

Guest editorial

Surfing the environmental wave and injury control

In whatever direction a ship is moving the surge where the prow cuts the waves will always be noticeable ahead.... Whichever way the ship turns, the surge which neither directs nor accelerates her movement will always foam ahead of her and at a distance seems to us not merely to be moving on its own account but to be governing the ship's movement also.

Leo Tolstoy

In *War and Peace*, Tolstoy uses the analogy of the bow wave of a ship to represent the illusion of bureaucratic control of the destiny of nations. Tolstoy understood that mass social change is seldom the anticipated outcome of carefully planned strategy, but that when strategic aims are met, albeit fortuitously, the illusion of control can be compelling. His analogy might also be invoked to describe the role of the UK Department of Health in achieving the Health of the Nation injury reduction targets. Although injury death rates have fallen, this is may not be the anticipated result of government health strategy, but primarily a consequence of changing transportation patterns, forces over which the Department of Health had little or no control. In this paper we examine the forces that on this occasion appear to have resulted in fewer deaths, and suggest how these and other social trends might be steered towards more favourable policy destinations.

Transportation trends and road injury death rates

The British government's strategy for health, *The Health of the Nation* aimed to reduce the injury death rate among children under 15 by at least 33% by the year 2005.¹ If present trends continue, this target will almost certainly be achieved, and probably exceeded. Between 1985 and 1992 the child injury death rate declined by 34%.² Because pedestrian and cycling deaths account for around 40% of all such deaths, these mechanisms of injury have a considerable effect on total injury mortality, and it is only for pedestrian and cycling injuries that mortality reductions are in excess of the Health of the Nation targets. However, a substantial proportion of the decline in pedestrian and cycling deaths has been at the expense of children's walking and cycling.² Between 1985 and 1992 the average number of miles walked per child fell by 20%, and average cycle mileage fell by 26%. At the same time, the number of miles travelled by car increased by 40% from 2259 miles in 1985 to 3158 miles in 1992. In a car based transportation system it is safer to be inside the car than outside, so the net effect of these changes has been fewer road deaths.

For people aged 15–24, a less ambitious target was set, to reduce the injury death rate by 25% by 2005. This was well judged because for people in this age group temporal trends in transportation patterns are far less auspicious. Teenagers and cars are a dangerous mix.³ Road crash death rates in the late teenage years are higher than at any other age. Between 1985 and 1995 the number of miles travelled by car increased by 35% from 2819 miles in 1985 to 3793 miles in 1995.⁴ As a result, despite a 27% reduction in the

death rate per passenger mile, there has been no significant fall in the death rate per head of population.⁵

Fortunately, there have been some favourable trends. Motorcycle mileage has fallen by 78%. Because the death rate per mile travelled is many times higher for motorcycles than for cars, the fall in mileage has resulted in a substantial reduction in death rates. Motorcycle deaths account for about 16% of all injury deaths in people aged 15–19, so the decrease in motorcycling has had a noticeable effect on total injury mortality.⁵

Considerations of equity

The social class gradient for deaths due to injuries is steeper than for any other cause of death in childhood. With the recent publication of *Variations in Health* the government has signalled its resolve to tackle these inequalities.⁶ But riding the bow wave of transportation trends is not a good strategy for reducing social gradients. Between 1981 and 1991, the traffic injury death rate for children under 15 fell by 30% in social class I, but only 1% in social class V.⁷ Over the same period, the pedestrian death rate fell by 28% in social class I, but only 15% in social class V. These observations are all the more remarkable considering that the baseline pedestrian death rate in social class V (26.3/100 000) was over four times that in social class I (6.1/100 000). However, bearing in mind that the reason that pedestrian death rates have fallen is that children are being driven more, and that car travel is rationed on the basis of ability to pay for it, the widening social differential should not be surprising.

Even for children in the most disadvantaged social groups, the decline in the pedestrian death rate does not necessarily mean that walking is getting safer. The decline is much more likely to be due to a reduction in the case fatality rate, for example from improved emergency care. Between 1989 and 1995 the probability of injury death at any given level of severity fell by 16% per year.⁸ Indeed, given the magnitude of the decline in case fatality, the fall in injury death rates is even compatible with an increase in the rate of occurrence of injuries. This is almost certainly the case for children in the most disadvantaged social classes.

Favourable trends?

While we may be tempted to give ourselves a pat on the back about injury reduction,⁹ "gains" in this area must be offset by losses in the areas of physical activity and environment. In March 1996 the government launched its strategy statement on physical activity.¹⁰ The heart of this strategy was the promotion of moderate physical activity, such as everyday walking and cycling. Because patterns of physical activity forged in childhood are likely to carry over into adult life, walking in childhood was targeted for intervention.¹⁰ Walking in adult life has been shown to contribute to the prevention of cardiovascular disease, diabetes, osteoporosis, and hypertension.¹¹ In the Honolulu Heart Program the death rate among men who walked

less than one mile per day was nearly twice that among those who walked more than two miles per day.¹² It is estimated that one in four women living to age 90 will sustain a hip fracture.¹³ There is a linear relationship between the risk of hip fracture and bone mineral density. In women, bone density peaks in early adulthood, remains stable until the menopause, and then falls. Bone density in old age depends on peak density and rate of loss.¹³ Physical activity increases both peak density and reduces postmenopausal loss. The decline in walking is thought to be one of the main reasons for the doubling of hip fracture rates since the 1960s.¹³ In view of the documented health benefits of walking, current transportation patterns make sad statistics. Similarly, if the government takes forward the proposal to make the environment a key area for the Health of the Nation, projected transportation trends will be a formidable obstacle to progress.¹⁴ Traffic volume is expected to almost double between 1994 and 2025. Although government proposals show “particle preference”—a preoccupation with the health effects of small particles like radon and nitrogen dioxide, rather than big particles like cars and trucks—road transport emissions will have to be tackled sooner or later.

