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Prevalence of COVID-19 in Louisiana and Its Association with Race, Concentrated Disadvantage, Chronic Disease Prevalence and other Social Determinants of Health

The novel Coronavirus (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2), was first identified in Wuhan, China and has globally infected over 11 million people. Those most vulnerable to the devastating effects of COVID-19 are the socioeconomically disadvantaged, elderly, homeless, and racial/ethnic minorities. In the United States, Black people are the largest demographic being disproportionately affected by COVID-19. This is also evident in the racial breakdown of COVID-19 cases and mortality in Louisiana, whereby Blacks represent a third of the state population, but account for over half of those infected and deaths. In addition, individuals with a history of underlying health conditions and chronic illnesses such as coronary heart disease (CHD), hypertension (HTN) and diabetes are associated with a greater risk of suffering severe complications if infected with COVID-19.The objective of this study was to evaluate and compare the association between social determinants of health and concentrated disadvantage, incorporating race and rates of CHD, HTN, and diabetes with the prevalence and mortality of COVID-19 in Louisiana and Orleans Parish.

The sample population was from the 1,148 census tracts in the state of Louisiana, composed of 4.6 million residents. Data sources included the 2018 American Community Survey, the United States Census Bureau, the Center for Disease Control and Prevention and Louisiana COVID-19 infection and mortality cases were from the Louisiana Department of Health. Negative binomial regression was performed to evaluate the association between prevalence of COVID-19 and concentrated disadvantage, rates of chronic disease, and other housing and socioeconomic variables. The models for concentrated disadvantage index (CDI) were further adjusted for HTN, CHD, and diabetes. As of June 29, 2020, there has been 57,081 prevalent COVID-19 cases within the included 1,105 Louisiana census tracts and 7,796 in 133 tracks in Orleans Parish. In Louisiana, the mean prevalence of COVID-19 was 11.21 (STD ±8.65) per 1,000 cases and in Orleans parish the mean prevalence was 17.06 (STD ± 7.43) per 1,000 cases. Being a renter in Orleans Parish had a negative correlation with prevalence of COVID-19 (r=-0.47). In Orleans parish, there was an 11% increased risk of COVID-19 associated with CDI at the census track level; percent Black, percent female headed-households, and percent below poverty had the highest association at the census track level. Considering all of the Louisiana census tracts, CDI had a relatively high prediction of COVID-19 with a risk ratio of 1.09 (CI 95% 1.08,1.10). When considering the prevalence of HTN, CHD, and Diabetes, the association of CDI with increased risk of COVID-19 was reduced.

Our preliminary ecological analysis of concentrated disadvantage in Louisiana and Orleans parish demonstrate an increased risk of prevalence in census tracts with higher proportions of Black residents. We also found that the association of HTN and COVID-19 prevalence was independent of CDI. We are continuing to complete further analysis of additional measures of social determinants of health including insurance status, housing and service industry employment.