

## INQUIRY INTO VULNERABLE ROAD USERS

**Organisation:** Private Citizen  
**Name:** Professor Chris Rissel  
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## **Submission to Staysafe (Joint Standing Committee on Road Safety) – Vulnerable Road Users**

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Associate Professor Chris Rissel

School of Public Health, University of Sydney

[Chris.rissel@sydney.edu.au](mailto:Chris.rissel@sydney.edu.au) PH: 0418 417 291

This submission addresses bicycle safety and all references below to cycling refer to the use of a bicycle. Encouraging cycling should be a public policy priority because of clear benefits to health, reduced noise and air pollution, and reduced traffic congestion. Given increasing levels of obesity and diabetes, the impending crisis of peak oil and increasing cost of petrol, and the urgent need to reduce carbon dioxide emissions, increased use of the bicycle represents an incredibly efficient solution to a number of social problems.

This submission address several of the terms of reference of the Inquiry. These are:

- c) underlying factors in motorcycle and bicycle injuries and fatalities;
- d) current measures and future strategies to address motorcycle and bicycle safety, including education, training and assessment programs;
- f) motorcycle and bicycle safety issues and strategies in other jurisdictions; and
- g) any other related matters.

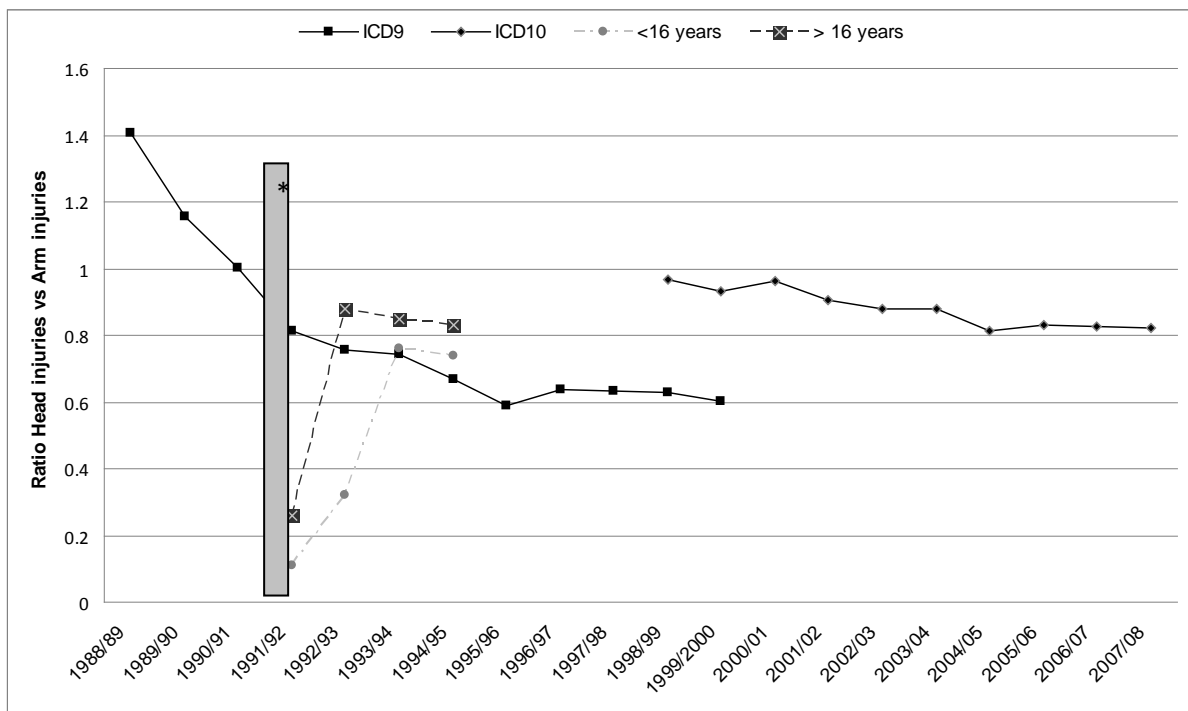
### **g) Related matters – Bicycle helmet legislation: well intentioned, but ineffective**

Head injuries are the most common cause of bicyclist fatalities and serious disability,[1] which, in Australia has led to mandatory helmet legislation. Legislation for the mandatory use of bicycle helmets is a controversial issue internationally,[2-4] with different research methodologies such as case-control studies and population based studies, reaching different conclusions.[5] Australia and New Zealand are the only two countries in the world with mandatory adult helmet use laws, introduced in Australia for adults on January 1 1991, and for children under 16 years from July 1991.

