

SP-2006-16 - ABSTRACT

DEPRIVATION AND ROAD SAFETY

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The overall objective of this project was to examine in more detail associations between area-based deprivation and road casualties. In particular, this project examined associations between deprivation and specific sub-categories of pedestrian and cyclist casualties. These included different levels of casualty severity (fatal, serious, and slight), whether the crash took place in darkness, and for pedestrians, young and older age cohorts, and the location of the pedestrian in or near the road (on refuges, footways or verges, and crossings).

Data for England was analyzed based on nearly 8000 Wards. The index of multiple deprivation, which is a combination of various factors associated with the deprivation of an area, was used as the key variable of interest. Various statistical methods were examined, including a novel procedure to bootstrap data when zero-counts were large. In the end, negative binomial regression models were used. Various control variables including road density, employment density and population were included in the models.

Results found that in most cases, deprivation remains associated with most of the categories of pedestrian casualties. While some cyclist casualties are associated with deprivation, the effect tends to be less than for pedestrian casualties (perhaps because there is less cycling in these areas). Pedestrian fatalities in darkness were not associated with deprivation, perhaps because these occur in more rural areas; injuries, however were associated with deprivation. Results for cyclist casualties in the dark are a bit more ambiguous. We were unable to estimate a model for cyclist fatalities in the dark, mainly due to the low number of cyclist fatalities after dark (only 38 across all of England in our database). We see a positive association with slight injuries but no statistically significant effect for serious injuries.

We also found that the association of deprivation with pedestrian casualties is strongest for the youngest age group (aged 6-15). While effects are apparent for those aged 66 to 75, the association is not as strong, but deprivation still clearly plays a residual role. The effect is diminished for those over 75, probably due to lower mobility for this age group.

About 10% of pedestrian casualties occur at crossings and another 10% on footways or verges. We examine these in more detail, as well as those on refuges (which account for about 0.5% of the total casualties and show no statistically significant association with deprivation). Fatal, serious, and slight injury pedestrian crashes at crossings are statistically significant (all at the 95% levels). What is particularly interesting is that the parameter values are much larger than the model with total pedestrian casualties for fatal and serious injuries, but the coefficient for slight injuries is similar in magnitude. This suggests that the crossings in more deprived areas may be riskier than those in less deprived areas. For pedestrian crashes at footways and verges, we find an association with deprivation for all severity levels. The magnitude of the parameters is less than our results in Table 2 for serious and slight injuries, but substantially more for fatalities. This suggests there may be some residual effect in deprived areas that makes footways and verges more dangerous than in less deprived areas.