

Cycle Helmets

THIS BRIEFING COVERS: Impact of helmet promotion/laws; low risks of cycling; deterrent effects of helmet laws and net loss to public health; exaggerated safety claims; enforcement problems; alternative ways to make cycling conditions safer; need for informed decisions; organisational helmet rules; off-road, recreational and sports cycling.

HEADLINE MESSAGES

- Cycling UK is opposed to both cycle helmet laws and to helmet promotion campaigns because these are almost certainly detrimental to public health. Evidence shows that the health benefits of cycling are so much greater than the relatively low risks involved, that even if these measures caused only a very small reduction in cycle use, this would still almost certainly mean far more lives being lost through physical inactivity than helmets could possibly save, however effective.
- In any case, there are serious doubts about the effectiveness of helmets. They are, and can only be, designed to withstand minor knocks and falls, not serious traffic collisions. Some evidence suggests they may in fact increase the risk of cyclists having falls or collisions in the first place, or suffering neck injuries.
- Neither enforced helmet laws nor promotion campaigns have been shown to reduce serious head injuries, except by reducing cycling. The remaining cyclists do not gain any detectable reduction in risk, and they may lose some of the benefits from 'safety in numbers'.
- So instead of focusing on helmets, health and road safety professionals and others should promote cycling as a safe, normal, aspirational and enjoyable activity, using helmet-free role-models and imagery. Individual cyclists may sometimes choose to use helmets, either for confidence or because of the type of cycling they are doing. However, they should not feel under any pressure to wear them. For the sake of our health, it is more important to encourage people of all ages to cycle, than to make an issue of whether they use a helmet when doing so.

KEY FACTS

- In the UK, the life years gained due to cycling's health benefits outweigh the life-years lost through injuries by around 20:1. Mile for mile, the slim chances of being killed whilst cycling are about the same as those for walking, and on average, one cyclist is killed on Britain's roads for every 29 million miles travelled by cycle.
- Enforced helmet laws have consistently caused substantial reductions in cycle use (e.g. 30-40% in Perth, Western Australia). They have also increased the proportion of the remaining cyclists who wear helmets, yet the safety of these cyclists has not improved relative to other road user groups (e.g. in New Zealand).
- Even if helmets could prevent all cyclist injuries (including non-head injuries), a UK helmet law would only have to reduce the level of cycle use by about 4.7% to shorten more lives through inactivity than helmets themselves could possible save.
- Standards only require cycle helmets to withstand the sort of impact that a rider is likely to suffer if they fall from their cycle from a stationary position (about 12 mph). They are not and cannot be designed to withstand impacts with faster-moving cars, let alone lorries.
- Cycling typically accounts for 7-8% of the head injuries for which children are admitted to English hospitals – just a quarter of these to parts of the head that a helmet might protect.



Cycling UK VIEW

- Government and other bodies concerned with health or road safety should simply aim to encourage people to cycle, regardless of whether or not they choose to wear helmets when doing so.
- Enforced helmet laws cause deep and enduring reductions in cycle use, undermining its very substantial health and other benefits. Given that the risks of cycling are low – they are not greatly different from those of walking or other forms of active recreation – even a very small reduction in cycle use would be counter-productive to health and other public policy objectives, regardless of the effectiveness or otherwise of helmets. In practice, this disbenefit is potentially very substantial, not least because the deterrent effect is likely to be strongest among key target groups for physical activity promotion, e.g. women, teenagers, less well-off communities and ethnic minority groups.
- Cycle helmets have in any case not been shown to be an effective way to reduce cyclists' injury risks. Indeed they might even be counter-productive, by encouraging drivers or cyclists to behave less cautiously, and/or by increasing the risks of neck and other injuries. By deterring people from cycling, they may also reduce the benefits that cyclists gain from 'safety in numbers'.
- Enforcing helmet laws would require levels of police activity that would be grossly disproportionate to any possible benefits. Conversely, unenforced helmet laws make no long-term difference to helmet use, and therefore cannot provide benefits in any case.
- Road safety policies should prioritise measures that reduce the risks that deter people from cycling – traffic speeds, hostile roads and junctions, dangerous or irresponsible driving, and lorries – and offering high quality cycle training for people of all ages, to give them the confidence and skills to ride safely on the roads.
- Individuals should be free to make their own decisions about whether or not to wear helmets, with parents making these decisions in the case of younger children. Their decisions should be informed by clear information about the uncertainties over the benefits or otherwise of helmets.
- Cycling UK supports politicians, celebrities and other role-models who choose to cycle un-helmeted. Far from "acting irresponsibly", they help to boost the perception of cycling as a normal, safe, aspirational and stylish activity that anyone can do in whatever clothes they normally wear.
- Schools, employers and the organisers of non-sporting cycling events (e.g. sponsored rides) should not impose helmet rules for their pupils, staff and participants respectively. These rules are not justified in terms of health and safety, they are likely to reduce both the numbers and the diversity of people who take part in cycling, and they may in some circumstances be illegal.
- There is limited evidence on the risks involved in different types of off-road recreational cycling (from family riding to downhill mountain biking etc) and cycle sport. Likewise, evidence on the potential for helmet use to mitigate (or exacerbate) these risks is equally limited. These are in any case not matters for road safety policy.
- For sporting events, Cycling UK recognises the right of governing bodies to require the wearing of helmets in line with their own and international regulations for these events, given the different types of risk to which sport cyclists are exposed.

