UW-Madison: COVID-19 model quantifies impact of region-specific social distancing orders

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MADISON – As the COVID-19 pandemic took hold in regions across the United States in the spring, governors, mayors and local leaders hoping to quell the spread of the virus turned to the only actionable defenses available at the time: They closed schools and businesses, banned mass gatherings, issued stay-at-home orders and enforced other social distancing measures.

Now, a study published in the Annals of Internal Medicine by University of Wisconsin-Madison researchers quantifies the region-specific impact of social distancing measures on the COVID-19 caseload in three distinct areas: New York City, the Milwaukee metropolitan area and Dane County in Wisconsin.

Using aggregated data on the movement of cellphones, researchers from UW-Madison's College of Engineering and School of Medicine and Public Health created a computational model to simulate COVID-19 cases based on when social distancing directives were implemented and eased, as well as how diligently people adhered to those orders.

The simulation shows social distancing measures wielded major influence on case numbers, though the impact varied markedly in different areas, even within the same state.

According to their model, the timing of implementing of social distancing measures was particularly crucial in New York, where the state restricted mass gatherings March 12 and introduced increasingly stringent measures over the following 10 days.

However, according to the researchers' modeling, had the state acted one week earlier, the number of cases in New York City would have been 80 percent smaller (41,366 instead of 203,261) by the end of May; conversely, a week's delay would have increased the caseload nearly seven times, to more than 1.4 million.

The impact of the timing wasn't as dramatic in Dane County, where a one-week delay would have increased its number of cases 36 percent by the end of July.

"Everybody knows, qualitatively, social distancing measures have made a difference, but I think this is one of the most accurate estimates of how much of a change they really led to," says Oguzhan Alagoz, professor of industrial and systems engineering and first author on the paper. "In places where you have high population density and a lot of movement in and out of the area, the impact of social distancing is significantly greater, compared to other places. Wisconsin, for example, implemented the same social distancing measures statewide, but the impact was different in Dane County, Milwaukee and other areas. Our model actually is able to tell us this quantitative estimate of how much of a difference we are going to see from one region to another."

STORY CONTINUES AT https://news.wisc.edu/covid-19-model-quantifies-impact-of-region-specific-social-distancing-orders/