Transport, carbon emission reduction and health- the possibility of a virtuous circle?

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Editor note: In this Blog, Caroline Shaw and Simon Hales reflect on the weak evidence on health co-benefits for some 'big' environmental policies, but also highlight that there are many 'no-brainer' actions that can be taken now with likely health and environmental co-benefit. They have recently published a systematic review "Health Co-Benefits of Climate Change Mitigation Policies in the Transport Sector".

The transport sector globally generates about 23% of carbon emissions (about 16% of gross emissions in New Zealand). This is largely dominated by the use of light vehicles (see the pie chart below- note: energy use is a good proxy for carbon emissions in the transport sector). Transport emissions continue to grow rapidly, particularly in emerging economies, and by one account transport could represent half of all global emissions by 2050.

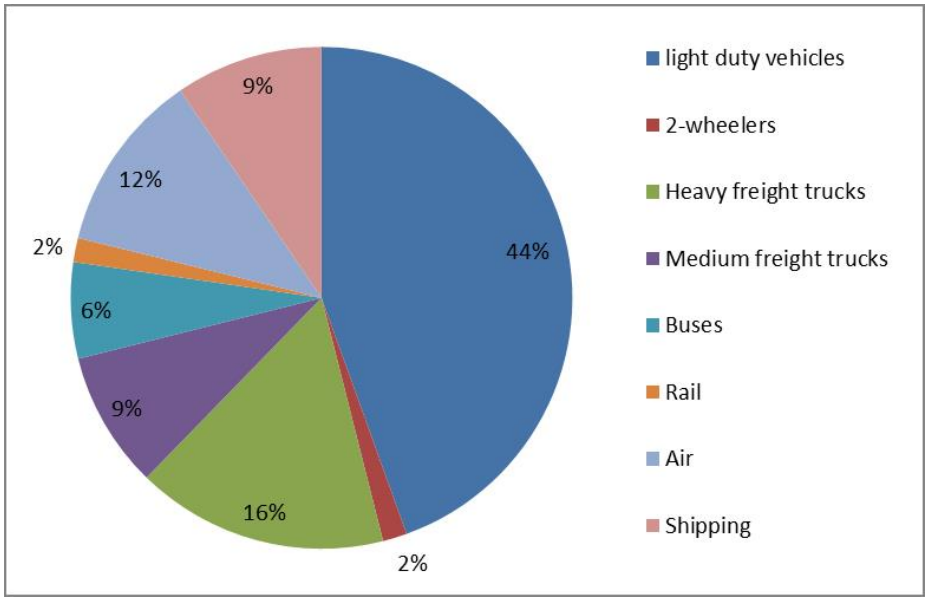
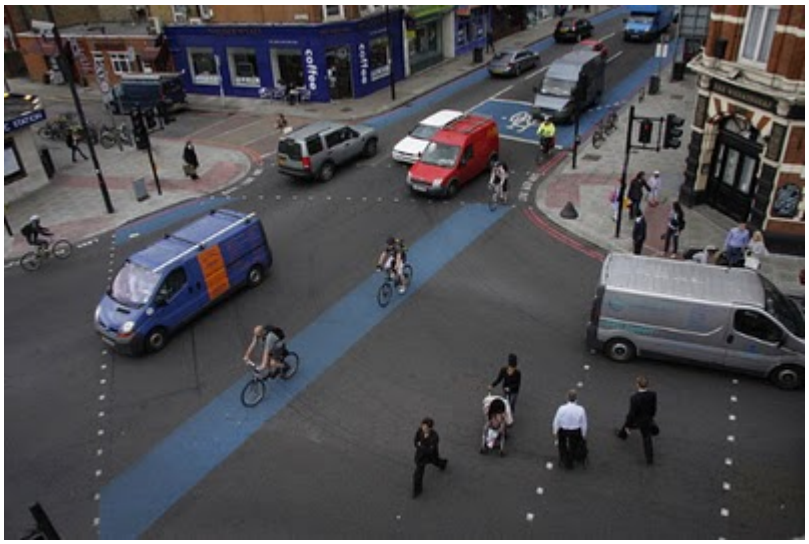


Figure: Global energy use from the transport sector by mode (2000)

Source: Intergovernmental Panel on Climate Change 2007

Transport is also a key environmental determinant of the health of our population, through pathways such as injury, physical inactivity, local and regional air pollution and social capital. Decisions made by transport policy makers and engineers, past and present, shape our cities, homes and even our (expanding) bodies*. These decisions can be explicit or implicit; however the systematic favouring of cars in policy and planning in the last 50 or so years has created cities where walking and cycling are difficult and/or unsafe, air quality can be poor and the social bonds of communities are regarded as less important than new roads.