For more detail on the evidence for not making cycle helmets compulsory in law or the subject of promotional campaigns, see:

www.cyclinguk.org/sites/default/files/file_public/helmets-evidencebrf.pdf



BACKGROUND INFORMATION

1. Impact of helmet promotion/laws

Cycling UK view

- Government and other bodies concerned with health or road safety should simply aim to encourage people to cycle, regardless of whether or not they choose to wear helmets when doing so. Enforced helmet laws cause deep and enduring reductions in cycle use, undermining its very substantial health and other benefits. Given that the risks of cycling are low – they are not greatly different from those of walking or other forms of active recreation – even a very small reduction in cycle use would be counter-productive to health and other public policy objectives, regardless of the effectiveness or otherwise of helmets. In practice, this disbenefit is potentially very substantial, not least because the deterrent effect is likely to be strongest among key target groups for physical activity promotion, e.g. women, teenagers, less well-off communities and ethnic minority groups.
- Cycle helmets have in any case not been shown to be an effective way to reduce cyclists' injury risks. Indeed they might even be counter-productive, by encouraging drivers or cyclists to behave less cautiously, and/or by increasing the risks of neck and other injuries. By deterring people from cycling, they may also reduce the benefits that cyclists gain from 'safety in numbers'.

a. The health and other benefits of cycling

To maximise all the benefits of cycling, laws and measures that have an impact on the activity should be sure to encourage and not undermine it. Its health benefits are especially substantial: it helps keep people physically active, and combats obesity and other serious diseases.

For more facts on cycling and health, see

www.cyclinguk.org/campaigning/views-and-briefings/health-and-cycling

b. The low risks of cycling

There is no justification for picking out cycling as a particularly high risk activity that warrants mandatory head protection, or promotional campaigns warning of its dangers:

- **Cyclists aren't especially prone to head injuries.** Cycling has long been, and still is¹, one of the most popular sports activities for children. Yet analysis carried out in 2005 suggests that it typically accounts for just 7-8% of the head injuries for which children were admitted to English hospitals. Of these injuries, just a quarter are to parts of the head which might be protected by a helmet, and it is likely that some of these injuries were suffered by helmeted children anyway.²
- On average, over 2011-15, one cyclist was killed on Britain's roads for every 29 million miles travelled by cycle.³ This equates to around one cyclist for every 1,000 (plus) times cycled round the world.
- The general risk of injury of any severity whilst cycling is just 0.05 per 1,000 hours of cycling.⁴
- Generally speaking, you are about as unlikely to be killed in a mile of cycling as in a mile of walking (although in both 2014 and 2015, pedestrians fared rather worse).⁵

For more, see Cycling UK's briefing on *Cycling and Road Safety* at

www.cyclinguk.org/campaigning/views-and-briefings/road-safety-and-cycling-overview

c. Helmet laws: the deterrent effect

Helmet laws, where enforced, have consistently led to substantial reductions in cycle use, especially amongst the groups of people who are often the target audience of campaigns to promote physical activity (e.g. women, teenagers and children):⁶

- Western Australia’s helmet law reduced cycling in Perth by 30-40%⁷, and helmet laws elsewhere have had similar results.⁸
- Reductions among child and teenage cyclists have been even larger: down by 36% and 44% respectively in Melbourne,⁹ and c.90% among female secondary school pupils in Sydney.¹⁰
- Some countries or states have seen recoveries, mainly of adult recreational cycling. However, in all these cases, there was little or no enforcement, or enforcement was relaxed.¹¹ Conversely, where police keep enforcing a helmet law, cycle use stays low, particularly among children and/or for day-to-day journeys (e.g. for school/commuting). Cycling trips in New Zealand initially fell by 26% following its helmet law in 1994, but continued falling to 51% below their pre-law levels by 2006.¹²

d. Helmet laws: net loss to public health

- One study has used mathematical modelling to show that helmet laws are almost bound to have a net disbenefit to public health.

