How responding to climate change might affect health, for better or for worse - the example of cities

Alistair Woodward, School of Population Health, University of Auckland

Cities occupy a tiny fraction of the Earth, less than 2 percent of the planet's surface area, but account for about 70 percent of global CO2 emissions. The vibrancy and opportunity of urban life have attracted more than half the world's people, but there are also many negative aspects of cities – pollution, crowding and wide inequalities, for instance. And, in general, the health of human populations, including those in cities, has improved hugely in the last century, but preventable disease and injury and lost well-being are still common.

The carbon footprints of cities will need to shrink substantially to meet the climate targets agreed at Paris. Certainly there are opportunities to simultaneously reduce emissions and improve health, but win-win outcomes are not guaranteed.

There are many ways in which low carbon policies may in fact be health neutral or health damaging. Land use and urban form and transport are just two examples. There are many others, such as housing, food systems, industrial processes and urban energy – we depend on wise choices in all these domains to achieve just and health-promoting transitions to climate safety.

So, is it possible to respond to climate change in ways that will simultaneously make cities more successful and improve human health? It is, but full alignment is not guaranteed. Here are two examples.

Land use and urban form shape the operation of cities, including environmental impacts and social consequences. A critical parameter is density. We know that compact cities tend to use less energy per capita and release fewer greenhouse emissions. In well-designed cities[1], residential density brings other benefits, including increased opportunities for social interactions, nature contact and incidental physical activity (such as walking and cycling).

In American cities, recent work on the spread of COVID-19 finds that higher density may also be associated with slower transmission of infection. This apparently counter-intuitive finding is explained by differences in mixing patterns – those who reside in low density suburbs typically travel further and interact with a greater variety of fellow citizens, and

[1] 'in well-designed cities' is an important caveat – poorly executed urban density will likely not achieve multiple benefits.

therefore have the capacity to propagate infection more rapidly. Residents of high density inner city areas are more likely to use local facilities and mix mostly with others in the same part of the city.

In a report for the Australian Heart Foundation, Billie Giles-Corti and colleagues recommended steps to be taken to maximise the health benefits of greater urban density while minimising the harms. These include separating housing from arterial roads, making noise reduction a priority in planning and design, limiting the height of high-rise housing, providing high quality local amenities, and avoiding neighbourhood injury hazards (e.g. curb parking, poor lighting, unkept and obstructed public places, high traffic speeds and volumes). With lack of forethought and poor design, density leads to crowding, which is generally health-damaging, but the two don't necessarily go together.

Thirty eight per cent of Auckland's greenhouse emissions are caused by road transport, and the city's Climate Action Plan requires these emissions are halved, at least, by 2030. (A 70% reduction may be needed in fact if other sectors such as agriculture cannot make deep cuts quickly.) Cities all round the world are in a similar position – road transport is one of the largest sources of emissions, it is the most rapidly growing source, and it is, in theory, where gains can be made most rapidly because the causes are obvious and there are remedies at hand.

Electric cars are frequently cited as the obvious means to de-carbonize transport, especially in countries like New Zealand where power is most generated by renewable sources. However, electric cars do not improve the efficiency and safety of cities, since congestion is not a function of the fuel that drives the vehicle. And electric cars do little for health. The improvements in air pollution and noise are slight, and there are no gains in physical activity, which is the biggest contributor to transport-induced mortality and morbidity.

Transport researchers have examined the changes in disease burden for different carbon-saving road transport policies. One such study of London compared a 2030 business as usual future with three low carbon scenarios – more trips by low emission vehicles, increased active travel, and a combination of the first two. For similar carbon savings, the low emission vehicle scenario saved 160 Disability Adjusted Life Years (DALYs) per million people per year in 2030; the active travel and combined scenarios saved about 7300 DALYs per million.

Climate mitigation policies that increase the acceptability, appeal, and safety of active urban travel, and discourage travel in private motor vehicles will provide larger health benefits than those policies that focus solely on lower-emission motor vehicles.