RESIDENTIAL RACIAL SEGREGATION AND SOCIAL DISTANCING IN THE UNITED STATES DURING COVID-19

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OBJECTIVE OF STUDY

• To examine whether residential racial segregation may be constraining capacities for social distancing thus leaving African Americans potentially more exposed to contracting COVID-19.
• The spatial separation of racial groups through residential segregation has been a central component of racism in the United States.

• Segregation has been shown to have a disproportionately negative impact on the health of Black Americans, affecting life expectancy as well as the prevalence of certain infectious and chronic diseases. (Hill, Nielsen, and Fox 2013; Phelan and Link 2015; Williams and Collins 2001; Williams and Sternthal 2010)

• Research on health disparities in the 2009 H1N1 epidemic find that a variety of factors led to a higher prevalence of H1N1 cases in non-white populations
  • including the decreased capacity to effectively social distance as a result of structural inequalities rooted in ongoing racial injustice.(Lowcock et al. 2012:1; Quinn et al. 2011)
DATA

- County-level data from March 8th to August 7th, 2020.
- Multiple sources from:
  - Hopkins CSSE COVID-19 tracking system
  - Census Bureau
  - Centers for Disease Control and Prevention (CDC)
  - Bureau of Labor Statistics
## Sample Selection

<table>
<thead>
<tr>
<th></th>
<th>Analytic Sample</th>
<th>Hotspot Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong># Counties</strong></td>
<td>1,972</td>
<td>135</td>
</tr>
<tr>
<td><strong># County-day obs.</strong></td>
<td>283,097</td>
<td>19,256</td>
</tr>
<tr>
<td><strong>Selection criteria</strong></td>
<td>Valid data on mobility</td>
<td>Top 100 counties with</td>
</tr>
<tr>
<td></td>
<td>and Black/White D-Index</td>
<td>county-level cumulative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>confirmed cases per</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100,000 residents in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>either period: Jan 22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- April 12, April 13 -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jul 24.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valid data on mobility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and Black/White D-Index</td>
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</tbody>
</table>
Dependent Variable

Mobility Ratio (MR):

Median daily travel distance ("m50") normalized by the baseline value

- The median value of $M_{\text{max}}$ (in kilometers)
- Collected by Descarts Labs using mobile device locations
- Only available from March 1\textsuperscript{st} and onward
- Baseline value: average "m50" between March 1\textsuperscript{st} and March 7\textsuperscript{th}
INDEPENDENT VARIABLES

• Main Interests:
  • Black/White D-index
  • Two state policy timings of “stay-at-home” and “reopen”

• Other Covariates:
  • Geographic: metropolitan and 4 regions
  • Demographic: racial composition and population density
  • Socioeconomic status: 1-month lagged unemployment rate, SES vulnerability index

• GEE models with exchangeable error structure
A. Mobility Ratio Trend for 1972 Counties

RESULTS

B/W D-Index

- <0.20 (n=118)
- 0.20-0.30 (n=223)
- 0.30-0.40 (n=335)
- 0.40-0.50 (n=465)
- 0.50-0.60 (n=445)
- >=0.70 (n=143)
stay-at-home reopen
0.0 0.5 1.0 1.5 2.0
Mar 8 Mar 28 April 17 May 7 May 24 June 13 July 3 July 23

Mobility Ratio
Wayne, WI (0.79)
## GEE Models on Mobility Ratio

<table>
<thead>
<tr>
<th></th>
<th>Analytic sample additive</th>
<th>Analytic sample interactive</th>
<th>Hotspot sample additive</th>
<th>Hotspot sample interactive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Racial segregation</strong></td>
<td></td>
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</tr>
<tr>
<td>Black-White D</td>
<td>-0.104**</td>
<td>-0.141***</td>
<td>-0.220*</td>
<td>0.110</td>
</tr>
<tr>
<td><strong>State policy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stay-at-home</td>
<td>-0.185***</td>
<td>-0.082***</td>
<td>-0.226***</td>
<td>-0.040</td>
</tr>
<tr>
<td>Reopen</td>
<td>-0.048***</td>
<td>-0.114***</td>
<td>-0.048**</td>
<td>0.098***</td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
<td></td>
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<tr>
<td>D*stay-at-home</td>
<td></td>
<td>-0.213***</td>
<td></td>
<td>-0.425***</td>
</tr>
<tr>
<td>D*reopen</td>
<td></td>
<td>0.154***</td>
<td></td>
<td>-0.359***</td>
</tr>
<tr>
<td><strong>No. county-days</strong></td>
<td>296,901</td>
<td>296,901</td>
<td>20,201</td>
<td>20,201</td>
</tr>
<tr>
<td><strong>No. counties</strong></td>
<td>1,972</td>
<td>1,972</td>
<td>135</td>
<td>135</td>
</tr>
</tbody>
</table>

All models have adjusted for time function, geographic, demographic and SES covariates.

Marginal effect under two policy timings:
Analytic sample: (-0.141-0.213) vs. (-0.141+0.154), p=0.0001
Hotspot: (0.110-0.425) vs. (0.110-0.359), p=0.023
DISCUSSION

• Our analysis highlights how racial segregation may influence social distancing during COVID-19.

• Like other studies that have demonstrated the disparate effects of racism on COVID-19 cases and mortality (Coughlin et al. 2020; Garg 2020; Millett et al. 2020) this study suggests that racist structures such as residential segregation may play a role in the capacity of Americans to successfully carry out the physical distancing required to limit the spread of COVID-19 without interventions.
CONCLUSION

• This analysis reflects a demonstrated need to consider the legacies and complex influence of racism on COVID-19 in the United States.

• Future interventions, such as the re-introduction of lockdown orders and their relaxation, or the provision of financial support for those under such policies should respond to the disparate effects of policy on different communities around the country.

• Moreover, persistent racial inequalities, especially in housing and residential segregation suggest that one-size-fits-all interventions such as lockdowns and stay-at-home orders and their relaxation may exhibit varying effects based upon the intensities of structural racism.