

SEAT BELT LEGISLATION IN BRITAIN

After many years of Parliamentary debate a law compelling front seat occupants of cars and vans to wear seat belts came into effect in Britain at the end of January 1983. Since the beginning of 1981 there have been in Britain three official studies of the efficacy of seat belt legislation:

- *Seat Belt Savings: implications of European Statistics*. J.E. Isles. STG Division, Department of Transport, 2 Marsham Street, London SW1P 3EB, April 1981.
- *The Medical Effects of Seat Belt Legislation in the United Kingdom*. Department of Health and Social Security, Research Report 13, HMSO, 1985, £8.30 (also known as the Rutherford Report).
- *Compulsory Seat Belt Wearing: report by the Department of Transport*. HMSO, 1985, £7.50 (also known as the Durbin and Harvey Report). The methods and conclusions of this report are contained in a paper presented to the Royal Statistical Society in London on 19 March 1986, to be published in the *Journal of the Royal Statistical Society (A)* (1986) in a paper entitled "The Effects of Seat Belt Legislation on British Road Casualties: A Case Study in Structural Time Series Modelling", A.C. Harvey and J. Durbin.

The first of these studies examined the effect of seat belt legislation in eight western European countries which had passed belt laws. It concluded that there was no evidence of a beneficial effect, and that the statistics contained a strong hint of a perverse effect. This study was never published and only became known when it was shown unofficially to *New Scientist* four years later (7 February, 1985, p.7). The results of this study were available, but not made known to Parliament at the time that it voted on ^{the} seat belt law.

The Rutherford study examined changes in the pattern of injuries sustained in car accidents by patients arriving at fifteen hospitals in the United Kingdom in the year before and the year after the introduction of the seat belt law. It concluded that there had been a 15 per cent reduction in patients brought to hospital and a 25 per cent reduction in those requiring admission for treatment. These reductions the study attributed to the effect of the seat belt law.

The Durbin and Harvey study examined time series data for road accident fatalities and serious injuries for the period from 1969 to the end of 1984, and sought to isolate the effect of the "intervention" (belt law) at the end of January 1983. They concluded that when all categories of road user

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were considered the net reduction in fatalities attributable to the seat belt law was about 200 per year - a decrease from 5934 in 1982 of 3.4 per cent.

There are six reasons for supposing that both the Rutherford report and the Durbin and Harvey report have over-estimated the beneficial effect of the law.

1. The Rutherford report deals only with injuries sustained by car occupants, and thus ignores the adverse effects which the Durbin and Harvey report suggests were suffered by pedestrians and cyclists. Although a possible "risk compensation effect" (drivers compensating for the added security of a belt by driving more heedlessly) was much discussed at the time, the Rutherford study did not investigate this possibility.

2. The Rutherford report was based on a one year before-and-after study. It made no allowance for an established downward trend. Thus it attributed to seat belt legislation effects which might properly have been attributed to the trend.

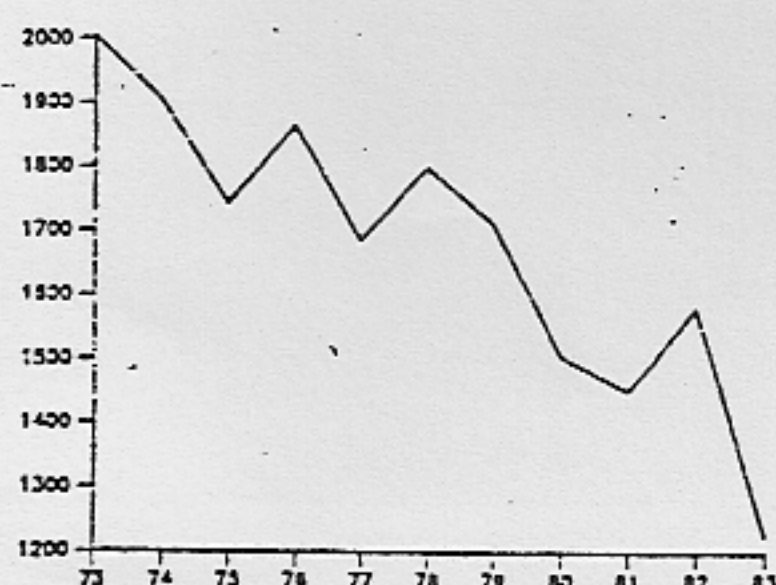
3. Durbin and Harvey based their estimate of a net saving of 200 lives a year on an estimated increase in pedestrian fatalities of 8%, and in cyclist fatalities of 13%. But these estimates are based on their modelling of all such fatalities. They disregard their own finding that the increases in numbers of pedestrians and cyclists killed by cars and vans were 13% and 40% respectively. The number of pedestrians and cyclists killed by Heavy Goods Vehicles and Public Service Vehicles, vehicles to which the law did not apply, decreased. These results highlight the significance of the failure of the Rutherford report to consider casualties suffered by road users other than car occupants.

