

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

Haley Williams; Denise Danos, PhD; Elizabeth Levitzky, PhD;
Tekeda Ferguson, PhD
Louisiana State University Health-New Orleans, School of Public Health

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Background

- 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.
- Chronic health conditions, such as coronary heart disease (CHD), hypertension (HTN) and diabetes have been linked to increased rates of morbidity and mortality among COVID-19 cases.
- In Louisiana, the highest rates of mortality due to COVID-19 is among the Black race/ethnic group.

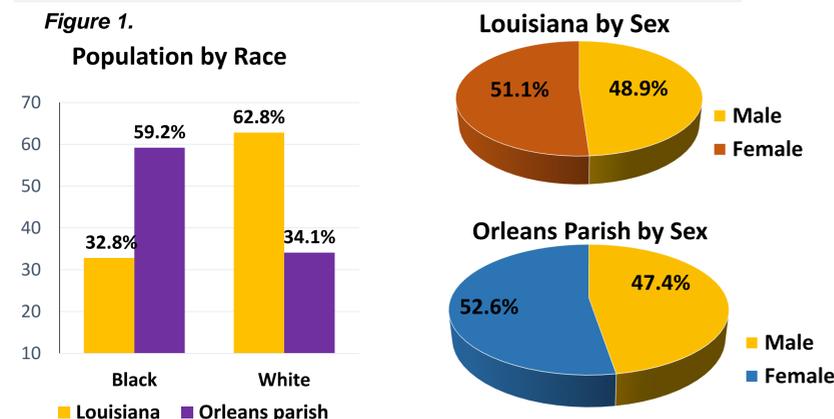
Objective

- To evaluate and compare the associations between social determinants of health (SDoH) and concentrated disadvantage, incorporating race and prevalence of CHD, HTN, and diabetes with the prevalence and mortality of COVID-19 in Louisiana and Orleans Parish

Methods

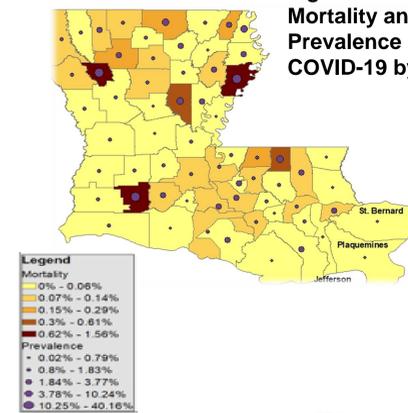
- An ecological analysis of the total cases of COVID-19 up to June 29, 2020 across 1,148 census tracts in the state of Louisiana was conducted
- Data sources included the US Census Bureau, the Center for Disease Control and Prevention and the Louisiana Department of Health
 - Concentrated Disadvantage Index (CDI) was calculated at the census tract level in accordance with the Phen X Toolkit protocol, using American Community Survey 2018 estimates
 - Additional social and economic domains including housing, insurance, and education were explored in association with the prevalence of COVID-19.
- Spearman rank correlations were calculated for prevalence of COVID-19 and SDoH measures.
- Negative binomial regression was used to evaluate the association between prevalence of COVID-19 and concentrated disadvantage, rates of chronic disease, and other housing and socioeconomic variables.
- Multi-level analysis was used to explore mortality, fatality, and prevalence risk-ratios to show Black-White disparities by parish.

Figure 1.



- In Louisiana, the mean prevalence of COVID-19 across census tracts was 11.2 ± 8.7 per 1,000 cases and in Orleans parish the mean prevalence was 17.1 ± 7.4 per 1,000 cases.
- In Orleans Parish, HTN was the most prevalent across census tracts, 39.4% ± 9.73; with a smaller percent of residents having diabetes (13.7%) and CHD (6.4%) across census tracts.

Figure 2. Overall Mortality and Prevalence of COVID-19 by Parish



Results

	Louisiana	Orleans Parish
Total		
Population	4.6 million	391,006
COVID-19		
Prevalence (per 100,000)	1,425	2,079
White	666	977
Black	1,798	2,180
Mortality		
(per 100,000)	65	137
White	49	89
Black	100	172

Table 1. COVID-19 Racial Distribution of Cases and Deaths

Figure 3. COVID-19 among Black Population in Orleans Parish

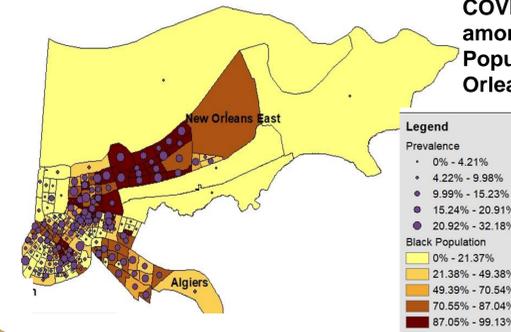


Figure 4. COVID-19 in Areas of Concentrated Disadvantage in Orleans Parish

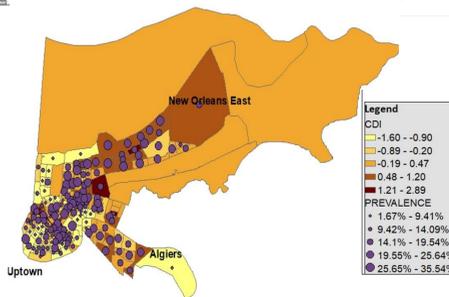


Figure 5. Correlations of CDI, Housing, and Socioeconomic Variables with Prevalence of COVID-19 in Louisiana & Orleans Parish

