

# On the relationships between COVID-19 and extended urbanization

Dialogues in Human Geography  
1–4

© The Author(s) 2020

Article reuse guidelines:

[sagepub.com/journals-permissions](https://sagepub.com/journals-permissions)

DOI: 10.1177/2043820620934209

[journals.sagepub.com/home/dhg](https://journals.sagepub.com/home/dhg)**Creighton Connolly**

University of Lincoln, UK

**S Harris Ali**

York University, Canada

**Roger Keil**

York University, Canada

## Abstract

This commentary focuses on the relationship between extensive forms of urbanization and emerging infectious disease, using empirical examples from the COVID-19 pandemic. Specifically, it examines the role of shifting urban-ecological relationships, infrastructures, and governance dynamics in both giving rise to, and mitigating, the impact of infectious disease outbreaks.

## Keywords

COVID-19, extended urbanization, governance, infrastructure, infectious disease

## Introduction

We are now a majority urban species which poses new questions and challenges for the design of cities, transportation networks, and responding to outbreaks of emerging infectious diseases (Connolly et al., 2020; Wolf, 2016). The COVID-19 pandemic has thrown these developments into even sharper view, especially with the accelerated extension of urban processes and forms into regions that had previously not been urbanized as well as heightened inter-urban connectivity. Much of this expansion has occurred in Asia and Africa, which has led to newly emerging diseases, including the Ebola Virus Disease (EVD) in West Africa and the Democratic

Republic of the Congo (Richards et al., 2015). We are also seeing more peri-urban and regional connections between a larger network of cities that make it much more difficult to contain disease outbreaks.

To control the spread of emerging infectious diseases today, we thus need to more effectively study the landscapes of extended urbanization. This includes discerning where infectious disease

---

### Corresponding author:

Creighton Connolly, School of Geography, Think Tank (office 1016) Ruston Way, University of Lincoln, Lincoln, LN6 7TS, UK.  
Email: [cconnolly@lincoln.ac.uk](mailto:cconnolly@lincoln.ac.uk)

outbreaks occur and how they relate to the relationship between human beings and the environment as well as the interface between the rural and suburban. Our commentary will suggest three specific areas of focus that can be taken up by geographers and other researchers in addressing this pressing issue: shifting urban ecologies, emerging infrastructure networks, and urban governance dynamics.

### **Shifting urban ecologies**

First, our recent research has thus illustrated how a landscape political ecology framework can be useful for examining the role of socio-ecological transformations in generating increased risk of infectious disease in peri-urban and suburban areas (Connolly et al., 2020). For instance, SARS-CoV-2 (the virus responsible for COVID-19) allegedly crossed the animal-human divide at a seafood market in Wuhan: one of the largest Chinese cities and a major transportation node with national and international connections (Decaro and Lorusso, 2020). Other new infectious disease epidemics that have emerged over the past two decades, like Middle East Respiratory Syndrome (MERS) and the H1N1 influenza pandemic of 2009, suggest that the emergence of pathogenetic zoonoses in rapidly developing and urbanizing regions appears to have become a paradigmatic component of urbanization and globalization processes in the 21st century (Decaro and Lorusso, 2020; Voelkner, 2019). As Wilcox and Gubler (2005: 263) have previously argued, this points to the need for interdisciplinary research focused on ‘social and ecological factors affecting infectious disease emergence’, which is still an area of high importance. Examples include deforestation on the edges of cities and new agro-industrial transformation of hinterlands, producing new pathways of emergent infectious disease transmission (Yong, 2018).

### **Emerging infrastructure networks**

Second, we argue that rapidly expanding infrastructure networks and urban landscapes can themselves play a role in the emergence of potential outbreaks. Transportation and infrastructure networks can be

central to the spread of infectious disease while also affecting the ability for cities to respond to new outbreaks (Heymann and Shindo, 2020). The fact that the global aviation industry has confounded the ability to contain disease outbreaks has been well established since the SARS crisis of 2003 (Ali and Keil, 2010). But we also need to look beyond airports to transnational manufacturing networks, Chinese-financed Belt and Road infrastructure across Asia and Africa, and in global and regional transportation hubs like Wuhan. Indeed, as Wilcox and Colwell (2005: 248) note, ‘dramatic changes in demographic and social conditions, including an exponential increase in global transport, are responsible for much of the global emerging infectious disease problem’.