Advocates for helmet use cite evidence from bio-mechanical tests and case-control studies that repeatedly show that helmets protect against impact to the head,[6,7] if worn correctly.[8] Anti-helmet advocates claim that mandatory helmet legislation has reduced the

number of people cycling and this has led to reductions in cycling-related injuries attributed to the legislation. The reduction in numbers of people cycling may have actually increased the risk to the remaining cyclists because of Smeed's Law and the safety in numbers hypothesis.[9] Further, the debate over what protection helmets and helmet legislation may provide is a distraction from the main bicycle related health issue: the overall safety of the bicycling environment [10] and that cost-benefit analyses do not support mandatory helmet use [10,11].

A new analysis of the ratio of head to arm injuries of pedal cyclists from 1988 to 2008 (published in the August 2010 issue of the *Journal of the Australasian College of Road Safety (Voukelatos and Rissel 2010)*) demonstrates that there was a significant decrease in head injuries BEFORE the introduction of mandatory helmet legislation in 1991, and very little decline afterwards (see Figure 1).



**Figure 1: Ratio of head to arm injuries from 1988/9 to 2007/8 for all ages, plus self-reported helmet use for those younger than 16 years, and over.**

\* Mandatory helmet wearing legislation introduced for adults January 1, 1991

It is apparent from the results that the ratio of head to arm injuries was already declining in NSW before the introduction of mandatory helmet legislation, and certainly before the self-

reported level of helmet use increased. This is consistent with other data indicating a general decline in motor vehicle related fatalities and morbidity in NSW from 1950 to the present, but in particular between 1980 and 1990.[12] A similar pattern of decline is evident for pedal cycle fatalities in Australia, with a steep drop in cycling deaths from 1989 (98) to 1992 (41), corresponding with a similar drop in head injuries.[13]

It is most likely that a series of changes in road safety and conditions before 1991 contributed to a generally safer road environment, which benefited people cycling as well as other road users. For example, on December 17, 1982, New South Wales, introduced random breath testing, with an immediate decline in road deaths, which soon stabilized at a rate approximately 22 percent lower than the average for the previous 6 years.[14] The introduction of intensive road safety advertising in 1989, and the introduction of speed camera programs in 1990, plus the implementation of national road safety strategies all contributed to marked reductions in traffic related mortality and morbidity through the 1980s and early 1990s.[15]

The analysis by Voukelatos and Rissel summarized here explored the relationship between mandatory helmet legislation and head injuries among cyclists by removing problems due to a lack of the number of people cycling as a denominator. Using hand/arm injuries by cyclists as a control means that cyclists are compared with cyclists, and that any change in the ratio of the head to arm injuries should be the result of a change in practice, such as helmet wearing. Two other previous papers looking at the impact of helmet legislation reported on pedestrian deaths and head injuries as a comparison with cyclists before and after 1991. Robinson found a decline in deaths and serious head injuries among pedestrians paralleled the decline in these injuries among cyclists between 1988 and 1992.[9] Between 1988 and 1994 the decline in deaths from head injuries among pedestrians was 8% greater than the decline in deaths from head injuries among cyclists.[11] Clearly pedestrians are not affected by helmet legislation, yet the reduction in head injuries among pedestrians supports the idea that factors other than helmets may be responsible for generally safer road conditions.

New Zealand introduced mandatory helmet legislation on January 1, 1994. There was a dramatic increase in helmet use and a 51% drop in the number of trips by bicycle between 1989/90 and 2003-6 [17]. An analysis of changes in head injury rates noted a gradual decline over time, but no marked improvement associated with increased helmet use compliance [18]. Robinson noted that, similar to the NSW data, the ratio of head injuries to

limb injuries among cyclists had begun falling well before New Zealand's helmet law went into effect [19]. Between 1993 and 1994, the law dramatically increased helmet use from 43 percent to 93 percent of cyclists, but head injuries continued declining at the same rate as before [19]. An examination of road user fatalities in New Zealand found that cyclist fatalities did not fall at any greater rate than for other road users after law enforcement in 1994, even with fewer people cycling [20].

