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## Smartphone Location Data Can Leave Out Those Most Hit by Covid-19

Younger, white populations may be overrepresented in the data, researchers say

By Suman Bhattacharyya

Mobility data from smartphones has helped government and healthcare officials across the country make decisions in battling the Covid-19 pandemic, like whether to reduce capacity at public places or where to place testing and vaccination centers.

But the data may be flawed in many cases. A new study from researchers at Stanford University and Carnegie Mellon University suggests that smartphone location data often leaves out some people who could be most at risk from Covid-19: those who are over 65 years of age and those who are nonwhite.

“Big data is not always representative data,” says Daniel Ho, a law professor at Stanford and one of the authors of the study.

The researchers suggest that older people and people of color may be less likely to carry smartphones or use apps that show their location. They compared smartphone mobility data for election day in 2018 from geolocation firm SafeGraph Inc., which includes no information on personal identities, with voter data for that day from North Carolina, which includes information about voters’ race and age. The comparison showed that



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polling locations where more elderly and nonwhite people voted were significantly more likely to be underrepresented in the mobility data than locations where more younger and predominantly white people voted.

That discrepancy “has pretty significant implications in the ways in which this data and artificial-intelligence systems trained on top of it are used to inform pandemic response,” says Dr. Ho. “You may, for instance, miss certain nursing homes, to the extent that our study shows that older populations are far less

likely to be represented in this data.”

SafeGraph’s data is used by more than 1,000 organizations—including government organizations like the Centers for Disease Control and Prevention, academics and nonprofits—in efforts to monitor foot traffic as part of Covid-19 research efforts. The Wall Street Journal has previously licensed data from SafeGraph for use in its reporting. A SafeGraph spokesperson says the company provides tools to help researchers make adjustments for bias, as well as a platform for

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people to exchange observations with each other and with SafeGraph on “these and other potential research challenges.”

Eli Fenichel, a professor of natural-resource economics at Yale University, says it’s important to acknowledge the limitations of smartphone mobility data. “From the reports that the data providers have given us in our use of the data in research at the national level, there don’t appear to be huge red flags,” he says. However, when looking at

regional-level data, variations could occur, he says, depending on factors that could include which apps are contributing to the data, among others.

“With any data set, wherever we’re trying to get information about human behavior and what people are doing, we find issues particularly the finer you drill down,” he says.

Dr. Ho notes that mobility data is just one of several tools used by public health authorities, including testing, hospi-

talization and fatality rates and contact tracing. And while smartphone mobility information isn’t perfect, the solution isn’t to ignore the data, but to make adjustments for bias where warranted, he says. “Our study points toward ways in which we can understand the sources of bias, and as a result, think about adjusting inferences to account for these blind spots.”

*Mr. Bhattacharyya is a writer in Philadelphia.*