

On the buses: a mixed-method evaluation of the impact of free bus travel for young people on the public health

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Scientific summary

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Background

Despite a rising interest in transport and health among public health professionals there is a lack of robust evidence on the public health impact of transport interventions. In September 2005, London introduced a policy granting young people aged < 17 years access to free bus and tram travel. A year later this policy was extended to people aged < 18 years in education, work or training. The free bus travel intervention was part of a broader environmental strategy in London to reduce private car use, but its primary aim was to decrease 'transport exclusion', and ensure that transport costs did not deter access to goods, services, education and training opportunities for young people. We would expect that this would increase health, as transport access is linked to well-being. However, an intervention that aims to change the travel patterns of such a large segment of the population may very well have other health effects. These may include young people walking less often or less far, and thus taking less exercise (but also reducing risk of pedestrian injury), or being more exposed to minor crime and assault as they travel further for longer distances. Free bus travel for young people might also reduce access other age groups have to transport if, for instance, the buses become too full or older people are intimidated.

There are real challenges in evaluating the impact of large-scale transport interventions in complex environments. The causal pathways by which transport interventions might affect transport mode choice and therefore health are currently poorly understood; transport interventions occur at the same time as other changes so it can be difficult to assess how far the intervention has caused any changes in health outcomes and in complex environments there are often no obvious comparison or 'control' areas to help contextualise changes. In the absence of randomised controlled trial (RCT) evidence (generally not possible with large transport interventions) there is a real need to develop robust observational methods to evaluate potential health impacts. Free bus travel provides a case study for using 'natural experiments' to develop the evidence base on transport and health, and for exploring how far existing data sets can be used to evaluate policy interventions.

Aims

This study aimed to evaluate the impact of free bus travel on public health, using a mixed-method design, and to assess the economic costs and benefits of the scheme. Our specific aims were to:

- provide empirical evidence for the impact of this intervention on key health behaviours and outcomes (e.g. injuries, active travel) for young people
- explore the effects on the determinants of health (e.g. access to education and training)
- identify the effects of increased young people's access to bus travel on older citizens
- develop and apply methods for economic assessment, and
- contribute to the development of methods to strengthen causal inference in non-randomised designs.

Methods

To assess these health effects of free bus travel we drew on three main sources of data: qualitative data, quantitative data and literature reviews.

Qualitative data

We interviewed 119 young people and 47 older citizens from a range of backgrounds to find out how they experience transport, and the ways in which they feel that access and use influences their health and well-being. We spoke to participants in focus groups (66 young people, 18 older citizens) and individual or paired interviews (53 young people, 29 older citizens). Participants were largely selected from four areas of London, chosen to represent two outer London boroughs (Havering and Sutton) and two inner London (Islington, and Hammersmith and Fulham) with a range of transport availability.

Questions focused on generating stories by asking about modes of travel to and from main daytime destination, and in the evenings and at weekends; experiences, benefits and disadvantages of different transport modes and experiences of interactions with others when travelling.

Transcripts and notes were analysed qualitatively, drawing on techniques from the constant comparative method, including detailed open coding of early segments of data, close attention to comparisons within the data (for instance in comparing young people's accounts in stories and in addressing direct questions) and context (e.g. in comparing accounts in focus groups and interviews).

Quantitative data

We used a number of different routine data sources to measure as robustly as possible the overall impact of free bus travel for young people on the transport patterns of young people, the transport patterns of older citizens and the incidence of road traffic injuries and assaults in young people.

We estimated changes in travel patterns using the London Area Transport Survey (LATS) (2001) and London Travel Demand Survey (LTDS) (2005–8). These surveys sampled 30,000 households in 2001 and 8000 households annually since 2005 across London. In every sampled household each person aged > 5 years is asked to complete a 1-day travel diary to record the start, interchanges (e.g. change from bus to train) and end of every journey made on that day.

We estimated changes in road traffic injuries using the STATS19 Road Accident data set (2001–9), the official data set of death and personal injuries from road traffic collisions that occur on the public highway in the UK.

We estimated changes in the incidence of assaults using Hospital Episode Statistics (HES) (2001–9). We identified hospital admissions due to assaults using the *International Classification of Diseases*, Tenth Edition (ICD-10; external causes of morbidity and mortality codes X85–Y09).

Our analysis compared the pre–post intervention changes in outcomes (travel patterns, injuries, assaults) in a population affected by free bus travel (young people aged 12–17 years) with the change seen in a population not affected by the intervention, adults aged 25–59 years.

Literature reviews

We drew on the transport studies literature on evaluating the costs and benefits of transport strategies to examine the costs and benefits of this policy, from the perspectives of the economy, environment and society. We conducted a systematic review of prospective studies of the health benefits of active travel.

Results

What effect has the scheme had on use of bus travel by young people in London?

In the context of rising levels of bus use in London, there was no quantitative evidence that the scheme itself had increased the number of journeys with the bus as the primary mode, or the number of kilometres travelled by bus by young people compared with adults. However, these had gone up overall

for both groups, and the number of short journeys travelled by bus had risen. The qualitative data provided some evidence that, because the scheme was both cost free to young people at the point of use and universal, it contributed to bus travel becoming the 'default' mode for many journeys and buses becoming a key site of social activity for young people.

What impact has the scheme had on active travel?

Although the number of journeys with walking as a main mode decreased, there was little evidence that overall levels of active transport had reduced, in part because bus travel entails some walking, and the scheme had generated additional journeys. Few journeys are made by bicycle in London, and compared with adults (for whom cycling rates had gone up), young people were cycling less after the introduction of free travel. Young people's accounts suggested that cycling was not, in general, considered a candidate transport mode, but we do not know whether or not this has changed since the introduction of free travel. On balance, then, it is difficult to attribute changes in cycling to the introduction of free bus travel, although reasonable to suggest that free bus travel for all would militate against other attempts to increase cycling rates.

