The Lancet Series: How city design and transport planning can improve health

- ***Case studies of Melbourne, London, Boston, Sao Paulo, Copenhagen and Delhi suggest that changes to city design and transport can have significant impact on health***
- ***Changes in Melbourne, London and Boston to promote cycling and walking must be matched by provision of safe infrastructure for cyclists and pedestrians***

A new Series, published in *The Lancet* quantifies the health gains that could be achieved if cities incentivised a shift from private car use to cycling and walking, and promoted a compact city model where distances to shops and facilities, including public transport, are shorter and within walking distance.

These changes could achieve significant reductions in non-communicable diseases such as cardiovascular disease and diabetes as well as increasing physical activity and reducing pollution. Importantly, in cities with high levels of private car use such as Melbourne, London and Boston, the authors say that promoting walking and cycling must be matched by improvements to infrastructure that separate motorised transport to protect cyclists and pedestrians from road injuries.

The new Series on urban design, transport and health, led by the University of Melbourne (Australia) and the University of California, San Diego (USA), launched Friday, September 23rd at an event at the United Nations General Assembly (UNGA) in New York.

Over half of the world's population live in cities, and rapid urbanisation is only expected to increase in the coming years. By 2050, large cities in the USA, China and India are predicted to see their populations increase by 33%, 38% and 96% respectively. Population growth in cities means increasing demands on transport systems. Sprawling residential developments in the USA, Australia and New Zealand limit the ability of people to walk or cycle in their daily commute and make public transport expensive to deliver. Private car use has increased dramatically in Brazil, China and India leading to declines in physical activity, increases in air pollution and increased rates of road death and serious injury, all of which combine to increase overall levels of chronic disease and injury.

"With the world's population estimated to reach 10 billion people by 2050, and three quarters of this population living in cities, city planning must be part of a comprehensive solution to tackling adverse health outcomes. City planning was key to cutting infectious disease outbreaks in the 19th century through improved sanitation, housing and separating residential and industrial areas. Today, there is a real opportunity for city planning to reduce non-communicable diseases and road trauma and to promote health and wellbeing more broadly," says Series author Professor Billie Giles-Corti, University of Melbourne, Australia [1].

The authors of the Series identify key interventions that, when combined, encourage walking, cycling and public transport use, while reducing private car use (paper 1, table 1). These include having shops and services within walking distance, a mix of employment and housing across the city, reducing the availability and increasing the cost of parking, infrastructure that supports safe walking and bicycling, open spaces, reducing distance to public transport, and making neighbourhoods safe, attractive and convenient for public transport.

“We concluded that focusing on walking and cycling infrastructure alone is critical but not enough – to create cities that promote health needs joined-up policies and input across multiple sectors: land use, transport, housing, economic development, urban design, health and community services, and public safety” adds Professor Giles-Corti.

Series lead Professor Mark Stevenson, University of Melbourne, and colleagues designed a ‘compact cities model’ where land-use density was increased by 30%, average distance to public transport reduced by 30%, and diversity of land-use increased by 30%. They also factored in a 10% shift from private cars to either cycling or walking - a target similar to that of policies in many European cities such as Zurich. These targets were selected on the basis that they are pragmatic in most cities – for instance in Melbourne approximately 14% of private motorised vehicle trips are for trips of less than 5km and therefore a shift from car to active commuting (walking combined with public transport) for example would be feasible.

The model was applied to six cities: Melbourne, London, Boston, Sao Paulo, Copenhagen and Delhi. Health gains were predicted in all cities (table 4), with the greatest effect on reducing rates of cardiovascular disease. In addition, all cities saw increases in physical activity and reductions in air pollution from transport emissions (table 3).

In Melbourne, the model led to an estimated reduction of 19% in the burden of cardiovascular disease and 14% in the burden of type 2 diabetes. In London, the model led to a reduction of 13% in the burden of cardiovascular disease and 7% in type 2 diabetes. In Boston, the reductions were 15% and 11% respectively (table 2 & 4 [2]).

The model also predicted an increase in road traffic incidents for cyclists and pedestrians – an increase of approximately 6% in Melbourne (257 additional road injuries and 10 deaths per year), 10% in London (292 injuries; 12 deaths) and 5% in Boston (55 injuries; 2 deaths) (figure 5). However, separating pedestrian and cycling from cars was found to offset the increased road injuries and deaths (figure 7).

“The effect of interventions that encourage cycling and walking was particularly evident in highly motorised cities such as Melbourne, London and Boston, and underscores the importance of transport policies, pricing and regulation that encourage active transport via cycling, walking and public transport while discouraging private car use. These changes also need to be matched by improved pedestrian and cycling infrastructure to protect cyclists and pedestrians. Our study shows that these changes at city level could lead to real health gains,” says Series author Professor Mark Stevenson [1].

Several cities have made progress in increasing walking and cycling including London, Stockholm and Bogota (paper 3, panel 3) – for instance, motor vehicle traffic volumes across London decreased by 7% between 2004 and 2014 and cycling has increased, despite a growing population. But the authors warn that much more should be done to improve the health of cities.

"City planning policies can affect health, both positively and negatively. Sadly, it is clear that many city leaders around the world are not applying the lessons of research to make cities as healthy as possible. A continuing challenge is to improve the communication of this evidence to city leaders and find incentives for them to seek out and apply the evidence. A major incentive is that designing cities for health and active transport, rather than automobile-dependence, also makes the cities more

environmentally sustainable helping cities to achieve the UN's Sustainable Development Goals," says Series author Professor James Sallis, University of California, San Diego, USA [1].

In a linked Comment, Bill de Blasio, Mayor of New York City, emphasizes the value of parks in designing cities, he writes: "Today, the City of New York is using the power of green spaces to strengthen the overall health of our thriving metropolis, especially in low-income neighbourhoods that are grappling with health disparities… For everyone to reap the full benefits of our parks, we must invest in them wisely… A person's access to a great park, and, by extension, to potential health benefits, should not be determined by his or her zip code."

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NOTES TO EDITORS
[1] Quotes direct from authors and cannot be found in the text of the Series.
[2] Predicted health gains were measured in DALYs (disability-adjusted life years) per 100000 population. For example, in Melbourne the compact cities model led to a health gain equivalent to 622 DALYs per 100000 population for cardiovascular disease (see table 4) – equivalent to 19% of the overall burden of cardiovascular disease in the city (3277 DALYs per 100000 population, table 2)

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Please note co-authors from the UK, Brazil, India, Canada, and the USA are also available, please contact Rees Quilford

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