Four provinces in Canada have helmet legislation for children aged less than 18 years, with one analysis of head injury rates before and after the legislation demonstrating reductions in head injury rates [21]. However, in two of the provinces (Ontario, British Columbia) representing 89% of the total data set, again most of the falls in head injuries took place before the laws came into effect [22]. In British Columbia head injury increased in the year following the law and then declined at a rate not significantly different to no-law provinces. In Ontario post-law the decline in head injuries was also similar to non-law provinces [22]. This suggests that changes in the road environment or other factors, rather than helmet legislation, may have been responsible for the changes.

Sweden is the only other country to introduce mandatory helmet legislation, in their case for children under 15 years of age in 1991. Data from the Swedish National Road and Transport Research Institute show clearly that helmet use increased since 1991, and over the same period the number of children cycling declined [23]. Israel and Mexico City have introduced helmet legislation, but subsequently repealed it [24], in part because of the difficulties it created for introducing free bicycle loan schemes.

Darwin and the Northern Territory of Australia has a deliberate policy of non-enforcement of the helmet legislation. Bicycle injury rates are not different to those of the rest of Australia, and indeed are somewhat lower than in other states. Darwin has the highest proportion in Australia of women cycling to work (31%), with female cycling rates broadly indicative of how safe a cycling environment is (in some European cities it is about 50-55%, and in Sydney it is 20%). With no obvious adverse effects in Darwin from not enforcing helmet legislation, this suggests that a trial in other places where helmet legislation is either not enforced or repealed would not lead to increased injuries.

It is important to remove mandatory helmet legislation for several reasons:

- It reduces the number of people cycling, which actually makes it less safe for those people cycling because of the safety in numbers effect

- It inhibits spontaneous riding (eg just hopping on a bike for a short ride) if a suitable helmet is not available (and will negatively impact upon public bike hire schemes)
- It adds to the image of cycling as a “dangerous” activity, that requires protection, rather than an image of cycling which is safe, fun and healthy
- Requiring the person riding a bicycle to wear protection, without addressing the road environment and behaviours and attitudes of drivers, is a victim-blaming approach that unfairly puts the onus of responsibility on the bicycle rider.
- A focus on helmet legislation as a solution for the safety of people riding bicycles is a very inadequate response to bicycle safety, when it is obvious that cycling infrastructure, vehicle speed and driver behaviours are far more important cycling safety factors
- There is minimal evidence of helmet legislation actually reducing cyclist head injuries

It is likely that other factors explain the lack of temporal effect of introducing helmet legislation and reduction in head injuries. One way to generate evidence of the effectiveness of helmet legislation, either in support or against, would be to conduct a natural experiment in one state or jurisdiction. If the helmet legislation was repealed for a trial period, and carefully monitored to assess the effects on head injuries, this could provide high quality data to make an informed decision about the relative value of mandatory helmet legislation.

### **Recommendation 1**

That mandatory bicycle helmet legislation be repealed for a trial period in at least one jurisdiction (for example, Newcastle, or City of Sydney) and the effects carefully evaluated to monitor effects on head injury rates at a population level.

### **c) Underlying factors in bicycle injuries and fatalities**

The majority of cyclist fatalities and serious injuries involve motor vehicles, with motor vehicle drivers causing the problem in the majority of cases. Lack of appropriate cycling infrastructure has been well documented as a reason why people do not cycle, or do not cycle to work [25]. Perceptions that it is not safe to cycle are a significant psychological barrier to cycling, even when the actual risk may not be high. Providing separated bike paths in some places will be necessary before many people will consider it is safe and comfortable to cycle for transport.

Once on a bicycle, it would be expected that a more realistic assessment of risk is made, and this has been documented in earlier research: there is a significant association between greater experience riding on the road and lower risk ratings [26]. Therefore, programs and strategies that encourage non-riders to trial cycling and have a positive experience will increase prevalence of cycling. This has been observed in a follow-up study of beginner cyclists and physically inactive participants of the Sydney Spring Cycle [27], where participation in the popular mass event led to sustained cycling and increased physical activity. Similarly, participation in schemes such as Ride to Work have demonstrated that non-regular riders participate, and a quarter of new riders continue to ride to work when assessed five months later [28].

Speed of motor vehicles and the speed differential between motor vehicles and bicycles is one of the main factors that generates fear of cycling on roads. Therefore strategies that reduce the speed of motor vehicles near bicycles are critical. Many European towns and cities have a 30km /hour speed limit for quiet residential streets, which significantly reduces the severity of injury should a motor vehicle collide with a person on a bicycle or walking, and helps to create an environment which is more bicycle friendly. Other treatments for residential areas to reduce 'rat running' and through traffic such as road closures with gaps for bicycle access, can create a network of safe on-road bicycle routes at minimal cost. This clearly involves a traffic management policy that favours bicycles over motor vehicles.

