Dummy Title

By Dummies

27 JUN 2020

Abstract

On 24 April, 2020, a researcher at MIT released a working paper finding that "The Subways Seeded the Massive Coronavirus Epidemic in New York City". While the analysis in the paper has been called into question, it remains true that the role of public transportation in the spread of COVID-19 is still unknown. In this paper, we introduce an agent-based model of the New York City subway and analyze how well it can predict the spread of COVID-19 through the boroughs of New York City.

Our findings that [insert findings here] should interest public health officials looking to make policy decisions about public transportation.

[Writer's Note: Of course, this is the ideal final result. We will focus on the early infection period and I give it a 50/50 that we even get to taking into account countermeasures and ridership losses. We will make a preliminary model, improve it, and see how far we can get.]

Background

Epidemics and COVID-19

SEIR Model

Newer Compartmental Models

Urban Transportation Networks and Subways

This guy is indispensable for figuring out how to parse some of this data:
https://en.wikipedia.org/wiki/New_York_City_Subway_nomenclature

A Timeline of the Start of COVID-19 in NYC

[Writer's Note: I mean the honest reference is Wikipedia] Feb 25 - Some guy came back from Iran
Mar 3 - First P2P spread
Mar 9 - 16 confirmed cases
Mar 9 (Approx.) - Metro ridership starts decreasing
Mar 16 - schools close
Mar 18? - PAUSE government order to shelter in place

Agent-Based Modelling

MTA Turnstile Data

MESA(Or our model)

Methodology

Results

Conclusion

References

[1] Mta station data. http://web.mta.info/developers/data/nyct/subway/Stations.csv.

[2] Mta turnstile data. http://web.mta.info/developers/turnstile.html.

[3] Albert-László Barabási and Márton Pósfai. *Network science*. Cambridge University Press, 2017.

[4] Philip Cooley, Shawn Brown, James Cajka, Bernadette Chasteen, Laxminarayana Ganapathi, John Grefenstette, Craig R. Hollingsworth, Bruce Y. Lee, Burton Levine, William D. Wheaton, and et al. The role of subway travel in an influenza epidemic: A new york city simulation. *Journal of Urban Health*, 88(5):982–995, Sep 2011.

[5] Jeffrey E. Harris. The subways seeded the massive coronavirus epidemic in new york city. http://web.mit.edu/jeffrey/harris/HarrisJE_WP2_COVID19_NYC_24-Apr-2020.pdf.

[6] M. Laskowski, B. C. P. Demianyk, J. Witt, S. N. Mukhi, M. R. Friesen, and R. D. Mcleod. Agent-based modeling of the spread of influenza-like illness in an emergency department: A simulation study. *IEEE Transactions on Information Technology in Biomedicine*, 15(6):877–889, 2011.

[7] Faïçal Ndaïrou, Iván Area, Juan J Nieto, and Delfim F M Torres. Mathematical modeling of covid-19 transmission dynamics with a case study of wuhan, Apr 2020.