Bicycle Helmet Wearing in a Sample of Urban Disadvantaged Primary School Children

MB Quirke 1,2, S McGilloway 1, CM Comiskey 1,2, CM Wynne 1,2, K O’Sullivan 1, E Hollywood 2
1Department of Psychology, National University of Ireland, Maynooth, Co Kildare
2School of Nursing and Midwifery, Trinity College Dublin, Dublin 2

Abstract
Bicycle helmet wearing is currently not legally enforced in Ireland and little is known about the self-reported practice amongst young children. The principal aim of this study was to assess self-reported helmet wearing amongst a sample (n=314) of primary school children (aged 8-13 years) attending disadvantaged schools in Dublin. Approximately 86% of the sample owned a bike and provided a response to the question on helmet use. The findings indicate that helmet wearing is not a widespread practice (50.4%; 136/270 report never wearing helmets). As children get older, reported practice is also less likely with 67% (2740) of 12/13 year-olds compared to 38% (31/81) of 8/9 year-olds reporting never wearing protective headgear. Regardless of age, more girls (61%; 82/135) than boys (39%; 52/135) indicated always/sometimes using helmets when cycling. Conversely, the findings show that (mandatory) seatbelt wearing is standard practice for the majority (93%; 252/270). The findings relating to helmet wearing add further to the debate around the mandatory introduction of protective headgear for cyclists.

Introduction
The UK Department of Transport identified that, in 2008, 115 pedal cyclists were killed and 2,450 seriously injured on roads in Britain. In the Republic of Ireland, 7 road bicycle deaths were recorded during the same year whilst, according to a Health Service Executive report, an approximate average of 263 cyclists were admitted annually to hospital with accident related injuries during 2005-2008. Hospital costs for these cases have been estimated at over one million euro per year. According to Elke and Elvik, children under fifteen are at greatest risk of serious injury through cycling-related accidents. At present, however, there is no regulatory enforcement of helmet wearing for cyclists of any age in the Republic of Ireland.

There is ongoing debate about the effectiveness of helmet wearing in reducing the risk of head injuries amongst children. In the Republic of Ireland, several medical and safety organisations have consistently argued for compulsory protective headgear. For example, the Irish Medical Council argues that mandatory usage can reduce the incidence of bicycle-related head injuries whilst the Irish Road Safety Authority also promotes the use of bike helmets by all cyclists. To support their position, the RSA, which conclude that wearing a helmet may reduce the risk of head injury by 69%-85%. Furthermore, a more recent review of the literature by the UK Department of Transport, presents evidence from two well known, albeit now dated, studies which suggest that helmet wearing is two to three times more effective at reducing the risk of head injury in young cyclists. Consequently, the overall, the use of properly fitted and correctly used helmets is expected to be effective at reducing the risk of head injury, in particular cranium fracture, scalp injury and intracranial (brain) injury (p1). However, other recent research suggests that no association between bicycle helmet wearing and risk reduction may not be so clear-cut. Many cycling associations argue strenuously that, where such laws have been introduced, they have not been proven to reduce head injuries, but may instead merely reduce the number of cyclists on the road.

Methods
Participants were aged 8-13 years (mean=10.27, standard deviation=1.23) and 48% were female. A little over 86% (271/314) indicated that they owned a bike and of these 270 provided a response to the question on helmet wearing. More than one in four of the sample (28%; 76/270) reported always wearing a helmet compared to 28% (75/270) who indicated that they only did so some of the time. However, half (136/270) reported never using protective headgear when cycling. More than one third (38%, 103/270) reported cycling more than three times a week although a little less than 1/3 (86%, 231/270) cycled less than once a week. Chi-square analysis indicated no significant association between frequency of cycling and reported helmet wearing (c2(2, n=268), p=0.46, phi=0.07). Comparisons across age groups indicated that older children were less likely to report wearing a bike helmet. For example, approximately two-thirds (67%, 2740) of 12-13 year-olds reported never wearing a helmet compared to 38% (31/81) of 8-9 year-olds (Figure 1). Chi-square analysis revealed that this proportional change differed significantly across age groups (x2(2, n=270) = 40.79, p<0.001) and was therefore able to distinguish between those who did/did not wear a bicycle helmet. The model as a whole explained 26% of the variance in helmet wearing, and correctly used helmets is expected to “be effective at reducing the risk of head injury, in particular cranium fracture, scalp injury and intracranial (brain) injury (p1). However, other recent research suggests that any association between bicycle helmet wearing and risk reduction may not be so clear-cut.

