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## War on the roads

*The public health community must intervene*

**T**he last thing the world needs is another war. Nevertheless, this week the *BMJ* exposes one more—the war on the world's roads. But to what extent can the global road trauma epidemic be likened to war?

War is often waged by the powerful on the weak. In this case, the interests of pedestrians, cyclists, and other vulnerable road users are pitted against the powers that stand to profit from increasing global motorisation. And there are many millions of casualties. Every day about 3000 people die and 30 000 people are seriously injured on the world's roads.<sup>1</sup> In this issue Nantulya and Reich point out that over 85% of the deaths and 90% of disability adjusted life years lost from road traffic injuries are in low and middle income countries, with pedestrians, cyclists, and bus passengers bearing most of the burden.<sup>2</sup> Most of the victims will never own a car, and many are children. Even in the high income countries, poor children are at greatest risk. The existence of a steep social class gradient in mortality in child pedestrians is well documented, but the evidence about socioeconomic gradients in morbidity due to injury has been conflicting.<sup>3</sup> This week Hippisley-Cox and colleagues report a study of over 56 000 admissions of injured children to hospitals in Trent that provides clear evidence of a social class gradient in morbidity from injury, and which is steepest for injuries in pedestrians.<sup>4</sup> Nevertheless, the prevention of traffic crashes is low on the list of public health priorities both in the United Kingdom and internationally, with record low levels of funding in research and development.<sup>5</sup>

As in other wars, propaganda is an important weapon. It is not in the interests of those who sell road transport to allow the private trouble of road death and injury to become a public issue. The idea that governments and the motor manufacturing industry have a major responsibility is not for public consumption. It is much more acceptable that the victims are held responsible. In this issue, Roger Browning, a trustee of the victims' charity RoadPeace, writes about the loss of his daughter in a road crash and his frustration at the absence of an appropriate response from the relevant authorities, including the medical profession.<sup>6</sup> According to Marcel Haegi, the president of the European Federation of Road Traffic Victims, the failure of governments to properly enforce road safety laws, and to investigate road deaths as they would other situations involving the taking of life, is commonplace.<sup>7</sup>

The current preoccupation with educational programmes for pedestrians and road safety awareness campaigns might be another example of road safety propaganda. For example, writing on injuries in child pedestrians in low income countries, the Global Road Safety Partnership (led by the World Bank) argues that one reason why these accidents happen is that children do not have the necessary knowledge and skills that allow them to deal with the hostile traffic environment.<sup>8</sup> On the basis of their systematic review of controlled trials of pedestrian education programmes, however, Duperrex and colleagues point out that there is no evidence that education programmes for pedestrians reduce the risk of motor vehicle collisions involving child pedestrians, and no trials have been conducted in low and middle income countries.<sup>9</sup> But research in biomechanics has shown that changes in the design of vehicles could greatly reduce the frequency and severity of pedestrian injuries.<sup>10</sup> Indeed, if vehicles complied with the recommendations of the European Enhanced Vehicle Safety Committee (EEVC), the estimated reductions in deaths among pedestrians could exceed 20%. The motor manufacturing industry vigorously opposes the introduction of this committee's recommendations for safety tests to benefit pedestrians. Trucks and buses hit a large number of pedestrians and bicyclists around the world, and it is possible to make the fronts of these vehicles safer.<sup>1</sup> At present this issue is not on the agenda of any manufacturer or official safety agency.

How can we end the war on the roads? Contributors in this theme issue offer a range of strategies. Firstly, health practitioners must join forces with victims' organisations to build broad based coalitions advocating improved prevention and better care for road victims.<sup>7</sup> In particular, Coates and Davies highlight the need for more research and better training of doctors in prehospital trauma care.<sup>11</sup> Secondly, we must counter propaganda by insisting on research based countermeasures, including those specifically tailored to local traffic conditions in low and middle income countries.<sup>12</sup> O'Neill and Mohan call for national or regional road safety agencies staffed with trained professionals.<sup>12</sup>

By 2020 road traffic crashes will have moved from ninth to third place in the world ranking of the burden of disease and will be second place in developing countries. Connor and colleagues in New Zealand show that sleepiness among drivers may account for nearly a fifth of road traffic crashes.<sup>13</sup> Similarly, if the international public health community continues to

sleep through the global road trauma pandemic it will be accountable for many millions of avoidable deaths and injuries.

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## Ensuring the safety of school age passengers

*Booster seats are necessary for optimal protection*

The article by Halman et al (p 1123) in this issue indicates that children of school age involved in motor vehicle crashes were less severely injured if they were wearing a seat belt, irrespective of the type of restraint or seating position in the motor vehicle.<sup>1</sup> The authors report that school age children (4-14 years old) restrained with a seat belt were 2-10 times as safe as unbelted children and were at least as well protected as adults wearing seat belts. The findings, however, do not answer the question about whether the degree of protection afforded children by standard seat belts is sufficient, according to the authors' discussion of the limitations of the data. The national safe kids campaign in the United States and the child passenger safety community recommend that children be protected in an appropriate child restraint or booster seat rather than in a safety belt at least up to the age of 8 years. Premature graduation to a safety belt from a forward facing child safety seat is potentially dangerous.

Booster seats lift a child up and make the adult safety belt fit correctly. These seats position the lap belt low over the upper thigh (not riding on the abdomen) and the shoulder belt snug across the center of the shoulder (not crossing the neck or face). They also allow a child to sit back against the vehicle seat with knees bent comfortably, ensuring that correct positioning of the belt is maintained. Booster seats—either with a high back when the vehicle does not provide head support, or backless—are recommended as a transition from child restraints with harnesses (usually limited to 40 pounds or 18 kg) to the time that adult belts fit properly (around the age of 8 years). Adult safety belts fit children properly only when their knees bend over the seat while they sit as far back as possible without slouching; the shoulder belt fits snugly across the chest and the centre of the shoulder; and the lap belt fits low across the upper thighs.

Failure to use a booster seat in a crash can result in seat belt syndrome, a pattern of intra-abdominal and

spinal injuries caused by the improper fit of seat belts.<sup>2</sup> Recent data from the crash injury research and engineering network indicate that children inappropriately restrained in a seat belt are nearly three and a half times as likely to suffer a severe injury than their peers appropriately restrained in a booster seat.<sup>3</sup> Broken jaws and noses are among other less severe, but usually disfiguring, consequences of premature use of safety belts among children of school age.

Use of booster seats among children aged 4-8 has increased in recent years, especially among the youngest children. Among 4 year olds, use of booster seats increased from 14% in 1998 to 34% in 2000.<sup>4</sup> Yet placing children in the correct seat for their age and size continues to be a challenge. According to an observational interactive study of over 9300 children in nearly 6300 cars, more than 63% of children who should have been in belt positioning booster seats were inappropriately restrained, most often in adult safety belts.<sup>5</sup>

Although it is true that safety belts are better than no restraint at all, parents should be encouraged to provide the optimal level of protection for their children of school age. The strategy for improving the use of booster seats is multifaceted and well understood by safety advocates in the United States and other nations.

One highly effective measure is to close gaps in existing laws for the protection of child occupants. In 2001 the national safe kids campaign analysed such laws throughout the United States and rated them woefully lacking.<sup>6</sup> Since then, at least 10 states have improved their laws protecting child occupants in some fashion, and an additional 23 states have introduced improvement bills, although only six of these specifically legislate booster seats; all aim to close gaps requiring restraints for older, "forgotten," children.

Other recommended techniques include informing parents better about the importance of correct and consistent use of booster seats, continuing targeted outreach to populations at risk by using culturally

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