4. The serious injury data and the fatality data tell different stories; the fatality data indicate a much larger adverse effect of the law on pedestrians and cyclists. Durbin and Harvey consistently prefer to rely on the serious injury data because the numbers are much larger. However the fatality data are much more accurate. For pedestrians and cyclists injuries are grossly under-reported - by as much as 86 per cent according to one study of cyclist injuries. The definition of serious injuries is acknowledged by the British Medical Association to be so broad as to be virtually useless - it covers everything from a broken finger to total paralysis.

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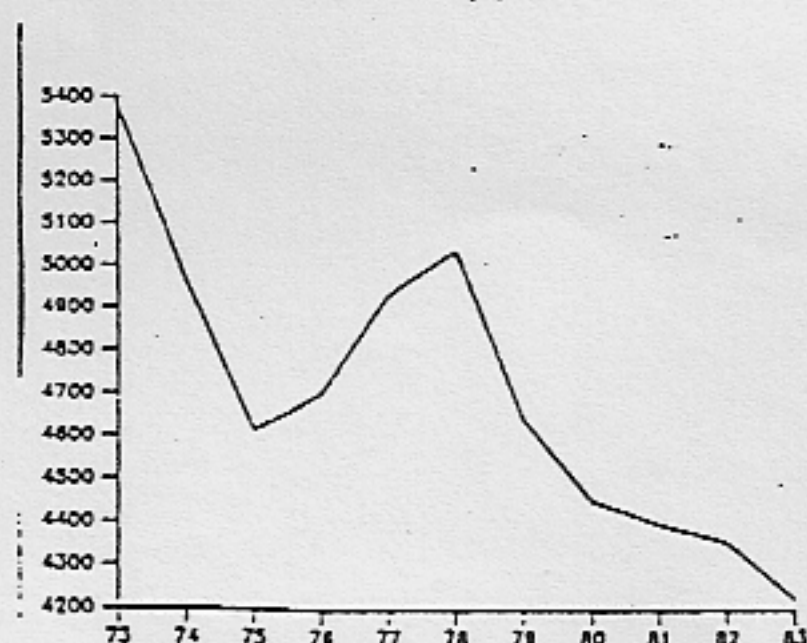
5. In 1982 the proportion of dead drivers with blood alcohol levels above the legal limit increased from 31% to 36%. All of the increase in fatalities in 1982 occurred during the "drink-drive hours" (2200 - 0359). Thus the increase in fatalities in 1982, when some of Durbin and Harvey's models show signs of breaking down, could have been an alcohol effect. In 1983 the proportion of over-the-limit dead drivers fell back to 31%. The reduction in fatalities in 1983 during the "drink drive hours" was 23%, and in all other hours only 3% (see Figures 1 and 2). Rutherford, Durbin and Harvey attribute all of the decrease in front seat car and van casualties in 1983 to the belt law. Their models include no alcohol variables, and they allow the reduction in drunken driving in 1983 credit for saving not a single life.

Figure 1



Road Deaths GB between the hours 2200-0359.

Figure 2



Road Deaths GB between the hours 0400-2159.

Source: *Road Accidents Great Britain 1984*, Table 7, HMSO, 1985.

6. Durbin and Harvey made no attempt to place the British evidence in the context of evidence from other countries which have passed belt laws. Because of the possible effects of innumerable confounding variables, the results from one country in isolation may be inconclusive. But there is no clear evidence from any country of a net beneficial effect attributable to a belt law (Adams 1985a, 1985b).

If one trusts the accurate numbers (fatalities) rather than the large numbers (serious injuries), if one isolates the

pedestrians and cyclists killed by cars and vans, if one allows the reduction in drunken driving a reasonable share of the credit for the decrease in fatalities in 1983, and if one considers the evidence from other countries, the balance of the evidence from all three official reports tilts strongly in favour of the conclusion that there has been no net life-saving benefit attributable to the belt law in the Britain - only a shift in the burden of risk from the best protected to the most vulnerable road users.

References

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