Has the scheme fostered sustainable transport?

The quantitative data indicated that journeys by car declined in both adults and children, but it is difficult to attribute these changes to the scheme rather than other interventions over the same period. Qualitative evidence suggested that in outer London in particular, free bus use had displaced some car journeys. The qualitative data suggested that although young people still expected to learn to drive as a rite of passage to adulthood, bus use had been 'normalised' by the intervention such that it was not seen as a transport mode of last resort.

What impact has the scheme had on safety?

We assessed the associations between the scheme and road traffic injuries and assaults. We identified a relative reduction in road traffic injuries which was consistent with the mode changes observed (i.e. a reduction in car occupancy and in cycling). Against a background decline in road traffic injury (RTI) rates, the decline seen in 12- to 17-year-olds was greater, primarily reflecting declines in car and cycling injuries after the introduction of the free bus travel scheme.

Quantitative evidence indicated that assaults in young people had risen compared with adults in London and with the national population of young people. However, the increase predated the introduction of free bus travel. Qualitative evidence suggested that for most young people, the risks associated with travel were to some extent mitigated by free bus travel, which allowed 'practice journeys'; a contingency plan for avoiding getting stranded and (for girls) a perceived safer alternative to walking.

Has the scheme reduced social exclusion?

Quantitative data suggested a rise in the number of journeys to school or work after the scheme was introduced, but no evidence of a flattening of the socioeconomic gradient of travel for educational purposes. Qualitative data suggest that transport exclusion is not a barrier for young people in London. For those able to use the bus service, the scheme has ensured that all can access education, training and the social opportunities essential for social inclusion. For young people with disabilities, however, buses represented a barrier to, rather than a facilitator of, social inclusion.

Although we could not directly measure the effect of the scheme on young people's well-being, the qualitative data suggested a number of benefits from increased bus use for young people, including increased ability to be independently mobile, increased control over their travel, and fostering a feeling of 'belonging' to London. These are difficult to quantify, but confidence, independence and a sense of belonging make an important contribution to young people's well-being.

Has the scheme displaced older people from buses?

There was no quantitative evidence that young people's free travel had displaced older citizens from the buses. The qualitative data suggest that older citizens often preferred to travel at non-school (and non-commuter) times for reasons of comfort and convenience, but did not experience young people as a constraint on their travel behaviour.

Does the scheme represent value for money?

From the perspective of the cost–benefit framework and representative year 2009, the policy has reduced road traffic casualties, increased bus travel and reduced car travel while not reducing levels of active travel in the city. In the base case the monetised benefits have substantially outweighed the costs, providing what the Department for Transport (DfT) considers 'high' value for money.

Conclusions

To address some of limitations in quasi-experimental designs, we have integrated quantitative and qualitative evidence as part of a multimethod approach to build up an assessment of public health impacts of free bus travel in an iterative way, and assessed these in the light of the broader changes that happened in London, particularly the growth of bus transport. The intervention is best conceptualised as 'universal free travel for young people in the context of an efficient and accessible bus network'. Our findings suggest this intervention has had the following implications for public health:

- The most significant implications of the free travel scheme for the public health of young people and London as a whole may be on young people's well-being, which is difficult to measure. The free bus travel scheme offered different possibilities for young people to travel together; it opened up the bus network as a place for sociability, and enabled both the opportunities to enact 'independence' and the opportunities to develop skills in independent travel.
- There are mixed implications for physical exercise. We did not identify strong evidence of a negative impact on distances walked, given that the scheme appeared to generate new trips, and replaced some more 'passive' car travel. However, we also found no evidence of a beneficial effect. Cycling was not considered a candidate mode of transport for young people, and had declined relative to adults, though from a low base.
- The scheme has removed one important contributor to transport exclusion for young people: transport costs. This is an important condition for social inclusion, but the experiences of young people with disabilities suggested it is not a sufficient condition in the absence of an accessible bus network.
- In the context of a good bus system, the scheme contributes to the 'normalisation' of bus travel, which has been identified as an important precondition of decreased dependence on cars for transport.

To further our understanding of how transport interventions such as this contribute to health, the determinants of health and health inequalities, the following are research priorities:

1. Our systematic review identified a paucity of robust research on the health impacts of increasing the amount of 'active transport' in the population, despite promising cross-sectional evidence that those who do more walking and cycling are healthier. Intervention studies are urgently needed to improve the evidence base in this area.
2. One policy driver of this intervention was the desire to inculcate 'healthier' travel habits among young people, and reduce future car dependence. It is not known, however, how far transport mode choices in adolescence are maintained into adulthood, or how far mode changes achieved in interventions are maintained long term. More research from cohort studies is needed on the maintenance of transport mode change habits, and more qualitative research on the role of driving in young adulthood.
3. This study has suggested that, in London, where bus travel has been 'normalised', bus travel does not carry the stigma associated with it reported in other research. This suggests that an important influence on transport mode choice is the cultural associations of those modes. As these are likely to vary across

populations, and over time, more research is needed on how environments, policies and cultures interact to make (for instance) walking, cycling or public transport use more or less common across population groups. More research is also needed on how public transport provision alters young people's orientations to, and use of, car transport.

4. The economic cost–benefit analysis (CBA) relied on monetised benefits from the scheme which are based on standard adult values. To inform economic evaluations in the area of transport and health, more research is needed on how differences in value of a statistical life for children might affect cost–benefit calculations.

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