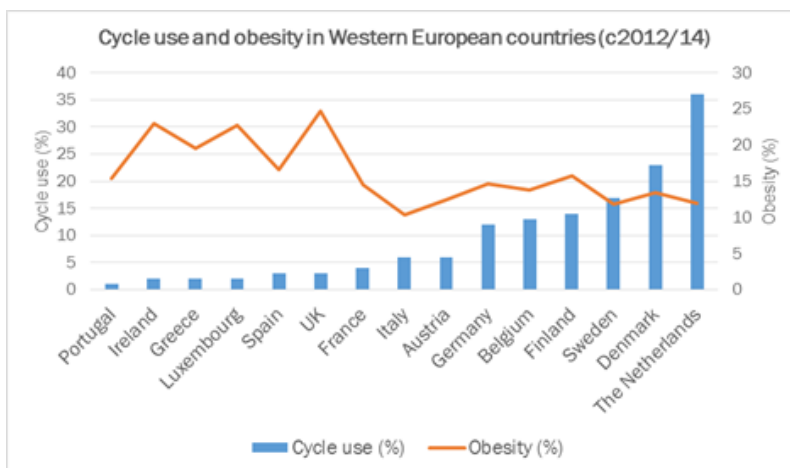
A positive health benefit could only arise under really extreme assumptions, i.e. that helmets must be highly effective; that a law must cause only a very small percentage reduction in cycle use; and that it is introduced into a country or state where cycling is a particularly high-risk activity (i.e. relative to the health benefits that would be lost as a result of the law).¹³ In fact, as discussed in this briefing, none of these assumptions is realistic. Using a set of more widely recognised (but still questionable) assumptions, the study’s author has also estimated that a UK helmet law would have a net annual health disbenefit of \$400m (or c£260m).¹⁴

- The Government has endorsed estimates suggesting that the life years gained from cycling’s health benefits outweigh the life-years lost through injuries on UK roads by around 20:1.¹⁵ Using this figure, there would be a net public health disbenefit from telling people to wear helmets if it results in more than one person being put off cycling for every 20 who continue, even if helmets were 100% effective at preventing ALL cycling injuries (i.e. not just head-only injuries) for these remaining cyclists.

This gives a theoretical threshold of 4.7% as the maximum permissible reduction in cycle use to avoid a net public health disbenefit, under these (impossible) assumptions. Allowing for a reasonable estimate of the proportion of cycling’s injury disbenefits which are due to non-head injuries, this maximum threshold falls to c2%, even for the most optimistic estimates of the protective effect of helmets against head injuries. In practice, the threshold is likely to be much closer to, or possibly below, 0%, under more realistic assumptions of helmet effectiveness. (See our ‘Evidence’ briefing, Appendix A for more on this calculation – link on p10).

- **Obesity:** Although not demonstrably a causal relationship, international comparisons suggest an apparent link between cycle use and obesity rates (see chart, right).

Source: Cycle use (% of people who said they used a bicycle more often than any other mode on a typical day): EC *Special Barometer 422a - Quality of Transport / Obesity*: OECD *Obesity Update June 2014*.



e. Doubts over the safety case for helmet use

- **Unreliable evidence.** It is not clear whether or not helmets are effective in reducing the (limited) risks of cycling. While some older studies report substantial safety benefits from helmet-wearing, most use a ‘case-control’ methodology, which is prone to spurious findings. Studies into hormone replacement therapy, vitamin supplements and the MMR vaccine, which used this same or similar methodology, yielded what are now known to be false outcomes.¹⁶

One particular US case-control study into the effectiveness of helmets has been widely quoted since it was published (*Thompson and Rivara, 1989*),¹⁷ but its claim that cycle helmets are up to 85% effective in mitigating head injuries has long been disputed.¹⁸ Indeed, in 2013, the US Department of Transportation agreed to stop quoting this figure in materials disseminated through its website following submissions, under the *Data Quality Act*, from the Washington Area Bicycle Association who proved that it was incorrect.¹⁹

