

Head injuries to bicyclists and the New Zealand bicycle helmet law

Scuffham P, Alsop J, Cryer C, Langley JD.
Accident Analysis & Prevention, 2000;32,p565-573.

Authors' abstract

The purpose of this study was to examine the effect of helmet wearing and the New Zealand helmet wearing law on serious head injury for cyclists involved in on-road motor vehicle and non-motor vehicle crashes. The study population consisted of three age groups of cyclists (primary school children (ages 5-12 years), secondary school children (ages 13-18 years), and adults (19+ years)) admitted to public hospitals between 1988 and 1996. Data were disaggregated by diagnosis and analysed using negative binomial regression models. Results indicated that there was a positive effect of helmet wearing upon head injury and this effect was relatively consistent across age groups and head injury (diagnosis) types. We conclude that the helmet law has been an effective road safety intervention that has led to a 19% (90% CI: 14, 23%) reduction in head injury to cyclists over its first 3 years.

Methodology notes

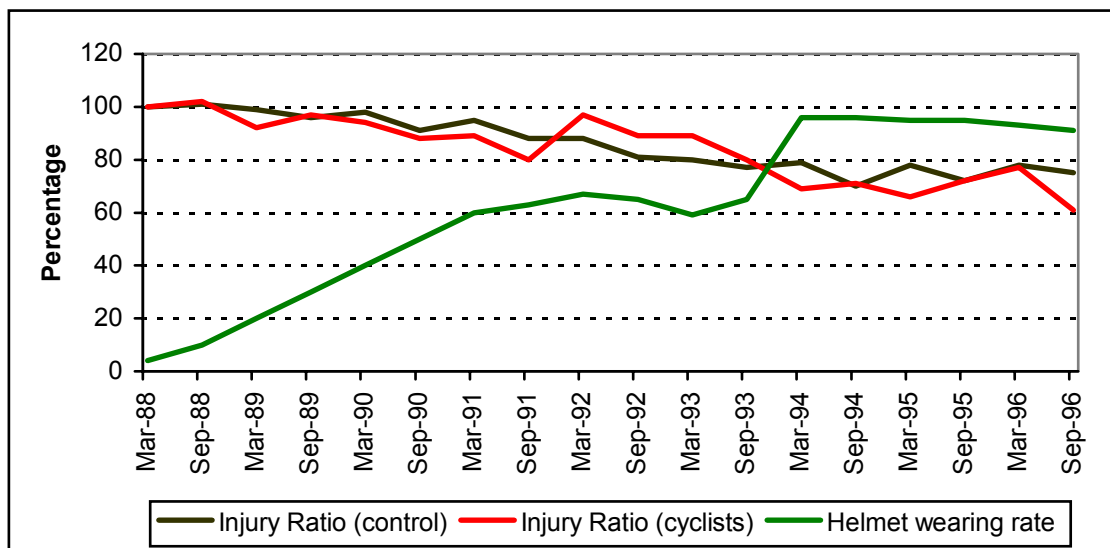
The surveys were based on approx 10,000 cyclists in each of the three age groups. No direct account was taken of exposure (cycle use). The ratio of head injuries to non-head injuries was used as a proxy.

Critique

Scuffham claimed that the NZ law reduced head injuries by 20%, but he included scalp lacerations in the definition of head injury (scalp lacerations are not truly serious head injuries) and he omitted to emphasise that the cyclists head injury trend had drifted well above the control trend before the law, so the law merely returned the cyclist trend to what it would have been without helmets.

Re-analysis by Perry

Nigel Perry¹ obtained the original data from the authors, and produced the following graph directly from this. It shows information not presented in the paper.



The graph shows the change in the ratio of head injuries to all injuries, relative to the reference date, March 1988. This is shown for two groups: cyclists, and a control group of the whole population – motorists, pedestrians, ladder climbers – everyone who sustained an injury. Also shown is the percentage of cyclists wearing helmets. Cycle helmets became mandatory in New Zealand from January 1994.

This graph shows that:

- ◆ The general fall in the likelihood of head injury for cyclists coincides to a high degree with a similar fall in head injury for non-cyclists (who make up the great majority of the whole population control group).
- ◆ There is a fall for cyclists and not the control group when the law was introduced, but the cyclist head injury rate had previously risen above the overall one, and the fall is soon followed by an increase. The cyclist head injury rate does appear to fluctuate a little more than the overall rate.
- ◆ There has been no additional benefit for cyclists through the wearing of helmets that has not been enjoyed by the population as a whole without helmets. This is despite the fact that the survey on which the graph is based included head injuries sustained in simple falls (for which cycle helmets are designed to offer some degree of protection) as well as more serious instances of collisions with motor vehicles.

Cycle use and head injuries

The New Zealand Household Travel Survey² shows that cycling hours decreased by 34% from 1989 to 1997, or approx 22% since the helmet law. This is greater than the 19% reduction in head injuries suggested by Scuffham et al.

Notwithstanding the previous critique, head injuries to cyclists have not fallen by more than the decline in cycle use.

References

- ¹ *The bicycle helmet legislation, curse or cure?* Dr N Perry, University of Canterbury. Presented to Cycling 2001, Christchurch. Paper and source data at <http://www.mondrian-script.org/cycling2001/>
- ² Land Transport Safety Authority. www.ltsa.govt.nz/research/travel_survey/research/travel_survey.html