Bicycle helmet protection for children

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Annually 250 road fatalities are registered in Slovenia. Even though the Slovenian road fatalities dropped strongly in the last years, this is above the European average with 84 fatalities per million inhabitants for 2009. These statistics include all modes of transport. 15% of these annual road fatalities are cyclists, of which 7% are younger than 15 years of age. This indicates that cycling brings a certain risk along, as is the case for virtually any activity, but that these risks certainly do no weigh up against the benefits. Among the benefits of cycling (compared to car driving) are, increased health, reduced traffic congestion, and reduced pollution. A cyclist has relatively little safety options of which a helmet is the most obvious. Bicycle helmets are effective for children, whereas their effectiveness for adults remains unclear.

When considering children in traffic it should be realized that children are not similarly develop as adults. Although obvious, this is often overlooked. The visual development relevant to traffic participation of children is only completed after about 12 years of age. Auditory development can take even longer, e.g., at an age of 15 it takes considerably longer to identify the source of noise compared to an adult. After the age of 14, children develop full concentration skills as well as an accurate and realistic map of the surrounding. In addition, does the smaller size of a child, with similar cycling speed as adults, make children more difficult to spot for other road users. Finally, skills come with practice, which is another important difference between children and adults in traffic.

Bicycle helmets are effective in reducing impact energy. However, after a sharp increase in law-enforced helmet use, no reduction is observed in head injuries for adults. Thus, it appears that with an increased helmet usage also other factors change. Such factors could be risk taking behavior of the adult cyclist as well as lower margins of safety towards adult cyclist by car drivers. On the contrary, helmets for children are mostly found to be effective at the level of a society. Different studies have reported a reduction in head injuries with 18%. In Slovenia children aged < 16 years are obliged to wear a helmet while cycling. Unfortunately, it is unclear how many children wear a helmet.

There are several factors known to influence helmet use, a first group of such factors are injunctive and descriptive norms. An example of the first is to tell a child he or she has to wear a helmet but not to wear a helmet yourself, in the latter case no advises would be given, but a parent or role model wears a helmet. Especially a combination of both is effective in increasing helmet us among children. Legislation is another manner of increasing helmet use, studies report different levels of

effectiveness, but a helmet use increase of around 10% is common. Finally, campaigns have been found to increase helmet use. Unfortunately, it is difficult to pinpoint a common parameter(s) of successful campaigns and what the long term effectiveness is of such programs.

In conclusion, cycling is relatively safe, but helmet use among children can make cycling even safer. A descriptive and injunctive approach is efficient in increasing helmet use among children. In such approach parents and role models wear helmets themselves and recommend children to wear a helmet. However, it should be noted that the effectiveness of helmets is strongly reduced is they are not worn properly and that a helmet should always meet requirements defined in commonly used impact standards. Open question associated with helmet use are (i) if they reduce the use of cycling as a mode of transport, and (ii) if helmet wearing increases risk-taking behavior.