Cycling: your health, the public's health and the planet's health

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Key issues relating to cycling and health

In 1898, the British Medical Journal reported that:

"In France the bicycle has done wonders, as those who remember Paris, Fontainbleau, and the intervening districts thirty years ago can bear witness if they once more revisit that pleasant part of the world."

A hundred years later, France's premier sporting event, the Tour de France, provided a wonderful reminder of the health benefits of cycling. Lance Armstrong was diagnosed in 1996 with metastatic testicular cancer, yet competed in – and won – the 1999 Tour barely a year after finishing four rounds of chemotherapy and two operations.

Modern medicine clearly played a significant role in Armstrong's recovery. Yet, while we don't know the effects of physical activity on the risk of testicular cancer, we do know that physical activity reduces the risk of colon and breast cancer, diabetes, coronary heart disease, and several other diseases, reduces falls in older people and – possibly most importantly – reduces feelings of anxiety and depression. Small wonder then that physical activity has been described as "today's best buy in public health".

Cycling promotes health in five different ways. It provides physical activity, reduces fatal road traffic crashes, increases social contact, reduces air pollution and is environmentally friendly and sustainable. This paper covers each of these areas and touches on one or two more contentious issues in the cycling and health debate: first, do the benefits of cycling outweigh the risks, and second, where are we at in the discussion on the benefits and disbenefits of cycle helmets.

The health benefits of cycling

Physical activity

The 1996 landmark Surgeon General's report on physical activity changed the way we think about the health benefits of physical activity. Previous thinking had focused on the benefits associated with vigorous activity, yet by 1996 it was clear that considerable benefit accrues with modest intensity activity. The recommendation changed from vigorous physical activity three or more times a week to 30 Minutes of moderate activity on most, if not every day. This shift in thinking brought a range of activities back into the picture again, including cycling. But now we were not just talking about strenuous road cycling or mountain biking: possibly no activity fits the 'moderate intensity' bill better than just plain cycling around.

Of the three main recommended aerobic activities – running, swimming and cycling – the latter has the largest potential: there is wide scope for take-up across all sections of the population, it can be maintained throughout life, and it is more readily integrated into the daily routine of travel to work, school and other local destinations. In New Zealand, 87% percent of children and 43% of adults own or have access to a bike.

The Surgeon General's report confirmed what cyclists all know: using a bike to get places is not just fun, it's good for you. In fact, we already knew this from some of the earliest evidence of the benefits of physical activity – the UK Doctors' Study (incidentally, the same study that in 1951 first produced good evidence that smoking causes lung cancer and kills people). The Doctors' Study found that doctors who cycled to work – and there were a lot more of them back in the 1960s when this result was published) – lived longer (and, one might speculate, better!!) than their non-cycling colleagues.

Other benefits to health

Cycling also contributes to the health of the community in a number of ways. People who cycle are reducing the community's overall risk of road traffic injury, although ironically they are probably increasing their own personal risk, at least on a risk per km travelled basis. Also ironically, cyclists reduce traffic congestion and the associated stress and frustration among people driving cars. Among other things, cycling is a highly selfless activity!!

Motorised traffic contributes to community severance and busy streets mean that children cannot play there and are discouraged from walking and cycling to school. As one recent BMJ correspondent elegantly stated: "The sad reality is that most streets are now linear car parks with a central race track". In contrast, by being relatively slow, noiseless and non-polluting, cycling contributes to the ambience of the urban environment and promotes social interaction. The absence of noise and pollution also avoids these known health risks to both cyclists and others in the community. Cycling is also equitable in that it is available to most people at almost any time – bike ownership in New Zealand crosses social and economic boundaries.

Above all, cycling is fun!!

The benefits and risks of cycling for health: what is the balance

Do the benefits of cycling outweigh the risks? We do know that physical activity reduces all-cause mortality, and that there is a 'gradient' effect, that is, all-cause mortality reduces further with increasing exercise. We also know that there are other important, if less quantifiable, benefits from cycling.

Yet we also know quite a lot about the risks associated with cycling. Foremost among them is the risk of injury. There also appears to be an increasing perception that cycling is 'risky'. Evidence from the UK suggests that deaths from road traffic injury for child cyclists per mile travelled declined between 1985 and 1992. Yet a substantial proportion of the overall reduction in cycling deaths among children was achieved at the expense of children's cycling activity.

Overall, the evidence appears to be fairly consistent that the benefits of cycling still outweigh the risks and costs. Furthermore, because we know from looking at countries such as Denmark and the Netherlands that the risks can be considerably reduced, the potential for an overall benefit to public health from cycling is considerable.

Cycling, the environment and sustainable transport

This issue hardly needs mentioning, as it is one of the central arguments behind advocacy for the greater use of cycling. Cycling is the most energy efficient mode of movement (not just transport) known to us. As a public health physician, I consider this potentially the most important 'health-related' benefit of cycling – that of preserving the ability of our planet to sustain a rich diversity of life in the future. Bicycles do not draw on the world's finite fossil fuels – a bicycle travels around 600 kilometres on the energy equivalent of a litre of petrol and the energy source, food, is of course renewable (and tastes a lot better than petrol!) It also follows that as bicycles are non-polluting, they make no contribution to the greenhouse gas problem that, spurred by strategically planted misinformation from multinational oil companies, the developed world seems so reluctant to face up to. Cycling is more than a small part of the answer.

