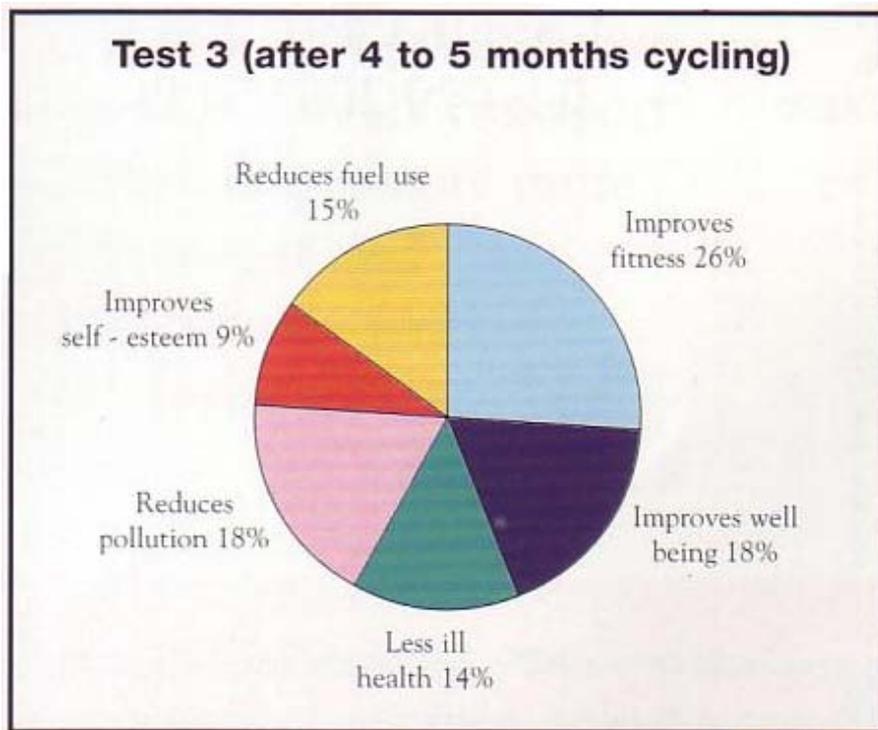
A detailed questionnaire before and after the experiment sought to identify changes to the social and psychological factors which might affect people's responses to cycling encouragement programmes.

Almost all of the volunteers were pleased they had started to cycle. Those who cycled to work were significantly more likely than those who commuted by other modes to consider their journey enjoyable. Approximately 6 out of every 7 respondents said they would continue to cycle in the future.

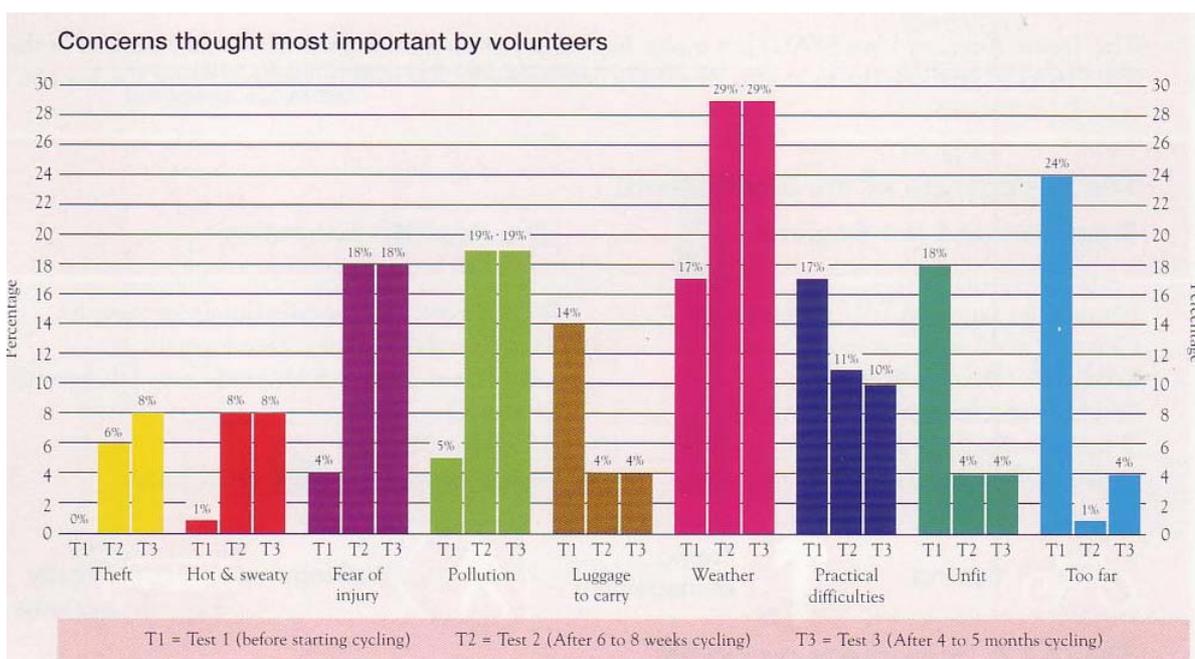
The distance cycled was positively correlated, with a perceived improvement by the respondents in many of the health aspects of their lives.

