Butting heads over bicycle helmets

Although the need for bicycle helmet legislation was recently questioned in *CMAJ*,[1] the question of whether helmets are being properly strapped on remains unanswered.[2] How many adults — and even more children — wear their helmets either unstrapped or poorly strapped and hanging loosely over their occipital areas? An improperly strapped helmet is worse than worthless: it conveys a false sense of being protected.

Wilhelm Kreyes
Retired Physician
Winnipeg, Man.

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Ten years after publishing an article in *CMAJ*[1] about the negative implications of bicycle helmet legislation, I continue to be dumbfounded by the broad consensus within our profession in favour of such laws.[2]

A fundamental problem with emphasizing and legislating helmet use is that it reinforces the popular misconception that road bicycling is dangerous. The predictable result of such a message is decreased ridership, as Mary Chipman astutely warns.[3] Thanks to superior cardiovascular fitness, the average cyclist outlives the average noncyclist, helmet or no helmet.[4] Ultimately, helmet laws save a few brains but destroy many hearts.

Observations in several countries over the past 30 years have demonstrated how road cycling safety is consistently related to the numbers of riders.[5] The converse is also true: individual risk rises as ridership declines, a pattern well documented in the US over the past decade. As helmet laws there have become widespread, and as road cycling has become less popular, the rate of injury per active cyclist has risen by 50%.[6]

Fatal cyclist head injuries represent far less than 10% of all road-related deaths. Instead of fixating on protection for a small minority of road users, why don't physicians champion prevention of crashes and support measures that make roads safer for everyone? A priority should be to lower urban speed limits, especially on residential streets where traffic-calming devices should be standard. We should also support the elimination of all free parking, both public and commercial. By reducing both the speed and convenience of driving, we'd instantly witness dramatic declines in fatalities and everyone would benefit from model shifts to healthier, safer and more environmentally friendly forms of transport, such as walking, bicycling and public transit.

Thomas J. DeMarco
Physician
Whistler, BC

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The data presented by LeBlanc and colleagues[1] show that the risk of head injury per cyclist did not change as a result of the law, but rather the risk of other injuries approximately doubled. Their bicycle count data show a 40%–60% fall in the number of cyclists after the law was passed, from 88 per day down to 33 or 52 per day. Their injury data show a sharp fall in total injuries in 1997, but for 1998/99 the number of injuries was higher than before the law (443 v. 416). The absolute number of head injuries has fallen by half, but so has the number of cyclists, although the total number of injuries has increased. Likewise, the claim of a doubling in the rate of helmet use omits the more telling point that the absolute number of cyclists using helmets did not materially change.

The Nova Scotia helmet law experience strengthens the arguments against helmet laws. No reduction has occurred in the risk of head injury per cyclist, relative to this study's loose definition of head injury. However, a big increase has occurred in the risk of non-head injury per cyclist. Further-

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more, there has been no material increase in the number of helmeted cyclists. Rather, cycling on a substantial scale has been deterred. The deterrence of the safest mode of urban transport will not contribute to overall road safety or public health.

Utility cycling is a low-risk activity. Although cyclists in Great Britain do not have a notably good safety record, the expectation for a fatal crash for the average cyclist is only once in 18 000 years (3 million regular cyclists, 165 deaths per year). Experience shows that strong helmet promotion or laws bring about a low-utility, high-injury cycling culture. In countries such as France, the Netherlands and Denmark, little interest is shown in helmets, despite high levels of utility cycling and much better safety records. Cycling is very safe where it is popular.[2] In France and Denmark, an hour of cycling is much safer than an hour of driving.[3] In all countries for which I have seen data, pedestrians are more at risk than cyclists.[4,5]

Research here in Great Britain by the Transport Research Laboratory shows that the public relates helmets and their promotion to danger, and this deters cycling.[6] As the relevant report comments, "Fear of traffic peril is a huge deterrent, though fear usually exceeds true danger. Discussion of safety frequently sharpens fear and so deters cycling." The report observes that local authorities who ran prominent helmet campaigns saw a sharp drop in cycling activity.

The British Medical Association reviewed the question of a national helmet law in 1999 and concluded that helmets should not be made compulsory anywhere in Great Britain.[7] This decision recognizes real-world experience in countries where helmets have come into general use, but little, if any, benefit has been observed in time trends of serious injuries.[8] Injuries may even have increased.[9] It is clear that a helmet will not prevent death in a serious crash with a motor vehicle.

Malcolm Wardlaw
Transport Safety Analyst
Glasgow, UK

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[One of the authors of the research article responds:]

In her editorial,[1] Mary Chipman states that the introduction of bicycle helmet legislation in Nova Scotia may have reduced cycling activity and the proportion of child cyclists[2] (see Table 1 of her article). However, our study design precludes drawing this conclusion. We sought to maximize the number of cyclists observed in a fixed observation period. Due to availability of observers, we could not standardize observation times from year to year. Not surprisingly, we observed large variations in the number of cyclists per unit time, depending on the time of day, the day of the week, or the month. For example, during 1998 and 1999 we collected data almost exclusively during weekdays, which largely reflected adult commuter traffic. These variations in collection methods are a far more plausible explanation for the variation in cycling rates and proportion of child cyclists than the legislation. In support of this view, the owners of 3 major Halifax bicycle shops informed me that although bicycle helmet sales surged after the introduction of the legislation, there was no reduction in the sale of bicycles and no discernable impact on cycling activity.

Chipman refers to an Australian report by Dorothy Robinson[3] that revealed cycling by children under 12 fell by 36% after the introduction of helmet legislation. However, Robinson did not discuss whether the decline persisted or whether those who stopped cycling substituted other equally beneficial activities. Chipman did not cite the study conducted by her colleagues who directly assessed the impact of helmet legislation on cycling behaviour in Toronto.[4] They found that the rate of child cyclists before and after the introduction of bicycle helmet legislation actually increased from 4.3 cyclists per hour in the preceding year to 6.8 cyclists per hour in the year following the introduction of a law similar to the Nova Scotia legislation.

Wilhelm Kreyes raises important points about the influence of correct use of helmets on their effectiveness. Incorrect size, orientation or misuse of buckles undoubtedly reduce a helmet's ability to protect from injury. However, a proper assessment of these elements would necessitate a different study design.

Thomas DeMarco continues to be dumbfounded by the widespread support of the medical profession for helmet legislation. Without offering any evidence, he concludes that "ultimately, helmet laws save a few brains but destroy many hearts." Such a conclusion cannot be drawn without knowing about the habits of those who abandoned cycling, and what activities if any they substituted in their quest for freedom from the burden of helmets.

Finally, based on calculations not warranted by our study design, Malcolm Wardlaw comes to the remarkable conclusion that cycling activity in Halifax has been cut in half. In addition, he ignores published literature that shows cycling rates continue to increase after the introduction of legislation[4] as well as accumulating evidence, summarized in a Cochrane review[5] and a subsequent able defence against its critics,[6] that has already shown that helmets are effective in preventing head injuries. This evidence cannot be dismissed by inappropriate secondary analysis of our data.