Submission to the NICE Programme Development Group on walking and cycling

Introduction

We have been invited to submit evidence to inform the deliberations of the NICE Programme Development Group on walking and cycling. Our submission is based on our knowledge of the research literature in this area and our own research in the field, specifically (a) our published systematic reviews of the effectiveness of interventions to promote walking, cycling and modal shift from the car to active modes of transport and (b) our published and current quantitative and qualitative research on how travel behaviour is shaped by the wider context in which people make their travel choices. Different aspects of this research portfolio have been funded by the Engineering and Physical Sciences Research Council, the Medical Research Council, the National Institute for Health Research, the National Prevention Research Initiative and the UK Clinical Research Collaboration. A longer account of some of the issues we raise can be found in our submission to the House of Lords Science and Technology Select Committee as part of its recent enquiry on behaviour change.[1]

In keeping with the focus of our research, our submission is mainly concerned with the potential for integrating walking and cycling into people's daily routine as modes of transport rather than on recreational walking and cycling. We recognise that walking and cycling for the purposes of transport and recreation are distinct behaviours, undertaken for different purposes and the reasons for engagement may be very different. Similarly, while walking and cycling for transport are sometimes considered together (e.g. as 'active travel'), it is increasingly recognised that these may appeal to different sections of the population, be influenced by different determinants and require different intervention strategies. In the UK, walking is a more prevalent behaviour than cycling and it has been argued that it may be a more achievable target for intervention than cycling, particularly among non-cyclists and more sedentary people. On the other hand, cycling may be more likely to raise the heart rate sufficiently to improve cardiorespiratory fitness, and the fact that it is very much more prevalent in some contexts (including certain cities in the UK) than others illustrates the considerable potential for growth in cycling.

Evidence for the effectiveness of interventions

Evidence from systematic reviews

In a series of systematic reviews published between 2004 and 2010 we found some evidence that walking and cycling can be promoted through interventions.[2-5] We understand that the Programme Development Group will have additional and more up-to-date evidence reviews at its disposal now. In the case of walking, we found that interventions tailored to people's needs, targeted at the most sedentary or at those most motivated to change, and delivered either at the level of the individual (brief advice, supported use of pedometers, telecommunications) or household (individualised marketing) or through groups could encourage people to walk more, although the sustainability, generalisability, and clinical benefits of many of these approaches were uncertain.[4] On average and among targeted participants, the most successful interventions could increase walking in general by up to 30-60 minutes per week and walking for transport by up to 15-30 minutes per week, at least in the short term. In the case of cycling, we found that community-wide promotional activities and improving infrastructure for cycling had the potential to increase cycling by modest amounts, but further controlled evaluative studies incorporating more precise measures were required, particularly in areas without an established cycling culture. Studies of individualised marketing reported consistent positive effects of interventions on cycling behaviour, but we noted that these findings should be confirmed using more robust study designs.

Effect sizes

Some interventions are designed to promote walking, others to promote cycling, and others to promote physical activity in general or to promote an overall shift in travel behaviour (e.g. a shift from car use to all other modes of transport). Our systematic reviews found more controlled studies of interventions with walking outcome measures than with cycling outcome measures.[4, 5] Different evaluative studies have examined the impact of different interventions using different outcome measures such as changes in the daily or weekly time spent walking or cycling, changes in the usual or main mode of travel to work, or changes in mode share (e.g. the proportion of all journeys made by walking or cycling). This makes it difficult to make direct comparisons of effectiveness between different specific interventions, different classes of intervention (e.g. individual versus community level, or information versus infrastructure) or different outcomes (e.g. walking versus cycling). For example, if an intervention results in a decrease in car use, the proportion of all journeys made by bicycle (mode share) is likely to rise, even if the absolute quantity of cycling remains stable or even falls slightly.[5] Even where interventions are reported to have resulted in impressive relative (percentage) increases in cycling, many studies of this kind have not reported statistical tests of the significance of any reported net increases in cycling, and the absolute increases in the target behaviours (e.g. expressed in terms of the increase in time spent cycling per day) have often been modest.[5]

Evaluative bias

We have repeatedly drawn attention to an evaluative bias in the published literature in this field whereby certain types of intervention (typically those that depend on the direct engagement of motivated individuals or households in an intervention) are more likely to have been evaluated than others.[2, 3, 5] It does not necessarily follow that other approaches (e.g. those involving changes to legislation, infrastructure or other contextual influences on behaviour) are less effective. A considerable amount of effort is currently being applied to redressing this evaluative bias, not least in response to the research recommendations of previous NICE guidance.[6] Our systematic reviews and previous NICE guidance have also drawn attention to significant methodological limitations in the extant evaluative literature on interventions to promote walking and cycling for transport. This field is dominated by studies of the individualised marketing of 'environmentally friendly' modes of transport to interested households, which can serve as an example in this regard. Evaluation reports consistently report evidence of reductions in car use and increases in walking and, to a lesser extent, cycling. However, the validity of the findings of these studies has been questioned.[7] First, these studies have often been conducted and reported by organisations involved in the delivery of the intervention, an arrangement which has the potential to introduce bias.[8] Second, the comparability of the control areas or the method of adjusting for changes observed in the control groups is not always clear. Third, these studies have rarely been subjected to peer review in the scientific literature.

