



Effective Public Health Practice Project Summary Statement

October 2006

This is a summary statement written to condense the work of the authors of a systematic review. The reference for the full review is below. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

Reference for Review: Royal, S.T., Kendrick, D., Coleman, T. (2005). **Non-legislative interventions for the promotion of cycle helmet wearing by children.** *The Cochrane Database of Systematic Reviews 2005, Issue 2.* Art. No.: CD003985.pub2. DOI: 10.1002/14651858.CD003985.pub2.

Issue

In Ontario, the Bike Helmet Law (Bill 124) was passed on July 28, 1993, and came into effect on October 1, 1995 (http://www.toronto.ca/cycling/safety/helmet/helmet_law.htm). Many other Canadian provinces (British Columbia, New Brunswick, Nova Scotia, Alberta and Prince Edward Island) also have bicycle helmet laws. A nationwide study by Macpherson et al. (2002) showed that the bicycle-related head injury rate declined significantly (45% relative reduction) from 1994 to 1998 in provinces that had adopted helmet legislation. Provinces that did not implement legislation saw a 27% reduction during the same time period.

Helmets reduce bicycle-related head and facial injuries for bicyclists of all ages (Thompson et al., 1999). Two Canadian studies found that children from low-income areas were less likely to wear helmets than those from high-income areas and that girls were more likely to wear helmets than boys (Parkin et al., 2003; Harlos et al., 1999).

The Ontario Mandatory Health Programs and Services Guidelines list as an objective a 20% reduction in the rate of injuries caused by cycling crashes and motorized vehicle crashes by the year 2010. They require Boards of Health to work with municipal police, the Ontario Provincial Police, other traffic enforcement agencies and community groups to prevent injuries caused by motorized vehicles and bicycles by supporting policies and educating the public and targeted groups (Ontario Ministry of Health and Long-Term Care, 1997).

Review Content Summary

This systematic review with meta-analysis assessed the effectiveness of non-legislative interventions (education, free or subsidized helmets, or media campaigns) in increasing helmet wearing among children. The reviewers found 22 studies with a range of designs, populations, settings, interventions, follow-up periods and outcome measures. Although observed or self-reported helmet wearing was higher overall in the intervention group than in the control group, there was significant heterogeneity among studies. These results were not confirmed when the analysis was confined to the limited data available from randomized controlled trials (RCT). There

was also heterogeneity in analyses of several subgroups of similar interventions. Although it is likely that non-legislative interventions are effective for promoting helmet wearing in children, it is not possible from this review to determine the most effective type of intervention.

Comments on this Review's Methodology

In addition to searching reference lists specific to bicycle safety and the contents of a key journal, the reviewers searched several health, education, psychosocial and transportation databases. Studies were selected using well-defined criteria. All eligible studies were assessed for quality by two reviewers using two criteria: blinding of outcome assessors and completeness of follow-up; concealment of allocation was also assessed for randomized trials. Data for meta-analysis were available for 17 of 22 studies. Appropriate methods were used to pool data and to assess and investigate heterogeneity. The reviewers adjusted for cluster randomization where it occurred. Nine of 22 studies reviewed were randomized trials but allocation concealment was not reported for any. Four of 12 controlled before-after studies used a population-based design. Outcome assessors do not appear to have been blind to intervention group in any of the studies.

Evidence and Implications for Practice & Policy

Evidence points ARE NOT weighted or ranked according to strength.

What's the evidence?	Implications for practice and policy:
<ul style="list-style-type: none"> > Community-based interventions that include free or subsidized helmets with an educational component increase the use of helmets > These conclusions are based on evidence from a pooled analysis of data from four non-randomized studies (odds ratio [OR] for observed helmet wearing, 4.30; 95% confidence interval [CI], 2.24 to 8.25; N=473). 	<ul style="list-style-type: none"> > Campaigns should include commercial partners that could provide a number of free helmets or a reduction in price. This could involve stores that provide coupons for rebate on the purchase of a helmet. > Education should focus on choosing the correct helmet size, and should also include information on helmet legislation and the safe use of bicycles.
<ul style="list-style-type: none"> > Education alone is not effective. > Pooled data from four studies, including two RCTs, failed to detect a benefit for education alone (OR, 3.08; 95% CI, 0.69 to 13.80; N=379). 	<ul style="list-style-type: none"> > Campaigns that are limited to education are unlikely to change helmet wearing behaviour.
<ul style="list-style-type: none"> > There is some evidence that interventions set in schools may increase helmet wearing. > Pooled analysis of data from six studies failed to detect a statistically significant increase in observed helmet wearing (OR, 1.82; 95% CI, 0.94 to 3.52; N=1935), but six other studies found a significant increase in self-reported helmet use (OR, 4.73; 95% CI, 1.09 to 20.49; N=493) compared to control. In 	<ul style="list-style-type: none"> > Campaigns should be conducted in schools every spring before the beginning of bike season. > These should include bike safety classes with helmet fittings. > Where possible, parents should be included in these interventions.

What's the evidence?	Implications for practice and policy:
both cases, there was significant heterogeneity among studies and a mix of randomized and non-randomized designs.	
> The largest effects were observed in the two studies that included the youngest participants.	> Interventions may be more effective in younger children (3 to 8 years of age).
<p>General Implications: Ontario law requires that children under the age of 18 wear a bike helmet. Public Health should participate in interventions to ensure that everyone knows the law. Partnerships should be developed between the education and health sectors and stores in order to provide helmets to children free or at a reduced cost. Public health and education personnel should collaborate on effective strategies to prevent children from coming to school on their bikes without their helmets and to ensure that helmets fit correctly.</p>	

Cost Benefit or Cost-Effectiveness Information: Not included in the review.

References Used to Outline Issue

- Harlos, S., Warda, L., Buchan, N., Klassen, T.P., Koop, V.L., & Moffatt, M.E. (1999). Urban and rural patterns of bicycle helmet use: factors predicting usage. *Injury Prevention*, 5, 183-188.
- Macpherson, A. K., To, T. M., Macarthur, C., Chipman, M. L., Wright, J. G., & Parkin, P. C. (2002). Impact of mandatory helmet legislation on bicycle-related head injuries in children: A population-based study. *Pediatrics*, 110 (5) e60.
- Thompson, D.C., Rivara, F.P. & Thompson, R. (1999). Helmets for preventing head and facial injuries in bicyclists. *Cochrane Database of Systematic Reviews 1999 (4)*. Art. No.: CD001855. DOI: 10.1002/14651858.CD001855.
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- Parkin, P.C., Khambalia, A., Kmet, L., & Macarthur, C. (2003). Influence of socioeconomic status on the effectiveness of bicycle helmet legislation for children: a prospective observational study. *Pediatrics*, 112 (3:1), e192-6

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