COMMENTARY

Bicycle helmet legislation for the uptake of helmet use and prevention of head injuries (Review)

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Original paper External Link

Summary of paper (from authors' abstract)

Objective: To assess the effects of bicycle helmet legislation on bicycle-related head injuries and helmet use, and the occurrence of unintended adverse consequences.
Selection criteria: We included studies that reported changes in either the number of head injuries, helmet use or bicycle use post- versus pre-legislation. Only studies that included a concurrent control group and which reported on the effect of legislation implemented at either the country, state or province wide level were included.
Main results: Five studies, all from North America, met the inclusion criteria. For each of the studies, bicycle helmet legislation had been enacted for children only. Adults were used as controls in four of the studies, whilst jurisdictions with no helmet legislation were used as controls in the fifth. Three of the studies reported on changes in head injury rates and three reported on changes in helmet use. There were no included studies reporting change in bicycle use or other adverse consequences of legislation. In two studies, statistically significant decreases in head injuries were reported following the implementation of helmet legislation compared with controls, whilst one reported a non-statistically significant decline. Bicycle helmet use increased statistically significantly post-legislation in all three of the studies reporting on helmet use.
Authors' conclusions: Bicycle helmet legislation appears to be effective in increasing helmet use and decreasing head injury rates in the populations for which it is implemented. However, there are very few high quality evaluative studies that measure these outcomes, and none that reported data on an possible declines in bicycle use.

BHRF Commentary

No evidence of net benefit from helmet laws

This review undertook only two types of analysis. It looked at changes in the absolute number of head injuries to cyclists following helmet laws, and it looked at changes in the proportion of cyclists who wore helmets as a consequence of the laws. Although part of its objective, the review did not assess any unintended adverse consequences of the laws, such as changes in cycle use. None of the studies included in the Cochrane review measured pre- and post-legislation cycling participating rates, **making it impossible for the authors to draw any conclusions about the laws' effect on either cycling or injuries**.

The authors admit these limitations of the review. However, the balance of the authors' presentation does not always reflect the null outcome of the review, for they talk up the possibility of more positive benefits while being much more sceptical of adverse consequences. In this way the review is not free of bias, but suggests benefit when none has been found.

For example, although only two of the three studies that reported on changes in head injury found that there had been a statistically significant reduction in injuries (which is therefore not strong evidence, in so small a sample, that any reduction in the absolute number of head injuries is to be expected), the authors conclude that "Bicycle helmet legislation appears to be effective in … decreasing head injury rates in the populations for which it is implemented". It would have been more honest to acknowledge that the studies had mixed outcomes of benefit in reducing head injuries and that therefore there was no conclusive evidence that helmet laws had achieved this benefit.

Sometimes, too, the method of presenting data could mislead. The word 'rates' is ambiguous in common usage as

it might incorrectly suggest (when referring to a decrease in head injury rates) that there has been proven reduction in risk of injury for cyclists who crashed, whereas the same reduction in head injuries could just as easily have occurred through fewer crashes as a result of less people cycling.

The use of percentages to track head injuries and helmet use is also misleading without reference to the base figures. For example, in Victoria (Australia), one survey showed the law to have increased helmet use from 21% of teenagers to 45%. However, this large increase in percentage helmet wearing had come about through just 30 more teenagers wearing helmets compared with 623 who no longer cycled (Robinson, 1996) .

Limitations of studies reviewed

One of the three studies (Macpherson et al, 2002) used to assess changes in head injury was the work (as principal author) of one of the authors of this review. The potential conflict of interest is acknowledged, but there is no reference to the extensive peer criticism to which this study has been subjected, some of which was published in *Pediatrics*, the journal of origin.

The study compared head injuries of children in Canadian provinces that passed helmet laws with those that did not, but found no reliable evidence that helmet laws were beneficial. Head injury rates in helmet-law provinces were lower than no-law provinces, but the study's data show that non-head injury rates were also lower, perhaps because of reduced cycling. Provinces with helmet laws also had much greater reductions in fatal or serious injuries to pedestrians than those without bicycle helmet laws. Clearly the bicycle helmet laws did not result in the benefits for pedestrians, but it is likely that the factors that led to safer roads for pedestrians also contributed to fewer head injuries to cyclists. Moreover, if helmet laws had been beneficial, the reductions in head injuries should have been related directly to the changes in helmet wearing. This was not, however, the case in Canada. For example, the lowest risk of head injury in Ontario was in 2001/2, six years after the helmet law, and by which time helmet wearing had returned to pre-law levels (Robinson, 2006). *See also:* BHRF commentary on this paper

Exaggerated prologue on risk of head injury when cycling

The authors predispose the reader in favour of helmet wearing and helmet laws by referring to cycling as a "global public health problem" and an activity where "bicycle-related injuries are common and frequently lead to hospitalisation". They offer no justification for these statements and they ignore research that has shown people who cycle regularly to live longer, with less ill health, than people who do not (Andersen, Schnohr, Schroll and Hein, 2000), and data from many sources that suggests that the risk of injury when cycling is much less than for many other common activities (BHRF, 1026).

As justification for their claim that cycle helmets have been shown to be effective in preventing injuries, the authors cite the standard works by Thompson, Rivara & Thompson that have been widely criticised and that are without reflection in the real world (Thompson, Rivara and Thompson, 1996; Thompson, Rivara and Thompson, 2002-9). If helmets are effective in preventing injuries, this should be apparent from a proper analysis of the effects of enforced helmet laws, but the review was unable to show this. Conversely if laws show no such clear benefit, it is unlikely that helmets themselves are anything like as effective as the cited research suggests.

Other insights into law outcomes

Good quality evidence about whether helmet laws deter people from cycling is available simply by asking them! For example, in New South Wales, 51% of schoolchildren owning bikes, who hadnâ€™t cycled in the past week, cited helmet restrictions, substantially more than the numbers citing other reasons, including safety (18%) and parents (20%) (Blacktown). 64% of adult cyclists in Western Australia said they would ride more except for the helmet law (Heathcote and Maisey, 1994). The review does not mention this kind of evidence at all.

A more reliable way of assessing the benefits of helmet laws is to consider jurisdictions with large increases in percent helmet wearing within a year of legislation. This method was applied by Robinson (Robinson, 2006), who found that while helmet laws discourage cycling, they produce no obvious response in the percentage of head injuries.

Ethics

This review raises questions with regard to ethical and moral issues. The principal author is a known campaigner for cycle helmet laws and clearly not neutral in her enthusiasm for them.She is the author of other papers on helmet laws that have been criticised for not presenting a balanced view of the evidence. In this review, although its limitations are acknowledged, the overall presentation is not a good reflection of the null outcome of the review but, arguably, an attempt to present as positive an outcome (in favour of helmet laws) as possible despite the evidence.

The Cochrane Database has a reputation as a reliable research base, but this paper will be seen by many to damage that reputation by allowing use of the Database as a platform for campaigning in favour of a pre-determined point of view instead of sound science.

References

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