

Legislation

# Cycle helmets

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## Time for legislation

Few people are in any doubt that cycling has enormous health benefit to children, especially when there are increasing concerns among health professionals about the sedentary lifestyle of children and the impact such inactivity has on the incidence of obesity, type 2 diabetes, and other adverse health outcomes.<sup>1,2</sup> Cycling is a useful form of regular exercise, but this activity must be carried out safely with measures to minimise the risk of injury. Many injuries sustained by children from bicycle accidents arise from loss of attention or poor coordination; others are caused by failure to avoid obstacles such as drains, or undertaking stunts.

Each year more than 50 young people aged 15 years and under are killed in cycling related accidents, with 70–80% of these deaths caused by traumatic brain injury.<sup>3</sup> The evidence suggests that children are at greater risk to head injury than adults.<sup>4</sup> Hospital based figures show that more than 100 000 British children each year are injured in cycling accidents, although many of these are relatively minor injuries that do not require hospital admission.<sup>5</sup> Approximately 1000 children a year receive a moderate or severe brain injury from cycle accidents that leads to permanent neurological disability with problems such as cerebral palsy, epilepsy, or significant learning difficulties which will affect education, everyday living, and quality of life.<sup>6</sup>

### THE EVIDENCE ON THE BENEFIT OF WEARING CYCLE HELMETS

Clearly there is a major role for important measures such as cycle lanes, vehicle speed reduction measures, and driver education, all of which act as primary prevention measures to reduce the incidence of cycle accidents. However, when dealing with child cyclists, observation studies have shown that

85% of accidents occur “off road” on pavements, tracks, cycle lanes, and elsewhere, with only 2% of all hospital treated casualties having had an accident involving another vehicle.<sup>7</sup>

The possibility of secondary prevention of brain injury by wearing cycle helmets has been looked at in a 30 month study of 3854 cyclists treated in an emergency room setting in seven hospitals in the USA.<sup>8</sup> The study showed that helmet usage decreased the overall risk of brain injury by 65% and severe brain injury by 74%. The authors additionally concluded that if they had been able to use population controls in the study the overall protectiveness rate would have been 85% for head injury and 88% for brain injury. Helmets worked equally well in all age groups, and were equally effective in protecting cyclists in both crashes involving motor vehicles and those not involving cars.<sup>8</sup> Furthermore, this and other studies have shown substantial protection against lacerations and fractures to the upper and mid face.<sup>9</sup>

Although case-control studies are seen as a reliable method for analysing effectiveness and outcomes, there has recently been debate into the methodology of individual papers that aims to detract from robust studies which clearly show helmet effectiveness. The most recent paper by Attewell and colleagues<sup>10</sup> has taken peer reviewed studies with helmet use data and cyclists injury data from a number of internationally published papers between 1987 and 1998 and used them as part of a 16 paper meta-analysis study. This study showed that cyclists in various settings, including those involved in a motor vehicle impact, would have significantly benefited from the bicycle helmets in reducing head injury risk. The study showed that helmets were effective in reducing all injury levels to the

brain; those who died would have survived if a helmet had been worn.

### THE READING EXPERIENCE

In 1992 an education programme was set up in Reading to encourage cycle helmet wearing among children and teenagers; usage rates locally went up from 18% to 60%.<sup>11</sup> This original study showed that up to around 50% of children could be encouraged to wear helmets, with a concurrent large reduction in hospital visits for cycle related accidents. Following the setting up of a charity in 1998—the Bicycle Helmet Initiative Trust (BHIT)—a number of pilot zones were set up in various sites in England, including Southampton and Derby; these have also led to an increased rate of cycle helmet usage in children. Such campaigns have required a dedicated health care professional with access to local schools to coordinate activities. It is clear in all this work that the most difficult group to get to wear helmets consistently are teenagers who may be subject to peer pressure. Factors such as helmet design and colour as well as peer pressure are important to take into account if uptake is to be improved. Many schools have programmes of compulsory helmet wearing to and from school. These, when combined with active input, such as providing lockers for storage and education at school, tend to put helmet wearing rates up above the critical mass necessary for acceptance among the peer group.<sup>12</sup>

### THE OVERSEAS EXPERIENCE

Cycle helmets are compulsory in Australia, New Zealand, Spain, Iceland (aged under 16 years), the Czech Republic (aged under 16 years), and Canada (aged under 18 years) as well as within 20 states in the USA; these countries have decided to institute specific legislation to optimise helmet usage. Research from New Zealand and Canada suggests that high usage rates have resulted from this policy, with an associated reduction in cycle related deaths and head injuries.<sup>13</sup> Although there were initial concerns about a reduction of cycle usage initially in Australia,<sup>14</sup> a study from Ontario, Canada has suggested that introduction of helmet legislation there has not reduced numbers of children cycling.<sup>15</sup>

### WHY LEGISLATION?

The initiatives led by BHIT in the United Kingdom have shown that education alone is not adequate to prevent the majority of brain injuries in children who cycle, as maximum wearing rates of only 60% have been achieved.<sup>11</sup> Legislation has been effective in a number of other countries where wearing rates significant rose following legislation<sup>13</sup>; the benefit has been most significant among

**Table 1** Level of helmet wearing among children pre- and post-legislation

Country	Pre-legislation	Post-legislation
Victoria, Australia, aged 5–17 years	43% (1990)	68% (1992)
British Columbia, Canada, aged 6–15 years	35% (1995)	61% (1999)
New Zealand, aged 5–18 years	11% (1986)	73% (1994)

Source: Department of Transport Report No. 30, Bicycle helmets—a review of their effectiveness (2002).

children (table 1). Britain is now lagging seriously behind many countries with this safety issue. The study in Reading<sup>11</sup> has shown that it is difficult to achieve very high rates of usage by education alone; however, increased publicity from a national advertising campaign may be helpful. Legislation will be needed, combined with methods of law enforcement—police and traffic wardens could be active in this area.<sup>16</sup> Schools will also have a role in ensuring that all children cycling to and from school own a helmet and are seen to wear it in the vicinity of the school. Although it is assumed that making helmets mandatory is controversial, when this legislative concept was put to teenagers themselves, a positive attitude to mandatory helmet use was seen: 55–58% favoured law enforcement, viewing it as one of the most important reasons for deciding whether to wear a helmet.<sup>12 17–19</sup>

Finally, it should be noted that this is an advocacy area for paediatricians, and accident prevention should be seen as a priority for all of us. If government legislation is to come in soon, then support from all organisations that have an interest in child safety and health is essential.

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