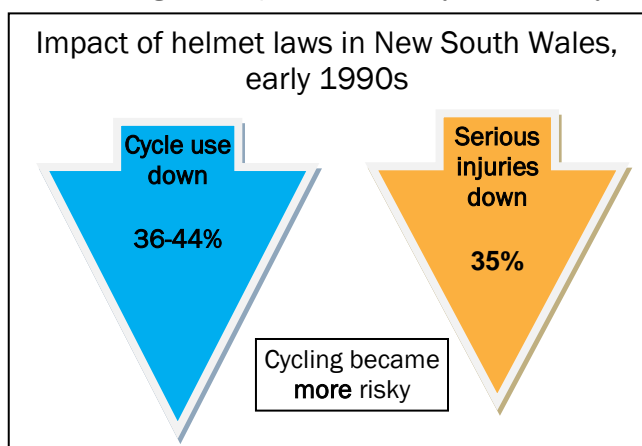
- **No link between increased helmet wearing and improved cyclist safety.** Meanwhile the ‘real world’ histories from places with helmet laws (e.g. New Zealand, Australia and in some Canadian provinces) show no link between increases in helmet-wearing and improvement in cyclists’ safety.

If anything, the available data suggest that reductions in cycle use have typically been greater than the reduction in cyclist casualties.

For instance in New South Wales, a 36-44% reduction in children cycling was measured, but only a 35% decline in serious injuries (see chart right).²⁰

This suggests that the risks faced by the remaining cyclists had actually worsened, even though most were now wearing helmets.

This is not surprising, as there is good evidence that cyclists gain from ‘safety in numbers’, with cycle safety being poorest in places with low cycle use.²¹



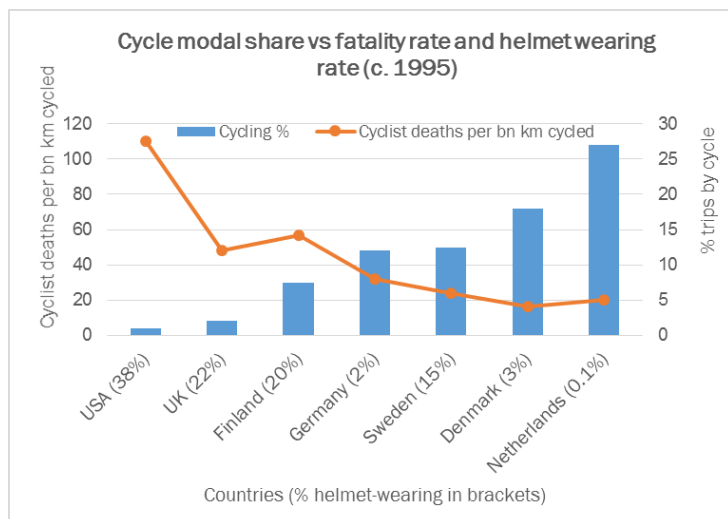
Helmet laws in New Zealand and Australia substantially increased helmet use, but with no detectable effect on cyclist head injuries relative to those suffered by other road users groups/the population overall. Reduced cycle use (26% in New Zealand and c30% in Australia) merely undermined cycling’s environmental and other benefits, while the risks increased for those cyclists who remained.²²

In Canada, research into hospital admission rates (2006-2011) for cycle-related injuries in jurisdictions with different helmet laws did not find a relationship between injury rates and helmet legislation. The results were published in the *British Medical Journal* (BMJ, 2015).²³

This confirms research published earlier in the BMJ concluding that helmet compulsion in certain provinces had minimal impact on reducing the rate of admissions to hospital for cycling-related head injuries. Injury rates, the authors say, were already going down in the provinces with compulsion.²⁴

Repeals of mandatory helmet laws

- 2017, **Bosnia and Herzegovina** - repeal of all-age law, chiefly to encourage cycling;
- 2010, **Mexico City** - in view of new public bike hire scheme, Ecobici;
- 2007, **Israel** - partial repeal; now applies only to people under 18 (not enforced)



Low cycle use (e.g. USA, UK) is linked with poor cycle safety, despite high helmet use.
Source: www.cyclehelmets.org/1079.html#235

- **Cycle helmets are (and can only be) designed for minor falls, not collisions with moving traffic.**²⁵
 - As mentioned, the standards that apply to cycle helmets (Euro standard EN1078) require them to withstand the sort of impact that a rider is likely to suffer if they fall from their cycle from a stationary position (about 12 mph).
 - In fact, the tests that cycle helmets currently go through mean that they should offer similar protection to a pedestrian who trips and falls to the ground. The impact of a collision with a moving car, especially if it is speeding, is much greater than this.
 - A cycle helmet manufactured to provide this level of protection would be virtually un-wearable because of its bulk and inadequate ventilation (an important consideration given the physical activity involved in cycling).