### **Recommendation 2**

Introduce 30km/hour speed limits for residential streets

### **Recommendation 3**

Support road closures for through motor traffic and facilitate bicycle flow

### **Recommendation 4**

That an active policy of building high quality separated and on-road cycle paths be funded and implemented, with a particular emphasis on retro-fitting such infrastructure on existing regional routes.

### **Recommendation 5**

That public funding be allocated to support community cycling events or programs, particularly for those programs targeting non-riders or occasional bicycle riders.



#### **d) Current measures and future strategies to address bicycle safety, including education, training and assessment programs**

In addition to the CARES facilities in NSW, there is a bicycle education component of the PDHPE curriculum in NSW schools. However, a relatively small proportion of schools take up the opportunity of the CARES facility, and the effectiveness of the school based bicycle education for cycling promotion or safety is questionable. High cycling prevalence countries in Europe (eg Holland, Germany and Denmark) have a systematic and practical program of cycling education for all primary school students. Under these models, all students are capable of cycling safely. It is well known that it is much more difficult to learn to cycle as an adult, and therefore it is critical that children have the opportunity to learn to ride a bicycle.

Poor driver attitudes to people on bicycles and poor road rule knowledge as relating to cycling contributes to hostile driver behaviours. There are many anecdotal reports of people riding in the middle of a lane who are aggressively given the horn by motorists, who perhaps are unaware that it is legal for a bicycle to occupy a whole lane, or to ride two abreast in a lane. A survey of Sydney driver attitudes and knowledge of road rules found that only 19% of drivers knew that it is legal for cyclists (and motorcyclists) to ride two abreast, and that 37% of drivers did not know it was legal for bicycles to occupy a whole lane, [26]. A much greater emphasis on driver knowledge of road rules relating to vulnerable road users needs to be implemented. It would not be difficult or expensive to introduce a brief knowledge quiz or test when drivers renew their licenses. This could be mailed to drivers, who are asked to bring the completed form with them when they renew.

Given the value of cycling to society (eg not fossil fuel dependent, increased health, less congestion, less pollution and greenhouse gas emissions) it is important that the general public values cycling and supports initiatives that make cycling easier and safer. Social marketing campaigns that focus on the virtues of cycling, rewarding those that do cycle, and encouraging non-riders to start riding are needed. Promotion of cycling is needed to increase the numbers of people cycling, and this will achieve significant safety benefits from the 'safety in numbers' effect [29].

Cycling skills courses.

Many non-riders report a lack of skills and confidence to ride on roads or in traffic. Cycling skills courses have increasingly become available, and have been very popular. An early

evaluation of a series of such courses found that at two months follow-up the courses had significantly increased participants self reported skills and confidence for cycling. More than half of the participants (56%) said they cycled more two months after the course. There was a 40 per cent increase in participants having cycled in the previous week at follow-up among baseline non-cyclists, and there was a significant increase in weekly participation in other forms of moderate intensity physical activity [30]. Evaluations of more recent programs show similar results.

### **Recommendation 6**

That a mandatory system of driver road rule knowledge testing (as related to vulnerable road users) be done during the license renewal process

### **Recommendation 7**

That a government supported program of bicycle education incorporating practical skills be systematically implemented across all NSW primary schools (as is done in some European countries)

### **Recommendation 8**

That a government supported program of bicycle skills and competencies (eg Austcycle) be available for adults.

### **Recommendation 9**

Government funded public education programs highlighting the benefits of cycling and encouraging more people to cycle should be implemented.

## **f) Bicycle safety issues and strategies in other jurisdictions**

People riding bicycles routinely report aggression and hostile behaviour from motor vehicle drivers [31] (O'Connor and Brown, 2010), sometimes deliberate and more often simply from poor driving. Without a police witness, there is often no recourse for a cyclist if harassed.

The New Zealand Community Road Watch

Program(<http://www.police.govt.nz/service/road/roadwatch.html>) is one approach that may provide a forum for the community to assist in addressing poor or risky road behaviour. It simply provides a mechanism for the public to be able to report bad behaviour, and this generates a letter which is sent to the owner of the registered vehicle. If four or more reports are received then police may visit. Complainants must identify themselves, which removes the temptation for vexatious complaints.

## **Recommendation 10**

That a Community Road Watch Program be introduced.

### **List of recommendations:**

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### **References**

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