Editorial JTH 16 –The Coronavirus Disease COVID-19 and implications for transport and health

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Introduction

When I took over the editorial duties of Journal of Transport & Health from Professor Jenny Mindell January this year I had not foreseen this first editorial would be written while the world is in such unprecedented state of emergency. To this end, I've asked two Associate Editors of *the Journal of Transport & Health*, Professor Erel Avineri, Head, Afeka Center for Infrastructure, Transportation and Logistics, Tel-Aviv Academic College of Engineering, and Professor Yusak Susilo, BMK Endowed Professor in Digitalisation and Automation in Transport and Mobility System at the Institute of Transport Studies, the University for Natural Resources and Sciences (BOKU), Vienna, to write a special review of transport and health in relation to the spread of the Coronavirus Disease Covid-19.

Following the global outbreak of the Coronavirus Disease (COVID-19) generated by the novel human Coronavirus SARS-CoV-2, countries across the world are taking measures in order to reduce the effects or at least to slow it down in order to better cope with public health and better manage its limited resources. Human-to-human transmissions of SARS-CoV-2 have been described with incubation times between 2-10 days, facilitating its spread via droplets, contaminated hands or surfaces (Kampf et al., 2020). While limited knowledge is available about the SARS-CoV-2 virus, we have some experience with other infectious diseases that might have some similar characteristics.

Hypermobility and spread of disease

Relevant to transport and health is how our hypermobile society spreads such a disease so quickly. Despite the early evidence to show that the human-to-human transmission of rates of COVID-19 is lower than SARS (Cascella et al., 2020), compared with its respiratory disease family, SARS and MERS, Peeri et al. (2020) show that COVID-19 has spread more rapidly, due in part to increased globalisation and the first epicentre's (Wuhan) accessibility. Wu, J.T. et al. (2020) argue that the abundance of connecting flights, the timing of the outbreak during the Chinese New Year, and the extraordinary rail accessibility of Wuhan to the rest of China has enabled the virus to spread throughout the country, and eventually, globally, in a very short time.

We are so connected to one another across the globe for work, for leisure and to stay connected to families and friends. The success of our transport system in terms of mobility and safety means we've become used to taking long haul flights and round the world cruises with little regard for potential negative side effects. Data from Statistica 2020, show that the number of passengers on scheduled commercial airlines have increased 137% in the past

15 years (Mazareanu, 2020). Although the spread of the SARS-CoV-2 coronavirus has been warned about in the past, the timing and trajectory of it is something very hard to predict. But we have become so blasé to the negative side effects of large scale travel and mobility that we consider it normal to do long journeys and expect little to no negative externalities or that someone else is taking care of those, whether they are pollution, injuries, or the break-up of local communities.

Effects of curtailing transport

In addition, we see the mass consequences of having to curtail mobility with many countries introducing lock-downs with significant repercussions for work, but also for fulfilling everyday duties, getting shopping in and seeing friends and family. Who knows at the moment how long such a lock down will last in many countries, and further what effect it will have on changing our mobility patterns forever. Will we get used to virtual meetings being the norm for office workers, will we want to connect to local communities more than those far away, will we notice and enjoy cleaner air from less pollution in reduction in transport movement and want to sustain this afterwards? But, given the benefits of mobility are not distributed equally, the disbenefits of mobility lock-down are likely to be faced differently by different populations. People who rely on medicine being delivered or on accessing health and care services, those not connected to the internet, those who live day-to-day, those in more isolated and rural areas, but also those unable to escape those around them living in high density with others, are going to be disproportionally affected. Those that rely on mobility for their work and business may not be able to make ends meet, with jobs at risk without financial support and help from their government, particularly in the Global South, where they are often a substantial percentage (30% or more) of the working population.

To mitigate these negative effects, robust disease control and prevention planning is becoming more important than ever as globalisation and climate change will make the occurrence of new disease more common in the future (e.g. Cho, 2014; Baker et al. 2019). Further, desperately needed are more robust, evidence-driven transport-based interventions, based on understanding the effectiveness of each, in particular as so much modern individuals 'livelihood now are intertwined with the human interactions and economic activities in urban areas, where transport and mobility system, including public transport, are the veins of these exchanges, both for the good/productive ones and the bad/destructive ones.

Public transport

Epidemiologists believe the SARS-CoV-2 virus can live for hours or even days on hard surfaces. The analysis of 22 studies, reviewed in Kampf et al. (2020), reveals that human coronaviruses such as Severe Acute Respiratory Syndrome (SARS) coronavirus, Middle East Respiratory Syndrome (MERS) coronavirus or endemic human coronaviruses (HCoV) can persist on inanimate surfaces like metal, glass or plastic for up to 9 days (at a temperature of 30°C or more the duration of persistence is shorter). In a recent correspondence van Doremalen et al. (2020) report on findings that suggest that the aerosol and surface stability of SARS-CoV-2 was similar to that of SARS-CoV-1 (which causes SARS), the most closely related human coronavirus (Wu, A. et al., 2020), under the experimental circumstances tested. Human coronaviruses can, however, be efficiently inactivated by surface disinfection procedures with 62–71% ethanol, 0.5% hydrogen peroxide or 0.1% sodium hypochlorite within 1 minute (Kampf et al., 2020). A similar effect against the SARS-CoV-2 may be expected, and preliminary research supports this. As no specific therapies are available for SARS-CoV-2, Kampf et al. (2020) suggest that early containment and prevention of further spread will be crucial to stop the ongoing outbreak and to control this novel infectious thread.

