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zhussain@bmj.com
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How cars take lives in more ways than just crashes

A New Zealand study has shown how cars take lives beyond just traffic accidents. Zainab Hussain reports

Zainab Hussain *journalist intern*

It is no secret that man made chemical emissions pose risks to human health, but nitrogen dioxide and particulate matter produced by cars are ailing and killing people every day.

While nitrogen dioxide comes from motor vehicle emissions, particulate matter is a result ofvehicles, specifically tyres, and brakeware. According to the Health and Air Pollution in New Zealand (Hapinz) study, based on the latest available complete data (from 2016) and published earlier this year,[1] in 2016 alone nitrogen dioxide emissions have caused 2000 premature deaths, 2000 cardiovascular related hospital admissions, 6500 respiratory related hospital admissions, and an asthma prevalence of 13 200 every year. Meanwhile, particulate matter caused 1300 premature deaths, 2600 cardiovascular related hospital admissions, and 2000 respiratory illnesses. The researchers estimated that in total this has created 1.745 million restricted activity days (defined by the study as "days on which people could not do the things they might otherwise have done if air pollution had not been present").

Samuel Cai, a lecturer in environmental epidemiology at the University of Leicester, says that though the figures might seem low compared with the UK and other European countries, they have led to a "profound finding."

"The report says that 3300 deaths would represent about 11% of total deaths in New Zealand in 2016. That is remarkable because it means that roughly one in 10 deaths can be linked directly to air pollution."

"Also, the impacts of nitrogen dioxide appear much higher than that of particulate matter when it comes to overall mortality," he says. "And for respiratory diseases and hospital admissions, rates are almost three times higher for nitrogen dioxide.

"Sometimes both these air pollutants are highly correlated but now there is evidence to show that nitrogen dioxide does have independent effects on mortality and on other diseases, such as respiratory diseases."

Gerda Kuschel, Hapinz lead researcher and chemical and materials' engineer, says, "We didn't know how bad it was. The total number number of deaths is still horrifying.

"But at least we're now aware of what is truly going on, and I would hope to see that number reduce."

Avoid, shift, and improve

Kuschel says that in New Zealand the framework for tackling car pollution is "avoid, shift, improve."

"If you can avoid the trip, you do that; if you can shift to transport that is less polluting, that's good; and if you can't, you try and improve efficiency—such as taking a diesel bus and making it electric."

Sandra Green, Car Free Birmingham campaigner for climate charity Possible, says, "We used to think cars only killed people if they crashed into them, but now we know that motor traffic threatens our health in many more ways." She points to a 2019 study in Bristol which showed that a child born in 2011 could die up to six months earlier if exposed to such pollution throughout their lifetime.[2]

Jess Berentson-Shaw, a research associate at the Public Policy Institute at the University of Auckland and another collaborator on the Hapinz study, says it is for government to implement changes effectively and quickly.

"In New Zealand, communities are working hard to overcome these problems. In South Auckland, for example, there are a number of community initiatives to provide bikes and e-bikes, as well as the means to service them—but that isn't going to get people out of their cars at the scale we need," she says.

"Without people in government providing more options in terms of public transport, calmer streets, denser urban centres, and protected cycle networks—to ensure children and women, especially, can use bikes to get around and be protected—it is very hard for people on low incomes, those with multiple jobs, students, children, older people, and disabled people to travel across their own streets."

Cai agrees. "Policy would be the most effective way to reduce air pollution exposure and protect public health."

Policy in action

In 2019 London mayor Sadiq Khan introduced an ultra low emission zone across parts of the capital; this operates 24 hours a day, seven days a week. It restricts cars that do not meet certain emission standards from entering the designated zones.

School Streets is another initiative that operates across London. At certain times of the day it restricts cars from entering roads where schools are located, to help protect children physically and from car emissions. The UK government also wants to ban the sales of new petrol and diesel cars by 2030.

Brussels has introduced a regional mobility plan that focuses on providing efficient public transport and spaces to encourage walking and cycling, while also meeting the physical needs of local people. Actions being taken include redeveloping some roads into

multimodal urban boulevards, creating pedestrian lines to link regional hubs, and developing a network of privileged cycle routes. Other plans include reducing the need for a personal car and encouraging car sharing and carpooling.

The incentives for such action are clear—with the high rates of hospital admissions and mortalities there is a great financial burden. Hapinz estimates that the cost of health impacts of man made air pollution in New Zealand alone came to a total of NZ$15.6bn.

Cai says, "We all know that air pollution is a major health hazard for most of the population. This figure considers the direct effect of air pollution on the health system, but also loss of life and reduced quality of life because of the diseases associated with air pollution, as well as loss of productivity."

Kuschel says she went through a range of emotions when analysing the figures, "We really did not—and nor did anybody else—expect the impacts of air pollution to be this bad.

"I suppose I've become more hopeful—mortality and the numbers around health impacts are very high and if this doesn't get people to start tackling vehicle emissions seriously, I don't know what will."

1 Kuschel G, Metcalfe J, Sridhar S, et al. Health and air pollution in New Zealand 2016 (Hapinz 3.0): findings and implications. Ministry for the Environment. 6 July 2022. https://environment.govt.nz/publications/health-and-air-pollution-in-new-zealand-2016-findings-and-implications

2 Dajnak D, Walton H, Beevers S. Bristol City Health and Economic Impact Assessment study. UK100 18 November 2019. www.uk100.org/sites/default/files/publications/Bristol-City-Health-and-Economic-Impact-Assessment-study.pdf