Structural racism drives higher COVID-19 death rates in Louisiana, study finds

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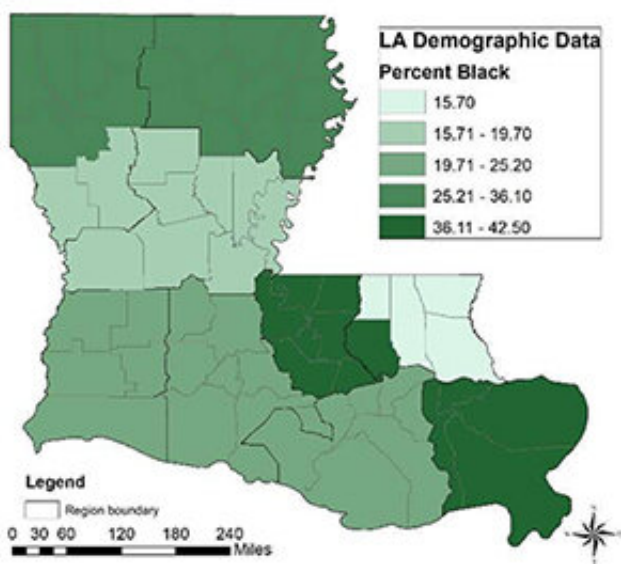

The spatial distribution of percent Black residents in Louisiana. Credit: Guangxiao Hu, Nora Hamovit, Kristen Croft, Jennifer D. Roberts, and Deb Niemeier, University of Maryland.

Disproportionately high COVID-19 mortality rates among Black populations in Louisiana parishes are the result of longstanding health vulnerabilities associated with institutional and societal discrimination, according to research conducted by an interdisciplinary team under the mentorship of University of Maryland (UMD) Clark Distinguished Chair Deb Niemeier and UMD Associate Professor of Kinesiology Jennifer Roberts in the School of Public Health.

The team included doctoral students from three different programs at UMD, working together as part of an interdisciplinary fellowship program known as UMD Global STEWARDS, directed by Professor Amy R. Sapkota of the School of Public Health.

"Our results suggest that structural racism and inequities led to severe disparities in initial COVID-19 effects among highly populated Black Louisiana communities, and that as the virus moved into less densely populated Black communities, similar trends emerged," the researchers concluded in a study published in the *Proceedings of the National Academy of Sciences* on Monday, June 27.

Over the course of generations, discrimination in employment, education, housing, and access to medical care has led to higher risks of chronic illnesss (including asthma, diabetes, and obesity) among Black communities, as well as a higher likelihood of suffering a stroke, the authors noted. The Centers for Disease Control and Prevention (CDC) have linked these factors to the likelihood of becoming severely ill from COVID-19.

Both nationally and in Louisiana, Black communities encounter inadequate housing and lower rates of home ownership, reduced access to health care, and lower rates of employment. As exemplified by Cancer Alley, Black families are more likely to live in so-called "fence-line" neighborhoods, located near industrial facilities that expose them to pollutants, and typically encounter reduced air and water quality compared to white Americans. Black families are also more likely to be uninsured and face higher rates of unemployment. These and multiple other factors, all reflecting decades of institutional and societal bias, add up to a combination of stressors that undermine health and, in the case of COVID-19, have made Black communities particularly vulnerable.

To obtain their findings, the team members identified the spatial distribution of social and environmental stressors across Louisiana parishes, and used hotspot analyses to develop aggregate stressors. They then tracked the correlations among stressors, cumulative health risks, COVID-19 mortality rates, and the size of Black populations across Louisiana. The results suggest

that COVID-19 mortality rates initially spiked in Black communities with high population densities and moderate levels of aggregate stress. Over time, the rates also increased in less densely populated Black communities with higher levels of aggregate stress.

"We find that Black communities in Louisiana parishes with both higher and lower population densities experience higher levels of stressors leading to greater COVID-19 mortality rates," the researchers wrote. "Our work using the COVID-19 pandemic, particularly as observed in Louisiana, makes clear that communities with high levels of social, economic, and environmental racism are significantly more vulnerable to a public health crisis."

The study lead authors include UMD graduate students Kristen Croft (Department of Civil and Environmental Engineering). Nora Hamovit (Department of Biology), and Guangxiao Hu (Department of Geographical Sciences).

Allen P. Davis, Professor of Civil and Environmental Engineering, is a co-PI for the UMD STEWARDS program, which aims to bring together graduate students from a wide variety of backgrounds to work on collaborative projects. "Each student brings their own area of expertise to the table, resulting in synergy," Davis said. "That kind of synergy is something you might not get in other disciplinary studies."

The value of such an approach was evident in the collaboration among the three students. "As a human geographer, my main focus was on the spatial disparities of structural racism and inequities and their effects on COVID-19 mortalities," Hu said. "Using hotspot analysis, we identified two groups of parishes with high or low population densities located at different regions of Louisiana. Our research provides policy makers with very useful insights about the disproportionate burden of Black communities and the nonstationary distribution of this disproportion across Louisiana."

Hamovit performed the initial data analysis that yielded stressor index calculations, which Hu then utilized for hotspot analysis. "Because my Ph.D. research involves large and complex data sets I brought a strength of data organization and analysis to our team," Hamovit said. Croft played a key role in defining the research topic and utilized her background in stormwater research to pinpoint specific variables that could have a bearing on health.

Faculty mentors included Niemeier and Roberts. Niemeier, who joined the UMD civil and environmental engineering faculty in 2020 as the inaugural Clark Distinguished Chair, is an internationally-recognized expert on the equity impacts of infrastructure and engineering decisions. She is a member of the National Academy of Engineering and, in 2021, was elected to the American Philosophical Society. Her work, which details how marginalized communities are affected by vehicle emissions, development patterns, climate change, and approaches to disaster preparation and recovery, has helped spur policy and regulatory reforms.

More information: Assessing inequities underlying racial disparities of COVID-19 mortality in Louisiana parishes, *Proceedings of the National Academy of Sciences* (2022). doi.org/10.1073/pnas.2123533119

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