Public transportation vehicles (busses, trams, rails and metros) are used daily by millions of people; often they carry passengers above their capacity, especially commuters in morning and evening peak hours. This might contribute to the spread of diseases among public transport users. For example, there is an association between acute respiratory infection (ARI) in winter and bus or tram use in the five days before symptom onset (Troko et al., 2011). During the COVID-19 outbreak, as in previous epidemics and pandemics, epidemiologists are encouraging social distancing, meaning people should keep about six feet (or 2 meters) or more apart from others. This measure is obviously in conflict with the concept of public transportation.

The greatest risk for infectious diseases in public transportation is that people sit or stand in proximity in a closed environment (Edelson and Phypers 2011). These vehicles can become a significant source of microorganisms when passengers do not close their mouths when coughing and sneezing. Handrails, ticket machines, smart-card machines, doors, handles, windows, panels, floors, elevators and seats are areas that can host infectious microorganisms.

Following studies in Epidemiology, one of the common measures provided by the authorities is internal cleaning and sanitation of public transportation vehicles. In many cities, they are disinfecting handrails, ticket machines, doors, handles, windows, panels, elevators and seats more frequently. They are also spraying buses frequently. Another measure taken by some authorities is installing hand sanitizing units inside public transportation facilities. It is unclear whether these measures provide protection at the desired level. Also, it is questionable whether frequent cleaning and sanitation by staff is sustainable over time, as it demands much human resources and its logistics might be complicated.

Although it was found that the use of crowded public transport vehicles can be associated with the acquisition of infectious diseases, it can be argued that these findings do not support the effectiveness of suspending mass urban transport systems as a pandemic countermeasure aimed at reducing or slowing population spread because, whatever the relevance of public transport is to individual-level risk, household exposure most likely poses a greater threat (Williams et al., 2010; Cooley et al., 2011).

Walking and cycling

We cover many articles on active travel in this issue. At the moment we realise continuing to be active is important for health and wellbeing but evidence from places with lock-down is that exercise and in some cases leisure walking and cycling is banned or heavily discouraged. We know how important active travel is for health. Regular walking or cycling reduces the risk a variety of long-term conditions including coronary heart disease, stroke, cancer, obesity and type 2 diabetes (NICE, 2013), reducing the risk of cardiovascular disease by around 30% and all-cause mortality by 20% (Hamer and Chider, 2008). Hence we would hope that while retaining social distancing that some forms of active mobility can be maintained for as long as possible. An open signed letter to the UK government has stated walking and cycling to be socially compatible with social distancing (Woodcock et al., 2020).

Contrasting with information from Latin America, where cycling for mobility has risen steadily in the past decade, often driven by higher cycling among women, and sustained by traditions of working class and low-income cycling in many places, evidence from the US from Buehler et al. (this issue) suggests while national rates of daily walking rose slightly from 2001 to 2017, cycling rates remained unchanged. Walking and cycling were highest among well-educated persons, households with low car ownership, and residents of high-density neighbourhoods. They note men were three times more likely to cycle. Similarly, McKay in this issue found boys are more likely to cycle than girls, and early training at around 10 or 11 years of age doesn't impact on later cycling rates. Reilly et al suggest those taking up shared bike schemes such as New York's CitiBike scheme tend to be young and male and often already physically active being motivated by saving money and getting around quicker, more than physical activity. Could more localised mobility be the norm following enforced isolation or will we go back to normal levels of mobility?

The environment plays a role in sustaining active travel from a young age. One reason for a lack of walking and cycling is that the environment simply is not conducive to it. Ozbil et al (in this iusse) note that while children who actively commute to and from school have lower Body Mass Index (BMI), street connectivity may actually be even more important to maintaining it. Cambra and Moura (in this issue) suggest changes in walking levels follow the magnitude of change in walkability of any interventions put in place. Many cyclists might choose low density roads regardless of their speed limits, yet findings from Vanparijs et al. suggest this is dangerous when such roads have high speed limits as they pose a high risk of road traffic collision despite not having high levels of traffic on the roads. Maybe this pause in hypermobility caused by the coronovrus gives us chance to rethink how we shape our environment to keep us connected more locally and what role active travel has within that.

More issues to think about

This COVID-19 outbreak also highlights the importance of rethinking of the basic design of social and economic resilience, in particular for disadvantaged poorer and rural communities, in such disruptive event. How do we keep people connected and active when literal or corporeal mobility ceases. Virtual mobility is an obvious solution, using technologies to substitute literal mobility, connecting people through online sharing – but again, this solution is only available to those who either have jobs that can be done from a distance or who are able to afford and use such solution. Further, the reduction impact of such solutions in mobility is not always as apparent as shifting activity online sometimes only moves actors around. In e-shopping, for example, it creates more delivery people than shop workers, changing mobility patterns rather than eliminating them.

Reducing hypermobility of our transport networking and focussing on local connectivity seems a reasonable solution from this. If we are to face increasing threat from viruses we need to have strong social and local economic capital in strong local communities and neighbourhoods to support one another without recourse to hypermobility. Perhaps a move to a more sustainable hypomobile practice is desired, a slow mobility focus, with more localised active mobility. Perhaps we'll all realise being closer to home is desirable, that social contact is vital, and we save our hypermobility for nothing but essential times. The positive advantages for transport and health in an increase in active travel, reduction in pollution, fewer road traffic injuries and reduced community severance and associated isolation would be hugely welcome; whilst of course, the temptations of economic, social, and cultural advantages of globalisation will very difficult, if not impossible, to ignore.

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