

Using cell phone data to track population movements and more efficiently implement pandemic lockdowns

June 16 2022



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New research in the INFORMS journal *Management Science* identifies a new method of implementing pandemic lockdowns that decreases infection rates while also limiting negative economic impacts.

Spatial targeting recently employed in New York City tracks population movements and areas in need of lockdowns to reduce the spread of COVID-19. Using cell phone [data](#), the research finds that NYC's targeted closures can be further refined. Data also suggest that doing so is a big improvement over uniform (non-targeted) closure policies. This helps reduce the spread of the virus while limiting [economic impacts](#) because smaller areas are placed on lockdown one at a time, rather than an entire city.

"The existing approaches ignored individual mobility and focused only on disease prevalence in a neighborhood. Doing so leads to potentially ineffective solutions where individuals who live in high disease prevalence neighborhoods could spread the disease to other locations, e.g., when traveling for work or leisure. We can fix this issue by using mobility data," says John Birge of the University of Chicago.

The study, "Controlling Epidemic Spread: Reducing Economic Losses with Targeted Closures," was conducted by Birge alongside Ozan Candogan of the University of Chicago and Yiding Feng of Microsoft Corporation.

"Our results show that appropriate targeting achieves a reduction in infections with up to 23–42% lower economic cost, and by enabling 4–6 times more economic activity than uniform citywide closure policies," continues Birge, a professor in the Booth School of Business.

These results suggest that population movements within a region make the optimal targeted policies quite different from policies built on local infection measures, and that practices in adjoining regions may have a significant effect on the efficacy and design of epidemic control policies.

"Spatially-targeted restrictions could be extremely valuable in curbing

epidemic spread and simultaneously ensure that induced [economic losses](#) are limited," concludes Birge.

More information: John R. Birge et al, Controlling Epidemic Spread: Reducing Economic Losses with Targeted Closures, *Management Science* (2022). [DOI: 10.1287/mnsc.2022.4318](https://doi.org/10.1287/mnsc.2022.4318)

Provided by Institute for Operations Research and the Management Sciences

Citation: Using cell phone data to track population movements and more efficiently implement pandemic lockdowns (2022, June 16) retrieved 30 January 2023 from <https://phys.org/news/2022-06-cell-track-population-movements-efficiently.html>

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