For a full discussion of standards, and the science behind cycle helmets as protective equipment, see *Heads Up*, by Brian Walker of the helmet-testing lab Head Protection Evaluations, www.cyclehelmets.org/papers/c2023.pdf (article in *Cycle*, June/July 2005).

- **Helmets may increase the risk of falls or collisions happening in the first place.** One study found that cyclists with helmets had a 14% higher injury risk per mile travelled than non-wearers.²⁶ There are many possible explanations for this. To give just a few examples:
 - It is known that some cyclists ride less cautiously when wearing a helmet.^{27,28} This is an example of 'risk-compensation'²⁹, also observed in young children with helmets.³⁰
 - Drivers may also 'risk-compensate', as they have been found to leave less space when overtaking helmeted than unhelmeted cyclists.³¹
 - The increased size, weight or even the temperature of the head may also be factors. For instance, there are suggestions that glancing blows to an effectively enlarged head could lead to the most serious brain or spinal injuries in situations where an unhelmeted head would have suffered a mere glancing blow or not been hit at all.³²
 - Children have been strangled by their helmet straps.³³
 - Finally, the erosion of 'safety in numbers' benefits mentioned above could also be a significant factor.
 - A study looking at cyclists' safety following the expansion of cycle infrastructure in Boston (rather than at helmet use specifically), found that individuals with 'documented' helmet use had 1.85 times the odds of being involved in an injury incident.³⁴

2. Enforcement

Cycling UK view: Enforcing helmet laws would require levels of police activity that would be grossly disproportionate to any possible benefits. Conversely, unenforced helmet laws make no long-term difference to helmet use, and therefore cannot provide benefits in any case.

To increase helmet-wearing rates, countries have needed to invest heavily in promoting and then enforcing their helmet laws. In Queensland, cyclists were three times more likely per mile travelled to receive a penalty for not wearing a helmet than all other road users for all other traffic offences put together.³⁵

Arguably, attempting to enforce a helmet law against child cyclists or their parents is not a good use of already overstretched police resources. Alternatively, not enforcing helmet laws may avoid undermining cycle use, as in the widely quoted example of Ontario.³⁶ Such laws, though, have no detectable impact on helmet-use either, and therefore serve no practical purpose.³⁷

3. Alternative strategies and measures

Cycling UK view: Road safety policies should prioritise measures that reduce the risks which deter people from cycling – traffic speeds, hostile roads and junctions, dangerous or irresponsible driving, and lorries – and offering high quality cycle training for people of all ages, to give them the confidence and skills to ride safely on the roads.

As discussed above, it is a mistake to assume that promoting cycle helmet wearing and/or making it mandatory is the way to improve road safety for cyclists. Rather than placing faith in what is at best limited protection to only one part of the body, the focus should be on measures that prevent cyclist collisions occurring in the first place. For an outline of these, see Cycling UK's briefing: *Road Safety & Cycling*: www.cyclinguk.org/campaigning/views-and-briefings/road-safety-and-cycling-overview

4. Individual decisions

Cycling UK view:

- Individuals should be free to make their own decisions about whether or not to wear helmets, with parents making these decisions in the case of younger children. Their decisions should be informed by clear information about the uncertainties over the benefits or otherwise of helmets.
- Cycling UK supports politicians, celebrities and other role-models who choose to cycle unhelmeted. Far from “acting irresponsibly”, they help to boost the perception of cycling as a normal, safe, aspirational and stylish activity that anyone can do in whatever clothes they normally wear.

Cycling UK believes that everyone who cycles, or wishes to take up cycling, should be left to make their own, well-informed decision about whether to wear a helmet or expect a child to wear one. These individual decisions should certainly not be based on the exaggerated claims discussed above, but on clear, unbiased information, *and the same is true of public policy*. Some people prefer to cycle with a helmet (indeed some say they feel nervous without one), and Cycling UK supports their choice.