Surfing the environmental wave

Transportation trends may have resulted in fewer road deaths but they are also likely to have had adverse health consequences. Are there other social trends that might work to mitigate these adverse effects? In *The New Public Health*, Ashton and Seymour discuss the tactic of “social science surfing”, a health promotion strategy that involves recognising a ripple of social change, learning about it as it develops into a wave, and then riding with it, attempting to steer a course.¹⁵ Politicians have for some time recognised the rise of the environmental wave. When the environmental activists emerged from their underground protest at the site of the proposed road building schemes near Exeter in southern England, the newspapers were unsure whether to portray them as benefit scrounging troglodytes or national heroes. And there are several reasons why the environmental wave will continue to grow. First, because road capacity in the UK cannot be increased sufficiently to meet demand, demand has to be reduced to meet supply.¹⁶ There is little political disagreement about this. Second, as the baby boomer generation ages, recreational walking and cycling will come to hold more appeal than the aerobics class.

Surfing the environmental wave would not imply that injury reduction is unimportant. On the contrary, it may be a more efficient strategy for achieving this aim. For motor vehicle occupants, the fall in death rates per passenger mile that has resulted from safer cars and improved traffic engineering has been offset by large increases in car travel.⁵ It is very unlikely that the fall in injury rates per passenger mile could be reversed, in which case strategies to reduce car travel would result in sizeable injury reductions. Because pedestrian injury risk increases almost exponentially with increasing traffic volume this might also reduce pedestrian injury rates.¹⁷ But getting people out of cars will only reduce total injury mortality if the alternatives, walking and cycling, are safe. This could be achieved by banishing traffic from the centres of towns and cities. For the first time this century doing so might not be political suicide. Air pollution, noise, and congestion are an everyday urban

reality. Reducing traffic volume for reasons of quality of life is likely to be easier to sell than traffic reduction for injury control.¹⁸ Injury is important, but the burden of injury falls disproportionately on the poor, and poor people have no clout.

Already there are signs that safety and environmental agendas are converging. The Road Traffic Reduction (UK Targets) Bill was a private members bill that had its second reading in January 1998. If enacted the Secretary of State is required to set national targets for road traffic reduction. The bill was supported by a range of health and environmental groups, including the British Medical Association, Barnardos, Child Accident Prevention Trust, Green Party, Faculty of Public Health Medicine, and Friends of the Earth.¹⁹ The bill passed its second reading unopposed.

Conclusion

A large proportion of the decline in injury death rates is likely to be the result of changing transportation patterns, and much of the remainder is due to reduced case fatality. Changes in transportation patterns however, may have important adverse consequences for physical activity levels and quality of the environment. The increasingly powerful environmental lobby provides a unique opportunity for injury control. Sustained reductions in injury occurrence will best be achieved by reducing car mileage and creating opportunities for safe walking and cycling. Popular concerns about pollution, congestion, and noise will be the primary motivation for change. Linking environmental and health agendas at national and local levels, and surfing the environmental wave, has the potential to reap substantial benefits for both.

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- 1 Department of Health. *The health of the nation*. London: HMSO, 1991.
- 2 DiGiuseppi C, Roberts I, Li L. Influence of changing travel patterns on child injury death rates. *BMJ* 1997;314:710-3.
- 3 Woodroffe C, Glickman M, Barker M, et al. *Children, teenagers and health: the key data*. Bury St Edmunds: Open University Press, 1993.
- 4 Department of Transport. *Transport statistics report*. London: HMSO, 1995.
- 5 DiGiuseppi C, Li L, Roberts I. Influence of teenage travel patterns on injury death rates in England and Wales: 1985-1995. *BMJ* 1998;316:904-5.
- 6 Department of Health. *Variations in health: what can the Department of Health and the NHS do?* London: HMSO, 1995.
- 7 Roberts I, Power C. Does the decline in child injury death rates vary by social class? *BMJ* 1996;313:784-6.
- 8 Roberts I, Hollis S, Campbell F, et al. Declining injury rates for children and young adults: the contribution of hospital care. *BMJ* 1996;313:1239-41.
- 9 Department of Health. *Fit for the future: second progress report on the health of the nation*. London: HMSO, 1995.
- 10 Department of Health. *Strategy statement on physical activity*. London: Department of Health, 1996.
- 11 Morris J, Hardman A. Walking to health. *Sports Med* 1997;23:306-32.
- 12 Hakim AA, Petrovitch H, Burchfiel CM, et al. Effects of walking on mortality among non-smoking retired men. *N Engl J Med* 1998;338:94-9.
- 13 Law MR, Wald NJ, Meade TW. Strategies for prevention of osteoporosis and hip fracture. *BMJ* 1991;303:453-9.
- 14 Walker A. Environment—a new key area for the health of the nation? *BMJ* 1996;313:1197-9.
- 15 Ashton J, Seymour H. *The new public health*. Milton Keynes: Open University Press, 1988.
- 16 Department of the Environment, Transport and the Regions. *Developing an integrated transport policy: an invitation to contribute*. London: DETR, 1997.
- 17 Roberts I, Norton R, Jackson R, et al. Effect of environmental factors on risk of injury of child pedestrians by motor vehicles: a case-control study. *BMJ* 1995;310:91-4.
- 18 Friends of the Earth. *Less traffic, better towns: Friends of the Earth's illustrated guide to traffic reduction*. London: Friends of the Earth Trust Limited, 1992.
- 19 Roberts I. Road traffic reduction. *BMJ* 1998;316:242-3.