However we do have potential win-win solution to both of these issues; many of the policies to reduce carbon emissions in the transport sector are also policies with the ability to improve population health. For example policies that promote active transport (walking, cycling and public transport use) will (in theory) reduce car use, decrease greenhouse gas (GHG) emissions, improve air quality, and also promote physical activity in the population.



These positive health spin offs of reducing GHG emissions are known as co-benefits. A lot of research attention has been paid to these in the last few years and a number of papers have used modelling to estimate the health benefits of these policies. One study estimated that if trips under 7km in urban centres in NZ were done on bike rather than by car, this would reduce transport-related greenhouse emissions by 0.4%, prevent 122 deaths annually as a result of increased physical activity and reduced air pollution, and result in about 5 additional deaths due to cyclist fatalities. Another modelling study looking at the outcomes of policies to improve cycling infrastructure in Auckland suggested that with best practice infrastructure 4,000 lives could be saved by 2050 and 26 megatonnes of GHG emissions. The benefit to cost ratio is 25 in the best practice policy scenario.

However it’s not all intersectoral policy nirvana. Firstly, not all transport policies are created equal from a health point of view: some policies are better than others. For example, policies that promote the use of electric cars miss out on the physical activity health benefits (which make up the bulk of the benefits) as well as not doing so well on emission reduction. About a third of GHG emissions from cars are generated during manufacture, rather than the extraction, refining transport and burning of petrol to power them. Secondly, some policies can do harm, for example changing to a predominately diesel car fleet may reduce your GHG emissions but, as seen in Europe, can worsen urban air

pollution. Similarly, converting to biofuels may worsen air pollution and associated health effects as well as increasing global food prices and worsening food insecurity.

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Health co-benefits of climate change mitigation policies in the transport sector

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Secondly, the “real life” evidence to support co-benefits is a bit thin on the ground. We undertook a systematic review looking at policies and interventions that had actually been implemented, rather than modelled like most of the previous research. We found there were very few papers that looked at actual interventions and measured both emissions and health outcomes.

The studies that were available were mostly very poor quality, and they largely focussed on interventions at an individual level (e.g. personalised travel planning which tries to encourage individuals to walk and cycle and use public transport) which, in the context of a car-centric society, will almost certainly have limited impact. Good evidence for “real life” co-benefits was found in a trial of an urban congestion charge in Stockholm. Making motorists pay a daily fee to drive in central Stockholm reduced traffic by 15%, city-wide GHG emissions by 2.7% and (conservatively) saves 27 lives per year due to reductions in air pollution.

We found a surprising lack of observational research on the types of interventions which we think could have the most effect on emissions and health, such as taxes, emissions trading schemes and big infrastructure projects to promote cycling and walking.

Where do we go from here? We urgently need more research in this area (yes we do appreciate that this is a cliché). We need to prioritise evaluating transport sector

interventions for their health and GHG emission impacts – and these evaluations need to use good quality methods. However this is an area where the research must happen concurrently with action – so called evidence genearitng policy. Policies that focus on reducing car use are a good place to start – we can be moderately confident of a virtuous circle of reduced emissions and better health from approaches such large investment in infrastructure to promote active travel (rather than the ad-hoc minimalist approaches currently favoured in NZ). However, these policies need to be carefully monitored for their impacts on inequalities in health. Policy in areas such as shipping and air travel need to be approached more carefully as the approaches to reduce carbon are less clear, even if health benefits are apparent. We need to start the process of transforming our transport system to de-carbonise it, and the chance to achieve other policy goals simultaneously with de-carbonising should not be missed. Many of the actions required to start the process of decarbonising our transport sector are not rocket science, but they require a quality that seems to be in short supply in this area: political will.

*See “The Energy Glut: the Politics of Fatness in an Overheating World” by Ian Roberts for a comprehensive discussion of these issues.

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