Whenever politicians, celebrities or other role-models appear in public or are photographed unhelmeted whilst cycling, it almost inevitably stirs up disapproval. The media may even consider it to be more newsworthy than any other aspect of the story in question. Cycling UK, however, always welcomes it when celebrities or others promote cycling positively as a normal activity, whatever they choose to wear.

5. Organisational helmet rules

Cycling UK view: Schools, employers and the organisers of non-sporting cycling events (e.g. sponsored rides) should not impose helmet rules for their pupils, staff and participants respectively. These rules are not justified in terms of health and safety, they are likely to reduce both the numbers and the diversity of people who take part in cycling, and they may in some circumstances be illegal.

Schools, employers and organisers of non-sporting cycling events often specify that all riders must wear a cycle helmet in order, for instance, to cycle to and from the premises, undergo cycle training, cycle on business using their own or pool bikes, or to participate in an organised ride.

Organisations tend to adopt these rules because they are worried about their liability if the cycling activity they are promoting results in someone being injured. Some also believe that making sure that people are wearing head protection helps fulfil their duty of care. Likewise, event insurers often insist that the organisers make helmets an entry requirement.

However, it is important not to put any barriers in the way of anyone who may wish to take up cycling or simply wants to try it out for the first time by casually participating in an event. Organisational helmet rules are unjustified because:

- The effectiveness of helmets is often exaggerated (see above);
- People are much more likely to benefit from cycling than not cycling (see above);
- It is unlikely that an injury will occur - cycling is not an unduly risk activity (see above);
- Barring individuals from an activity simply because they do not own, wish to borrow or purchase a relatively costly item of personal safety equipment discriminates against them;
- Unlike motorised vehicles, cycles cause little harm to other road users, so making cycling as accessible as possible is, arguably, the responsible thing to do. On the other hand, facilitating car travel contributes to the source of danger for all road users.
- Workplace bans are likely to be unlawful (unless they are based on a valid risk assessment related to the specific work that cycling employees are expected to undertake). Cycling UK understands from the Health and Safety Executive that cycle helmets are not defined in law as 'Personal Protective Equipment' (PPE), and attempts to impose helmet rules as work uniform may breach European Human Rights law.



6. Off-road, recreational cycling and cycle sport

Cycling UK view:

- There is limited evidence on the risks involved in different types of off-road recreational cycling (from family riding to downhill mountain biking etc.) and cycle sport. Likewise, evidence on the potential for helmet use to mitigate (or exacerbate) these risks is equally limited. These are in any case not matters for road safety policy.
- For sporting events Cycling UK recognises the right of governing bodies to require the wearing of helmets in line with their own and international regulations for these events, given the different types of risk to which sport cyclists are exposed.

Helmet use is typically high amongst those voluntarily engaging in the more challenging and risky types of cycling (e.g. mountain biking), but there is limited evidence on how much effect helmet wearing has on the risks involved. Road safety policy, however, has no relevance here.

Cycle sport: British Cycling, the governing body for cycling racing in the UK, requires participants to wear a cycle helmet:

“A rider whilst racing or training in any cycling discipline, with the exception of training on the open road shall wear properly affixed protective headgear which must be of a hard/soft shell construction.”
(Technical Regulations General & for Road, Track & Roller Racing, Rule 8.6.1 British Cycling).

In 2003, the International Cycling Union (UCI), the world governing body for sports cycling, made helmet wearing mandatory for riders in all endorsed events. Originally, riders were permitted to remove their helmets for final climbs, but this allowance was subsequently revoked.

It has been argued that all cyclists should follow the lead of racers and wear cycle helmets too. However, this is similar to suggesting that ordinary, everyday motorists should wear helmets just because Formula 1 drivers do so. This would clearly be an unreasonable and disproportionate expectation.

In fact, before 2003 most professional riders chose not to wear a helmet whilst racing and, moreover, no studies have yet been published to indicate that injuries have gone down since the protection became compulsory. Indeed, racers are probably more willing to wear helmets now that modern designs give them aerodynamic advantage over remaining bare-headed.



FURTHER READING

- www.cyclehelmets.org and www.cycle-helmets.com both offer a comprehensive collection of papers, studies and articles about cycle helmets.
- Cycling UK's *Cycle Helmets: a review of the evidence*:
https://www.cyclinguk.org/sites/default/files/file_public/helmets-evidencebrf.pdf

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