Bicycles are also efficient space users in the urban environment, for example, 10 bicycles can be parked in the space required for one car. Thus, not only do they contribute to the sustainability of the earth's natural environment, they also enhance the urban environment by making it more pleasant and allowing more space for recreational facilities and open spaces.

The great helmet debate

As a building site labourer during University holidays in the heady (pre-Stockmarket crash) days of 1987, the foreman bellowed the following aphorism at me one day: "People with brains protect them!!". Of course, in those pre-OSH days, none of us actually did wear helmets – except for the (obviously brainy) foreman!! Then again, these were also the pre-ECA days when none of us worked in the rain either: instead, we polished our euchre skills and ate our way through endless pots of boiled lamb and watercress.

In the years after this weighty pronouncement, evidence began to accumulate that what is obviously common sense for labourers and others working on building sites also follows for cyclists. A series of epidemiological studies in the late 80s and early 90s showed that wearing cycle helmets reduced the risk of serious head injury or death. The evidence was compelling enough for me and shortly after I returned from overseas in early 1988 I bought, at considerable expense, my first bicycle helmet which I wore religiously thereafter. The evidence was also convincing enough for many other New Zealand cyclists and by 1992, more than a year before the introduction of compulsory helmet wearing, 84, 62 and 39% of primary school children, secondary school children and adults respectively were wearing helmets. After the introduction of legislation to compel the wearing of helmets while cycling on the road, rates increased further to around 90-95%. Only one or two other countries introduced similar legislation, notably Australia.

So what is the debate about helmets? The evidence on which decisions were made about introducing legislation was relatively sound. Sure, helmets can be hot and uncomfortable on warm days. Yet my own personal experience is that a helmet can be, quite literally, a lifesaver. The earliest murmurings that I heard against helmets were from a neurosurgeon who I worked for in 1994. He claimed that cycle helmets were turning what would have been focal head injuries, perhaps with an associated skull fracture, into much more debilitating global head injuries. We had a couple of examples on the ward at the time, and it was a bit worrying. However, I wasn't too convinced as I figured that the injuries that would previously have been focal head injuries may well have been resulting in death, so the neurosurgeon was never actually seeing them. Instead, they were making their way straight to the pathologist.

The debate now centres on two issues. First, there is some evidence that, *ceteris paribus,* increases in cycle helmet wearing have not resulted in the anticipated reduction in the frequency and severity of head injuries to cyclists. New Zealand-based research from the early 1990s demonstrated no decline in the percentage of serious head injuries to cyclists as a percentage of all serious cyclist injuries presenting to hospital. Furthermore, there was no apparent difference between bicycle-only and all cycle crashes nor between children and adults. There are a number of factors that may explain this finding e.g. that helmets were not being worn correctly, and further research is clearly needed.

A similar study from the Australian State of Victoria did find a reduction in the percentage of head injuries to all injuries during a period of increasing helmet wearing in the late 1980s. However, this study highlighted the second significant issue in the compulsory helmet debate: it showed a significant decline in the number of children and teenagers cycling. Further work has confirmed this early finding: in the year following the introduction of compulsory helmets, 40% fewer adults and 60% fewer children continued to cycle. The conclusion being drawn is that being made to wear a helmet is enough to put many people – in particular the parents of children – off an activity that is already increasingly dangerous and unpleasant because of the increasing number and worsening behaviour of other road users. Thus 'mandatory legislation' may actually contribute to a decline in cycling and the physical activity-associated public health benefits.

But the central issue is really what people who oppose compulsory cycle helmets have argued all along: that to do so shifts the focus from the real menace – motorised vehicles. They argue that making cyclists wear helmets both implies that cyclists are to blame for the problem of cyclist injuries, and it provides an excuse for doing little else to improve the environment cycling and reduce the risk of injury. Interestingly, research by the European Cycling Federation found that non-cyclists tended to be most in favour of helmets for cyclists! In addition, countries such as Denmark where helmet use is rare have cycle accident (and subsequently) injury rates much lower than those of countries where helmet use is more widespread. Opponents of compulsory helmet legislation may have a point: the accumulating evidence suggests that the reduction in head injuries expected of legislation may not be as large as anticipated in practice - and may in fact be outweighed by the disbenefits because of reduced levels of cycling.

The British Medical Association (BMA) recently addressed the question of cycle helmets. While advising cyclists to wear helmets, the BMA's Board of Education and Science concluded that legislation to make them compulsory is likely to reduce the number of people cycling and would not be in the interests of health overall. However, this recommendation by the BMA polarised opinion judging by subsequent correspondence in the British Medical Journal. Certainly, the whole issue requires a rethink within the context of a broader consideration of what New Zealand is trying to achieve with policies relating to cycling.

Key message

The key message from all this is that transport policies are a key determinant of health and cycling exemplifies this issue. Cycling is arguably the 'perfect' physical activity to promote health for individuals, the community – and the planet. There are relatively good data on the health-related benefits and risks of cycling. Health must be included on the transport policy agenda if gains are going to be made in promoting cycling in New Zealand.

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