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1 Correlation Between New York City Hot Spotting Policy and Mobility to Reduce COVID-19 Spread



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Study Objective: In October 2020, New York State initiated a micro-cluster strategy (“hot spotting”) that divides into three categories based on COVID-19 cases and hospital capacity, each with successively more restrictions: Yellow, Orange, and Red Zones. Our objectives were to evaluate the influence of hot spotting on mobility and subsequent mortality, and then to identify underlying social determinants of health associated with the neighborhoods most affected by hot spotting.

Study Design: We combine several data sources in our analysis. Time-dependent data were obtained from SafeGraph for cellphone mobility at the Census Block Group, New York State Governor’s Office for hot spotting, school and indoor dining, and NYC Department of Health and Mental Hygiene (DOHMH) for COVID-19 cases and mortality. Using the DOHMH’s “Modified Zip Code Tabulation Areas” (MODZCTA), we matched these to community-level data obtained from 2018 American Community Survey 5-year estimates for population density. Our main outcomes are Average Median Percentage Time Home (AMPTH) and Device-Weighted Average Median Percentage Time Home (DWAMPTH) from SafeGraph Social Distancing Metrics summarized to MODZCTA boundaries. Home is defined as the common nighttime location of each mobile device over a 6-week period to a Geohash-7 granularity (~153m x ~153m). We implemented the Wilcoxon rank-sum test with a <0.05 p-value threshold for each day since hot spotting policy to compare MODZCTA with any of the Zone’s designation to those without designation. Our main outcomes are Average Median Percentage Time Home (AMPTH) and Device-Weighted Average Median Percentage Time Home (DWAMPTH) from SafeGraph Social Distancing Metrics summarized to MODZCTA boundaries.

Population Studied: NYC residents from October 5, 2020, to December 31, 2020 (87 days total) using the 177 MODZCTA within NYC as geographic unit of analysis.

Results: For the AMPTH measurement, MODZCTAs with hot spotting Zone’s designation had 84 days (95% of the days) with statistically significantly lower mobility than non-intervention MODZCTAs, and for the DWAMPTH measurement, 83 days (97% of the days) had statistically significantly lower mobility. 58 of the days had p-value<0.001 for AMPTH and 49 had p-value<0.001 for DWAMPTH, and only a minority of days had p-value>0.1 (2 days for AMPTH and 3 for DWAMPTH).

Looking at individual boroughs, Brooklyn had 42 statistically significant days for AMPTH and 49 for DWAMPTH, while Queens had 12 statistically significant days for AMPTH and 7 for DWAMPTH.

Conclusions: New York State’s micro-cluster focus Zones is associated with decreased mobility in high COVID-19 prevalence areas. Our study suggests that shutdowns targeted at small geographic areas may reduce mobility and thus can potentially help control COVID-19 spread.

2 Racial Disparities in Patients Hospitalized for COVID-19: An Observational Cohort Study



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Study Objectives: To study the impact of COVID-19 hospitalizations on patients from differing ethnic and racial groups.

Study Design and Methods: This is an IRB-exempt observational cohort study of de-identified patient data obtained from our central billing system comprising greater than 8.6 million emergency visits annually in over 175 United States hospitals. Inclusion criteria were adults aged 18 years and older, a presentation to one of our hospital emergency departments, and an admission for COVID-19 infection. Outcome variables were length of stay, in-hospital mortality, disease severity, and discharge disposition. Discharge disposition was further categorized into home, skilled nursing facility, hospice. Outcomes were stratified by racial groups: White, Black, Hispanic and Other. Statistical analysis consisted of summary statistics (distributions) with medians and interquartile ranges reported for non-normally distributed variables. Linear regression analyses determined factors predictive of outcome. A p-value of <0.05 was considered statistically significant. All statistical analyses were performed using JMP Pro 14.1 for Windows (R).