Distributional effects

A further important limitation of the extant evidence concerns the distribution of intervention effects in the population. Our systematic reviews have generally been unable to reach firm conclusions about whether increases in aggregate levels of walking or cycling for transport attributed to interventions reflect, for example, existing cyclists making more trips or non-cyclists taking up cycling.[2, 4, 5] This lack of evidence is important for public health because, all other things being equal, the greatest health benefit is likely to accrue from interventions that are effective in promoting walking or cycling among more deprived groups and more sedentary groups in the

population. Experience in other areas of health promotion raises the possibility that interventions requiring individual motivation and engagement may be differentially taken up by the healthier and more affluent.[9] These groups are unlikely to be those to whom the greatest health gain would accrue from an increase in walking or cycling. This observation underlines the importance of adopting a genuinely population-based public health perspective on potential strategies to promote walking and cycling.

Contextual influences on walking and cycling

It is increasingly recognised that much behaviour is automatic, triggered outside of conscious awareness and cued by influences in the social, physical and economic environments.[10] Walking and cycling behaviour is shaped by a variety of such influences, and people's capacity to respond to interventions targeting such factors as attitudes and awareness is likely to be enhanced or constrained by aspects of this wider context over which they may have no direct control. Much of this wider context does, however, lie within the sphere of influence of local authorities, which are first on the list of organisational audiences for this NICE guidance. In addition to existing research in this area,[11, 12] our work has shown the importance of distance (and time) and the cost, convenience and reliability of alternative modes of transport in influencing travel choices. While this evidence is not derived from studies of interventions, it does identify issues that should be taken into account in making recommendations for future interventions.

Distance

Time is a function of the distance required to travel, and review-level evidence suggests that the distance between origin and destination often limits the travel choices available to people, particularly the options of walking or cycling.[12, 13] Most studies have considered walking or cycling as the sole mode of transport, for example for travel to work or school. For example, in studies in the East of England we have shown that long distances may represent an absolute barrier to walking and cycling for children,[14] working adults[15] and older adults.[16] This has important implications for decisions made by local authorities, for example regarding the location and catchment areas of schools and the development of new residential areas and employment centres. In contrast, we have also shown that the likelihood of incorporating walking or cycling into a longer commuting journey by car or public transport is not associated with the distance between home and work.[17] Combining modes of transport in this way may be facilitated by park-and-ride provision which enables people to complete their journey on foot or by bicycle despite living long distances from work. Several studies have also examined the quantity of walking involved in public transport journeys.[18-20] Interventions involving public transport or park-and-ride facilities may have particular potential to benefit population groups that are sometimes neglected in strategies to promote active travel, such as commuters living in rural areas.

Parking

Other research has suggested that the provision and accessibility of car parking may have an important influence on travel behaviour. Review-level evidence suggests that charging for car parking is associated with fewer single-occupant car trips[21] and our own research in Cambridge has shown that workplace parking charges are associated with a decreased likelihood of regular car commuting[22] and are particularly strongly associated with an increased likelihood of incorporating walking or cycling into a longer car commuting journey.[17] These findings suggest a further potential intervention strategy involving charging for on-site workplace car parking while

providing free off-site parking within walking or cycling distance. While it is important to note that the effects of such interventions on walking and cycling remain to be evaluated, we have shown in qualitative research that a consideration of the relative costs of alternative modes of transport is particularly salient for commuters who are reconsidering their travel options after moving home or workplace.[23]

Safety

Review-level evidence for the associations between walking or cycling and perceptions of safety is equivocal.[11-13] This probably reflects the variable methodological quality of the studies and the measures used. Our recent research suggests some possible reasons for these mixed associations. In particular, we have investigated the reasons why some people report walking or cycling to work despite also reporting their routes to be unsafe or inconvenient for walking or cycling.[24] We found that commuters often developed coping strategies to deal with an unsupportive environment and that under these circumstances other factors, such as people's caregiving responsibilities, their enjoyment of walking or cycling, or the availability of car parking at the destination were more important influences on behaviour than the environmental conditions along the route. This is not to say that improving the safety of routes for walking or cycling might not be important for encouraging people to switch from other modes of transport.

Conclusions

The logic model for this NICE guidance suggests that interventions targeting knowledge, awareness, attitudes, beliefs and social norms may be translated into changes in walking and cycling behaviour. While this model is consistent with other conceptual models of evaluation that illustrate how it is thought that interventions might operate,[25] there is currently little empirical evidence to show that interventions to promote walking and cycling do work in this way in practice and it does not necessarily follow that interventions targeting such factors as attitudes and awareness will be successfully translated into sustained behaviour change. Furthermore, creating environments that are more supportive of active travel might be an equally or more effective strategy because it might itself result in changes in attitudes or perceptions regarding the relative safety or convenience of alternative modes of transport. Future evaluative research in this area should focus not only on quantifying the behavioural effects of interventions, but also on investigating how interventions operate to promote walking and cycling and how 'individual' and 'environmental' approaches might be effectively combined.

Key points

- Systematic reviews have found some evidence that walking and cycling can be promoted through interventions.
- Certain types of intervention have been evaluated more than others. It does not necessarily follow that these are the most effective approaches, particularly if population health gain and the reduction of social inequalities in health are the goals
- The practices of walking and cycling are shaped by contextual factors such as the distance to destinations and the cost, convenience and reliability of alternative modes of transport. Many of these are factors amenable to local interventions
- Walking and cycling could be promoted as part of longer journeys by car or public transport.

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