

SYNOPSIS

02/03/2020

Review of “Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study”

Article citation: Wu JT, Leung K, Leung GM. Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study. Lancet. 2020 Jan 31 [Epub ahead of print]. Available from: <https://www.thelancet.com/lancet/article/nowcasting-and-forecasting>

One-Minute Summary

- This is a mathematical modeling study that used the number of confirmed cases identified outside of mainland China with symptom onset from December 25, 2019 to January 19, 2020, as well as mobility data from within China and from international flight traffic data, to estimate the **outbreak size in Wuhan** and the number of cases **exported** to other Chinese cities.
- In the baseline scenario, the authors estimated that:
 - the basic reproductive number (**R_0**) was **2.68** (95% confidence interval (CI): 2.47-2.86)
 - the **epidemic doubling time was 6.4 days** (95% CI: 5.8-7.1)
 - **75,815** (95% CI: 37,304 to 130,330) **individuals had been infected** in Greater Wuhan as of January 25, 2020
 - The number of cases exported from Wuhan to other Chinese cities as of January 26, 2020 was: **Chongqing 461** (227–805), **Beijing 113** (57–193), **Shanghai 98** (49–168), **Guangzhou 111** (56–191), **Shenzhen 80** (40–139)

Additional Information

- Without any reduction in transmissibility, the incidence in the Wuhan epidemic is estimated to peak in April 2020, and epidemics across cities in mainland China would lag by 1–2 weeks. If transmissibility was reduced by 25%, the magnitude of the epidemic would be **50% lower and the peak would be delayed by 1 month**.
- Based on the simulation, **quarantining of Wuhan** would have **little to no effect on total epidemic size** since multiple larger Chinese cities have already been seeded with cases.
- The authors note that “given the substantial volume of case importation from Wuhan, local epidemics are probably already growing exponentially in multiple major Chinese cities.” They raise

concerns of a global pandemic if no mitigation occurs, but suggest that it might still be possible to contain the spread such that imported cases or early local transmission does not lead to large outbreaks outside of Wuhan. The authors note that draconian measures may be required to contain the outbreak such as “cancellation of mass gatherings, school closures and instituting work-from-home arrangements.”

PHO Reviewer’s Comments

This is a modeling study and therefore the results are influenced by the inputs and assumptions used in the model.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Review of “Nowcasting and forecasting the potential domestic and international spread of the 2019-nCoV outbreak originating in Wuhan, China: a modelling study”. Toronto, ON: Queens’s Printer for Ontario; 2020.

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