Participants were asked to judge the major benefits of cycling and at all stages put fitness at the top of their list.





Barriers to continuing Cycling



The participants were also asked to state any concerns they felt about cycling, and which of these concerned them 'a lot'. At the outset, participants were most concerned about the distance being too far, being unfit, and overcoming practical problems. As they became more used to cycling, distance and lack of fitness became less important, while weather, air pollution and fear of injury became more important.

Conclusions

The research findings show that even a small amount of cycling can lead to significant fitness gains. However, from the volunteers who dropped out of the experiment it is clear that this gain is quickly reversed once regular exercise stops. This has implications for any long-term health benefits.

By the end of the experiment the winter weather was beginning to reduce the amount of cycling by the remaining participants. Experienced cyclists know that cold or wet weather need not be a serious obstacle if the right clothing and sensible behaviour are adopted. However, to an inexperienced cyclist they seem more

of a problem. Additionally, motor traffic that is tolerable in daylight becomes more of a perceived threat at night.

Cycling is one of the few physical activities which can be undertaken by the majority of the population as part of a daily routine. There could be significant savings in health care costs if regular, life-long cycling could be actively encouraged. When some of the barriers identified are overcome, cycling can become a realistic preventative measure for CHD and other illnesses that are related to lack of fitness.

The results of this research provide some extra justification for programmes that aim to encourage more active modes of transport and reduce the dependency on motor cars, and to offer a route for building partnerships between local authorities and health agencies. It demonstrates that there is an ongoing need for support, advice and training for inexperienced cyclists.

Technical Enquiries

Contact:

Department for Transport
Walking and Cycling
Zone 3/27 Great Minster House
76 Marsham Street
London SW1P 4DR
Tel: 020 7944 2983

Contact:

The National Assembly for Wales,
Health Promotion Division,
Cathays Park,
Cardiff, CF10 3NQ
Tel: 029 2082 5111

References

TRL Report 346 - Cycling for a Healthier Nation, L M Pearce, A L Davis, H D Crombie, H N Boyd. TRL 1998

'Effects of regular cycling on a sample of previous non-exercisers', H N Boyd, M Hillman, A Nevill, A D Pearce, and W Tuxworth, 1998. Full report of the experiment by Allott & Lomax and the Policy Studies Institute - available on the World Wide Web in the Transportation section of <http://www.allott.co.uk/>

Allied Dunbar National Fitness Survey, Health Education Authority / Sports Council. HEA 1992

Traffic Advisory Leaflets (TAL) are available to download free of charge on the Department for Transport website www.dft.gov.uk

Sign up for a free e-mail alert to receive notification when a new TAL is published by sending an e-mail to tal@dft.gsi.gov.uk with the subject line "subscribe".

To obtain a printed copy of this and/or other TAL's, contact: DfT Publications, PO Box 236, Wetherby, West Yorkshire, LS23 7NB. Telephone 0870 122 6236. Fax 0870 122 6237. E-mail: dft@twoten.press.net

The Department for Transport sponsors a wide range of research into traffic management issues. The results published in TAL's are applicable to England, Wales and Scotland. Attention is drawn to variations in statutory provisions or administrative practices between the countries.

Within England, enquiries should be made to: Traffic Management Division, Department for Transport, 2/07 Great Minster House, 76 Marsham Street, London, SW1P 4DR. Telephone 020 7944 2478. E-mail: tal@dft.gsi.gov.uk