SHORT REPORT

Does rear seat belt use vary according to socioeconomic status?

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Policy measures, including legislation, are one method of promoting health. Participation in many voluntary health promoting behaviours is strongly socioeconomically patterned,¹ and this may also apply to behaviours governed by legislation.

Rear passenger seat belt use is one legally prescribed behaviour—having been made compulsory in the UK in 1991. Previous research on the socioeconomic distribution of seat belt use has relied on self reported behaviours and is therefore subject to response bias, has focused on driver seat belt use, or has been undertaken in the USA where legislation is different from the UK.^{2–3}

We conducted the first UK based observational study to investigate the association between rear passenger seat belt use and socioeconomic status (SES), using car value as a proxy measure of SES.

METHODS AND RESULTS

We observed 1032 rear seat passengers (RSPs) in 773 cars at six locations with slow car flow (for example, roundabouts and junctions) in Newcastle upon Tyne, UK over two 90 minute periods in June 2003. Details of cars containing RSPs (make, model, specification, and year of registration) and of all RSPs (approximate age, sex, position in the car, and seat belt use) were recorded. Cars registered before April 1987, when legislation requiring all new cars to be fitted with rear seat belts came into force, were excluded (n=3). Approximate age of RSPs was recorded as either babies in restraints, child under 14 years of age, or adult over 14 years of age. We estimated car value from recorded car details using an online car valuation guide (see web extra available at <http://www.jech.com/supplemental>). A separate validation study confirmed a reasonable correlation between car value estimated in this way and the registrar general's social class of the car owner (n=173, Spearman's $\rho = -0.30$, $p < 0.0001$) (see web extra).

After exclusions, full data were available for 1026 RSPs. The range of car values observed (£155–£36 000) was skewed towards lower values (median £4428, IQR £2240–£7858). Overall, 74% of RSPs observed were wearing seat belts. Use did not vary by sex, but did vary by age, with 95% of babies in

restraints, 76% of children, and 61% of adults wearing seat belts ($\chi^2 = 72.60$, $df = 2$, $p < 0.001$).

A significant trend was observed in RSP seat belt use by quintiles of car value (see table 1), with a 2.2-fold increase in the odds of wearing a seat belt between the lowest and highest quintiles of car value. This trend remained after controlling for age and sex of RSPs ($\chi^2 = 7.9$, $df = 4$, $p = 0.005$).

COMMENT

In this, the first study of its type, we found that RSP seat belt use was significantly higher in people travelling in cars of greater value. Furthermore, car value was shown to be strongly associated with one well used measure of SES. These findings reflect previous work concerning the socioeconomic distribution of other health related behaviours.¹

Because of the difficulty of recording the details of moving cars, our observations may have been subject to error. However, observation avoids the potential bias associated with self reported seat belt use and we believe observational methods have the greatest potential for accuracy in this area. However, further work is required to confirm the accuracy and to investigate the representativeness of such observational data.

Despite an overall increase in rear seat belt use since it was made compulsory,⁴ compliance continues to depend largely on the voluntary behaviour of drivers and passengers. In common with other voluntary health promoting behaviours, our results suggest that seat belt use seems to be socioeconomically patterned,¹ particularly among those old enough to enforce their own decisions on seat belt use. Such variations in response to compulsory health promotion interventions deserve further investigation, and, although there is controversy over the overall public health benefit of seat belt legislation,⁵ should be considered when developing interventions to reduce the associated socioeconomic inequality in car passenger injuries.⁶

Abbreviations: SES, socioeconomic status; RSP, rear seat passenger

Table 1 Seat belt use by rear seat passengers according to quintiles of car value

Quintile of car value (value range)	Number of rear seat passengers wearing a seatbelt (%)				Odds ratio (95% confidence intervals)*
	Babies in restraints	Children, <14	Adults, 14+	All	
1 (£155–£1902)	31 (100)	65 (72.2)	43 (53.1)	139 (68.8)	1.00
2 (£1903–£3431)	31 (93.9)	73 (73.0)	42 (61.8)	146 (72.6)	1.20 (0.78 to 1.85)
3 (£3432–£5613)	32 (91.4)	67 (79.8)	45 (53.6)	144 (70.9)	1.09 (0.71 to 1.67)
4 (£5614–£8937)	40 (93.0)	61 (74.4)	52 (65.8)	153 (75.0)	1.33 (0.86 to 2.06)
5 (£8938–£36000)	30 (100)	99 (81.1)	42 (77.8)	171 (83.0)	2.15 (1.34 to 3.44)
All cars	164 (95.4)	365 (76.4)	225 (61.3)	754 (73.5)	

*Odds ratio of rear seat passengers wearing seat belts in each quintile of car value compared with lowest quintile.

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CONTRIBUTIONS

Jean Adams, Peter Heywood, and Martin White conceived the study, oversaw the development of methods, data collection, data entry, data analysis, and paper writing and will act as guarantors. Frances Colgan, Jo Petrie, and Amy Gospel helped develop the methods and took part in data collection, data entry, and paper writing. Frances Colgan drafted the paper. The following stage 3 medical students at Newcastle University contributed to the development of methods, data collection and data entry: Emma Bryant, Bevin Bhoyrul, Christopher Coldwell, Sarah Dawson, Benjamin Goodman, Rahul Gujadhur, Helmy Haja Mydin, Reem Hasan, and Joanne Lee.

Information on estimating car values and the validation study of car value as a marker of socioeconomic status is available on the journal web site (<http://www.jech.com/supplemental>).

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ECHO

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Mortality in relation to smoking: 50 years' observations on male British doctors

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Objective: To compare the hazards of cigarette smoking in men who formed their habits at different periods, and the extent of the reduction in risk when cigarette smoking is stopped at different ages.

Design: Prospective study that has continued from 1951 to 2001.

Setting: United Kingdom.

Participants: 34 439 male British doctors. Information about their smoking habits was obtained in 1951, and periodically thereafter; cause specific mortality was monitored for 50 years.

Main outcome measures: Overall mortality by smoking habit, considering separately men born in different periods.

Results: The excess mortality associated with smoking chiefly involved vascular, neoplastic, and respiratory diseases that can be caused by smoking. Men born in 1900–1930 who smoked only cigarettes and continued smoking died on average about 10 years younger than lifelong non-smokers. Cessation at age 60, 50, 40, or 30 years gained, respectively, about 3, 6, 9, or 10 years of life expectancy. The excess mortality associated with cigarette smoking was less for men born in the 19th century and was greatest for men born in the 1920s. The cigarette smoker versus non-smoker probabilities of dying in middle age (35–69) were 42% v 24% (a twofold death rate ratio) for those born in 1900–1909, but were 43% v 15% (a threefold death rate ratio) for those born in the 1920s. At older ages, the cigarette smoker versus non-smoker probabilities of surviving from age 70 to 90 were 10% v 12% at the death rates of the 1950s (that is, among men born around the 1870s) but were 7% v 33% (again a threefold death rate ratio) at the death rates of the 1990s (that is, among men born around the 1910s).

Conclusion: A substantial progressive decrease in the mortality rates among non-smokers over the past half century (due to prevention and improved treatment of disease) has been wholly outweighed, among cigarette smokers, by a progressive increase in the smoker v non-smoker death rate ratio due to earlier and more intensive use of cigarettes. Among the men born around 1920, prolonged cigarette smoking from early adult life tripled age specific mortality rates, but cessation at age 50 halved the hazard, and cessation at age 30 avoided almost all of it.

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