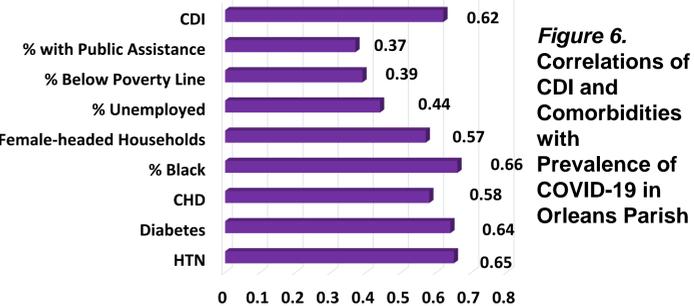
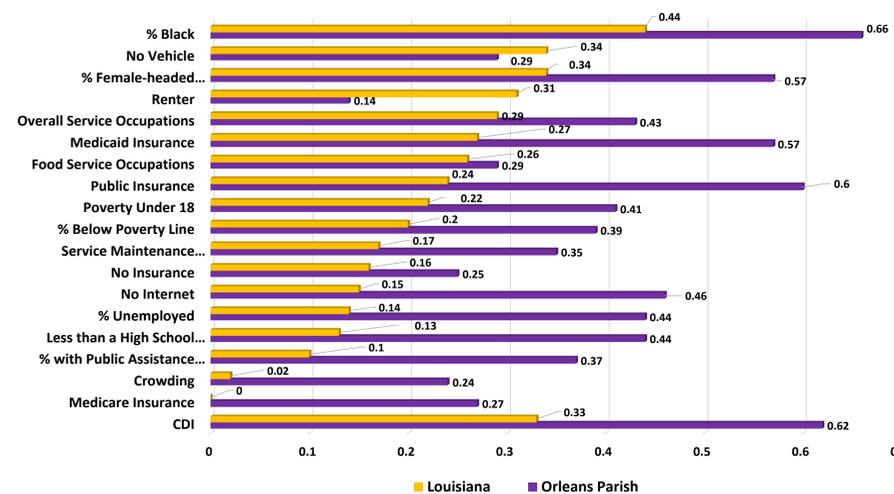
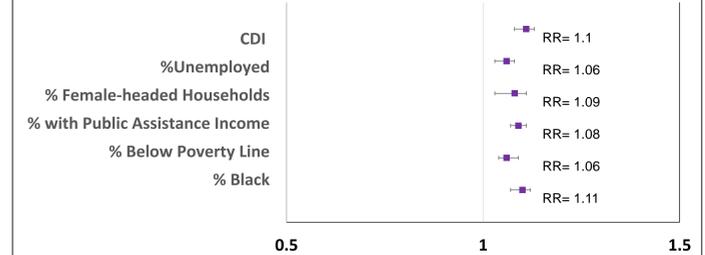


Figure 6. Correlations of CDI and Comorbidities with Prevalence of COVID-19 in Orleans Parish

Figure 7. COVID Risk Ratios



- In Orleans Parish, Black residents had a rate of COVID-19 infection almost three times that of White residents (RR=2.77; 95% CI 2.48 - 3.10), per 100,000 cases.
- Orleans Parish Black residents also had a mortality rate 1.64 (95% CI 1.28- 2.1) times that of White residents, per 100,000 cases.

Discussion

- Overall, areas of concentrated disadvantage in Orleans parish were associated with a higher prevalence of COVID-19.
- Other social variables such as working in the service industry, having less than a high school education or having public insurance were also strongly correlated with prevalence of disease.
- When considering the prevalence of HTN, CHD, and diabetes, the association of CDI with COVID-19 prevalence was reduced.
- Limitations of this study include the ecologic design which prevents the interpretation of causality and that mortality rates in Louisiana were not age adjusted and given the distribution of age by race we would expect mortality among Black residents to increase.

Conclusions

- These preliminary analysis support the hypothesis that the risk of COVID-19 is higher among Black populations and the socially vulnerable, including groups of lower social economic status.
- Further analyses are planned to continue to explore measures of SDoH and determine whether the results are consistent in areas of concentrated disadvantage and high social vulnerability across the country.