Socio-material disconnections are also revealed as rapid urban growth is not accompanied by the appropriate development of social and technical infrastructures. This includes access to clean water supplies, which are essential for combating the spread of infectious disease, but are often lacking in rapidly growing informal settlements in the Global South and parts of the Global North (Acuto, 2020). Migration, urbanization, and socioeconomic conditions have thus been identified as barriers to the effective control of diseases, especially in the Global South (Spencer et al., 2020). This also raises questions about how urban design strategies can be reformulated to cope with increasing densities in the age of pandemics.

Building capacity of medical infrastructures is crucial, including stockpiles of medical supplies and developing plans to increase surge capacity in hospitals and other facilities so that these issues do not need to be worked out during a pandemic (Matthew and McDonald, 2006). This is an issue that city-states like Singapore and Hong Kong had focused on after their previous experience with SARS, which left a permanent imprint on the public imaginary in these cities (Voelkner, 2019). The use of exhibition halls as makeshift hospitals is a strategy that has been used effectively in cities like Wuhan and Vancouver in the current COVID-19 pandemic (Little, 2020).

Information networks and digital infrastructures are also important factors that may influence the

response to pandemics in particular ways. The internet, social media, and mobile phone applications are now superseding traditional media in influence, both positively and negatively (Matthew and McDonald, 2006). For example, civilians in Hong Kong and Singapore developed websites with the use of publicly available information about the outbreak (e.g. hotspots and infection data) in both places (see Covid19 SG, 2020). This provided very detailed geo-spatial information about COVID-19 transmission that was useful for the government's response and influencing people's behavior. Mobile phone applications developed in Singapore, Hong Kong, and Taiwan to track the movements of infected people, and inform other users about their risk, have also been effective in containing the outbreak (Acuto, 2020). Yet, social media has also created obstacles to effective responses. This is because social media platforms have led to public confusion about what sources of information are reliable as unverified rumors and exaggerated claims can reach a broad audience in real time, effectively outpacing information dissemination by public health officials (Ali and Kurasawa, 2020).

### Urban governance dynamics

Finally, we need to investigate the role of urban and regional governance networks in responding to challenges posed by COVID-19 across jurisdictions and scales. Urbanization has posed growing challenges to global health governance due to the deeply political nature of health policies and planning decisions (Fidler, 2020). This can be seen in the conflicts between different levels of government in the United States, as governors have competed over limited resources and adopted different measures to control the spread of the virus (Fidler, 2020; Foster, 2020). Multilevel government frictions in health governance are conditioned, additionally, by the existing deterioration of public health infrastructure, emphasis on emergency response as opposed to prevention, and associated complacency within some countries (Wilcox and Colwell, 2005). Some time ago, Matthew and McDonald (2006: 115) already expressed concern that 'public officials are not acting quickly and decisively to take the

common sense steps that could prevent dangerous situations from spiralling into disaster'. This has certainly been seen in the current COVID-19 pandemic in countries like the United Kingdom and United States, which have been slow to take action on preventing and containing the spread of the disease.

As processes of extended urbanization continue to intensify across the world, urban regions will need to develop efficient and innovative methods of confronting emerging infectious disease without relying on drastic top-down state measures that can be globally disruptive and often counter-productive. Research on the 2009 H1N1 pandemic has confirmed the limited value and feasibility of international travel restrictions in containing outbreaks at their source (Bajardi et al., 2011). This can be seen in the case of Singapore during the COVID-19 pandemic, as incidences of local transmission soared after imported cases declined following the closure of the border to foreigners and the implementation of strict self-isolation rules for returning Singaporeans (Covid19 SG, 2020).

### Conclusion

The massive expansion of the global urban fabric over the past few decades has increased exposure to infectious diseases and posed new challenges to the control of outbreaks (Acuto, 2020). COVID-19 has demonstrated how quickly infectious diseases can spread, and how vulnerable every community is. We are also seeing that the disease is exacerbating existing inequalities in society along the lines of class and race disparities, uneven patterns of mobility, access to sanitation infrastructures, and ability to self-isolate. These social and infrastructural imbalances can influence responses to an outbreak, and must be seen as part of the solution to mitigating against future epidemics. Geographers and urbanists will thus need to explore these emerging relationships between extended patterns of urbanization and infectious disease outbreaks through an interdisciplinary approach to prevent and mitigate against future disease outbreaks. This will also require increased co-ordination between researchers, health workers, governments, and the general population.

## Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

## References

- Acuto M (2020) COVID-19: Lessons for an Urban(izing) World. *One Earth*. DOI: 10.1016/j.oneear.2020.04.004.
- Ali SH and Keil R (2010) Securitizing networked flows infectious diseases and airports. In: Graham S (ed.) *Disrupted Cities When Infrastructure Fails*. New York: Routledge, pp. 97–110.
- Ali SH and Kurasawa F (2020) #COVID19: social media both a blessing and a curse during coronavirus pandemic. *The Conversation*, 22 March. Available at: <https://theconversation.com/covid19-social-media-both-a-blessing-and-a-curse-during-coronavirus-pandemic-133596> (accessed 13 May 2020).
- Bajardi P, Poletto C, Ramasco JJ, et al. (2011) Human mobility networks, travel restrictions, and the global spread of 2009 H1N1 pandemic. *PLoS ONE* 6(1): e16591.
- Connolly C, Keil R and Ali SH (2020) Extended urbanisation and the spatialities of infectious disease: demographic change, infrastructure and governance. *Urban Studies*. DOI: 10.1177/0042098020910873.
- Covid19 SG (2020) Dashboard of the COVID-19 virus outbreak in Singapore. Available at: <https://co.vid19.sg/singapore/> (accessed 14 May 2020).
- Decaro N and Lorusso A (2020) Novel human coronavirus (SARS-CoV-2): a lesson from animal coronaviruses. *Veterinary Microbiology* 244: 108693.
- Fidler DP (2020) The world health organization and pandemic politics. *Think Global Health*, April 10. Available at: <https://www.thinkglobalhealth.org/article/world-health-organization-and-pandemic-politics> (accessed 13 May 2020).
- Foster S (2020) As COVID-19 proliferates mayors take response lead, sometimes in conflicts with their governors. *Georgetown Law*. Available at: <https://www.law.georgetown.edu/salpal/as-covid-19-proliferates-mayors-take-response-lead-sometimes-in-conflicts-with-their-governors/> (accessed 13 May 2020).
- Heymann DL and Shindo N (2020) COVID-19: what is next for public health? *The Lancet* 395(10224): 542–545.
- Little S (2020) Coronavirus: Vancouver convention Centre to be converted to makeshift hospital. *Global News*, 30 March. Available at: <https://globalnews.ca/news/6753681/coronavirus-vancouver-convention-centre-hospital/> (accessed 19 April 2020).
- Matthew RA and McDonald B (2006) Cities under siege: urban planning and the threat of infectious disease. *Journal of the American Planning Association* 72(1): 109–117.
- Richards P, Amara J, Ferme MC, et al. (2015) Social pathways for ebola virus disease in rural sierra leone, and some implications for containment. *PLOS Neglected Tropical Diseases* 9(4): e0003567.
- Spencer JH, Finucane ML, Fox JM, et al. (2020) Emerging infectious disease, the household built environment characteristics, and urban planning: evidence on avian influenza in Vietnam. *Landscape and Urban Planning* 193: 103681.
- Voelckner N (2019) Riding the Shi: from infection barriers to the Microbial city. *International Political Sociology* 13(4): 375–391.
- Wilcox BA and Colwell RR (2005) Emerging and reemerging infectious diseases: biocomplexity as an interdisciplinary Paradigm. *EcoHealth* 2(4): 244–257.
- Wilcox BA and Gubler DJ (2005) Disease ecology and the global emergence of zoonotic pathogens. *Environmental Health and Preventative Medicine* 10: 263–272.
- Wolf M (2016) Rethinking urban epidemiology: natures, networks and materialities. *International Journal of Urban and Regional Research* 40(5): 958–982.
- Yong E (2018) The next plague is coming. Is America ready? *The Atlantic*, August. Available at: [https://www.theatlantic.com/magazine/archive/2018/07/when-the-next-plague-hits/561734/?utm\\_source=twb](https://www.theatlantic.com/magazine/archive/2018/07/when-the-next-plague-hits/561734/?utm_source=twb) (accessed 20 May 2020).