Results
Questions relevant to the current study were extracted and data were analysed using PASW. Participants were aged 8-13 years (mean=10.27, standard deviation=1.23) and 48% were female. A little over 86% (271/314) indicated that they owned a bike and of these 270 provided a response to the question on helmet wearing. More than one in four of the sample (28%; 76/270) reported always wearing a helmet compared to 28% (75/270) who indicated that they only did so some of the time. However, half (136/270) reported never using protective headgear when cycling. More than one third (38%, 103/270) reported cycling more than three times a week although a little less than 1/3 (86%, 231/270) cycled less than once a week. Chi-square analysis indicated no significant association between frequency of cycling and reported helmet wearing (c2(2, n=268), p=0.46, phi=0.07). Comparisons across age groups indicated that older children were less likely to report wearing a bike helmet. For example, approximately two-thirds (67%, 2740) of 12-13 year-olds reported never wearing a helmet compared to 38% (31/81) of 8-9 year-olds (Figure 1). Chi-square analysis revealed that this proportional change differed significantly across age groups (x2(2, n=270) = 40.79, p<0.001) and was therefore able to distinguish between those who did/did not wear a bicycle helmet. The model as a whole explained 26% of the variance in helmet wearing, and correctly used helmets is expected to “be effective at reducing the risk of head injury, in particular cranium fracture, scalp injury and intracranial (brain) injury (p1). However, other recent research suggests that any association between bicycle helmet wearing and risk reduction may not be so clear-cut.

The responses to a similar question on seatbelt-wearing showed, by contrast, that 93% (252/270) reported that they always wore a seatbelt whilst only one child said that they never wore a seatbelt when in the car. No differences emerged between genders or across age groups. A direct logistic regression analysis was conducted to assess the relationship, if any, between wearing a bicycle helmet (yes or no) and several possible predictors or risk factors including: age; gender; frequency of cycling; frequency of seat belt wearing; and a measure of parental support as measured from the Kidscreen-27. The model was statistically significant (c2(9, n=268) = 40.79, p<0.001) and was therefore able to distinguish between those who did/did not wear a bicycle helmet. The model as a whole explained 26% of the variance in helmet wearing, and correctly used helmets is expected to “be effective at reducing the risk of head injury, in particular cranium fracture, scalp injury and intracranial (brain) injury (p1). However, other recent research suggests that any association between bicycle helmet wearing and risk reduction may not be so clear-cut.

Figure 1: Proportion of children by age group who reported wearing a bicycle helmet

Bicycle Helmet Wearing in a Sample of Urban Disadvantaged Primary School Children
The findings indicate that helmet wearing is not a widespread practice whilst children are also less likely to report wearing bicycle helmets when they are in school mode of travel. Females are more likely to report wearing protective headgear. Conversely, the data show that seatbelt wearing is standard practice for the vast majority regardless of age. Few, if any, are not wearing any form of bicycle helmet whilst younger children aged 6-12 years. A review of bicycle safety data in Norway during 2006 found that approximately 63% of children under 12 years wore helmets when cycling compared with approximately half of the current sample (who reported always or sometimes wearing one). How this Norwegian research, indicate a much higher prevalence of helmet wearing amongst children under 12 years when compared to a 2002 Irish study which examined reported use by children aged 10-17 years.

This National Health and Lifestyle Survey (NHLS) report14 indicated that only 8% of the respondents (n=5712) were reported wearing bicycle helmets. Similarly, the UK Department of Transport in 2009 estimated a practice rate on major roads of approximately 7-16% which, whilst higher than the NHLS study, is much lower than found amongst the sample in the current study. Excluding Helmets showed that, as children get older, helmet wearing decreased from almost two-thirds of 5 to 11-year-olds to one quarter of 12 to 17-year-olds. This is comparable to the pattern of decline identified in the current study where the proportions of helmet wearers reduced from 62% of 8-9-year-olds to approximately one third of 12-year-olds. A similar inverse pattern, albeit based on a much lower reported practice overall, emerged in the National Health and Lifestyle survey where helmet wearing decreased from 14% of 10 to 11-year-olds to only 5% of 17-year-olds. It is reassuring to note that reported seatbelt wearing in the current study is much higher than the 80% of primary school-aged children estimated by the Road Safety Authority to wear a seatbelt. Indeed, the current findings are more consistent with Irish study by the Department of the Environment where 96% of children were found to wear seat restraints.

