The impact of compulsory cycle helmet legislation on cyclist head injuries in New South Wales, Australia: A rejoinder

Chris Rissel

University of Sydney, School of Public Health, Medical Foundation Building K25, Level 2, 92-94 Paramatta Road, Camperdown, NSW 2050, Australia

ARTICLE INFO

Article history:
Received 14 July 2011
Received in revised form 2 November 2011
Accepted 25 November 2011

Keywords:
Cycling
Bicycle helmet legislation
Head injury

ABSTRACT

This paper challenges the conclusion of a recent paper by Walter et al. (Accident Analysis and Prevention 2011, doi:10.1016/j.aap.2011.05.029) reporting that despite numerous data limitations repealing the helmet legislation in Australia could not be justified. This conclusion is not warranted because of the limited time period used in their analysis and the lack of data beyond a few years before the introduction of legislation, the failure to adequately account for the effect of the phasing in of the legislation, the effect of the marked reduction in child cyclists, and the non-comparability of the pedestrian and cycling injuries and related lack of consideration of the severity of head injuries. The extent to which helmet legislation deters people from cycling is discussed.

© 2011 Elsevier Ltd. All rights reserved.

1. Introduction

Mandatory bicycle helmet legislation has been vigorously debated in Australia since its introduction (Finch et al., 1993; Attewell et al., 2001; Robinson, 2006, 2007; Macpherson and Spinks, 2008). While advocates claim there were decreases in the number of head injuries in Australia (Finch et al., 1993), opponents claim that the fewer number of head injuries was a result of the observed reduction in people cycling, and that the main cause of the reduction in cyclist head injuries was the general improvement in safety of the road environment (Robinson, 2006).

In 2010, Voukelatos and Rissel used a new approach to understanding the pattern of cycling head injuries and reported the ratio of head to arm injuries before and after the legislation (Voukelatos and Rissel, 2010). They observed a marked decline in this ratio before the introduction of the mandatory helmet legislation, which then levels out. However, numerical and data graphing errors were identified in the data (Churches, 2010), and despite the corrected data not changing the conclusion that general improvements in road safety led to the observed reductions in head injuries, a correction was not accepted and the paper was retracted by the journal’s editor.

These same NSW data were then reanalysed by Walter et al. (2011). They concluded that “Despite numerous data limitations, we have identified evidence of a positive effect of compulsory cycle helmet legislation on cyclist head injuries at a population level such that repealing the law cannot be justified” (Walter et al., 2011).

Unfortunately, in addition to the “numerous data limitations” there are critical flaws in Walter et al.’s assessment of the data that preclude the conclusion that mandatory bicycle helmet legislation was effective. These include the limited window (36 months) in which the statistical analysis has been focused and the lack of data in New South Wales beyond a few years before the introduction of legislation, the failure to adequately account for the effect of the phasing in of the legislation, the effect of the marked reduction in child cyclists, and the non-comparability of the pedestrian and cycling injuries and related lack of consideration of the severity of head injuries. Each of these points is discussed below.

2. Limited window of analytic focus

To resolve the question of the effectiveness of helmet legislation the analysis should not be susceptible to the particular time window examined. A somewhat arbitrary 18 months before and after the official start of the mandatory helmet legislation was used as the basis of regression modelling, limited by poor quality data prior to the legislation (Olivier, personal communication). Depending on the longer term trends, the regression co-efficient can be dramatically affected. If a slightly longer period had been selected, for example, two or three years, then the background decline (as shown in Walter et al.’s Fig. 1) would significantly reduce any impact of helmet legislation in the regression analyses. It could even be plausibly argued using the data in Walter et al.’s Fig. 1 in alternative regression estimates (as should be conducted in a sensitivity analysis) that the introduction of the legislation halted the decline in head injuries among cyclists. Walter et al.’s Fig. 1 also shows that road casualties for pedestrians, cyclists and motor vehicle...