This study was conducted as part of a larger evaluation of a health promotion initiative in seven schools located in Dublin. The study is exploratory and has several limitations. Firstly, there may be a number of reasons for the low level of reported practice of helmet wearing. Sample for example, the children who were at the schools located in areas characterised by high levels of disadvantage. Thus, factors such as cost (or availability) may have impacted the practice of helmet wearing. This issue supports the concern from some quarters, that the mandatory enforcement of protective measures put in place by the number of cyclists rather than the use of bicycle helmets agencies have attempted to address these difficulties by introducing subsidised, or free, bicycle helmets. The use of self-report measures in the current study raises questions about social desirability. For example, an interesting study by Schieber & Sacks examined both observed and reported practice from the Oregon Behavioural Risk Factor Survey that children were less likely to report always wearing a helmet (15%) than when observed directly (at 20%). However, whilst different absolute estimates were recorded, across time, similar degrees of change were also found. Social desirability is a legitimate concern in any self-report study. However, using different modes of helmet use may support the view that there is an increased awareness of the importance of seatbelt wearing in cars and perhaps a lower level of social pressure regarding the practice of wearing a bicycle helmet. In addition to examining other possible predictors influencing helmet use, future research could also explore further the differences in legislated safety versus voluntary practices among children to identify whether seatbelt and bicycle helmet use are comparable and if mandatory enforcement underpins differences in reported practice.

It has been acknowledged that helmets are only useful if headgear is of high standards and is worn correctly. Helmets have also been found to only protect from certain types of direct impact head injuries and hence, their limitations also need to be acknowledged. Prior to the introduction of such schemes to support mandatory wearing, proponents of both sides of the debate have argued that cost/benefit analysis would provide a useful tool for policymakers to determine the effectiveness of introducing such legislation in Ireland, helmet wearing is promoted by both the RSA and the IMO as good cycle-safety practice and it is worthy noting, in this context, that cycling helmets have just been included as a new addition to the list of goods used to compile its new five-yearly Consumer Price Index. This would appear to indicate that consumers/cyclists are indeed changing their cycle safety practices, although our findings suggest that promotional efforts should be targeted at children as well as adults. However, additional large-scale research is needed, to both elicit more detailed information regarding the views and experiences of children and their parents in relation to cycling and other health and safety practices, and also to explore how parental perceived awareness and acceptance of legally enforced versus voluntary practices, affects their children overall awareness of, and adherence to, appropriate cycle safety.

Correspondence: MB Quirke
Department of Psychology, University of Notre Dame, Maynooth, Co Kildare
Email: mary.quirke.2009@nuim.ie

Acknowledgements
The children, parents and principals who very kindly consented to be involved in the study. This study was part of a larger evaluation research project commissioned by the Childhood Development Initiative (CDI) for Tallaght West and funded by the Atlantic Philanthropies and the Office of the Minister for Children and Youth Affairs (OMCYA).

References
4. Curnow WJ. The Cochrane collaboration and bicycle helmets. Accident Analysis and Prevention, 37, 569-573; 2005
15. Comiskey CM, O'Sullivan K, Quirke MB, Wynne C & McGilloway S. The Healthy Schools Evaluation Final Report. A part of a larger evaluation research project commissioned by the Childhood Development Initiative (CDI) for Tallaght West and funded by the Atlantic Philanthropies and the Office of the Minister for Children and Youth Affairs (OMCYA).
23. Some, Secondly.

22. Rissel C, Ming Wen L. The possible effect on frequency of cycling if mandatory bicycle helmet legislation was repeated in Sydney, Australia; a cross sectional survey. Health Promotion Journal of Australia, 22, 178-183; 2011.

