



Who Bears the Burden? Racial Disparities in Confirmed Cases of COVID-19 in the Greater Boston Area

Item Type	poster;event
Authors	Helling, Leija
Citation	Helling, Leija. 2020. "Who Bears the Burden? Racial Disparities in Confirmed Cases of COVID-19 in the Greater Boston Area." Poster presented at Massachusetts GIS Day, November 18. https://doi.org/10.7275/12nv-wt76
DOI	https://doi.org/10.7275/12nv-wt76
Download date	2026-03-07 11:35:27
Item License	http://creativecommons.org/licenses/by/4.0/
Link to Item	https://hdl.handle.net/20.500.14394/29921

Who Bears the Burden?

Racial Disparities in Confirmed Cases of COVID-19 in the Greater Boston Area

Abstract

Documenting racial disparities in the spread of COVID-19 is crucial to bettering public health. In the Boston area, non-white and Black communities are significantly overrepresented in areas of high confirmed COVID-19 prevalence. Areas where high prevalence is clustered (“hot spots”) have disproportionate shares of non-white and Black residents, and the disparities are statistically significant. These results confirm marked COVID-19 racial disparities in Boston.

Introduction

The spread of COVID-19 has highlighted racial health disparities in the U.S. and their costs. Data from across the U.S. indicate that the disease disproportionately affects racial and ethnic minority groups¹. According to a CDC report, Black communities are experiencing a particularly disproportionate burden of COVID-19 incidence¹.

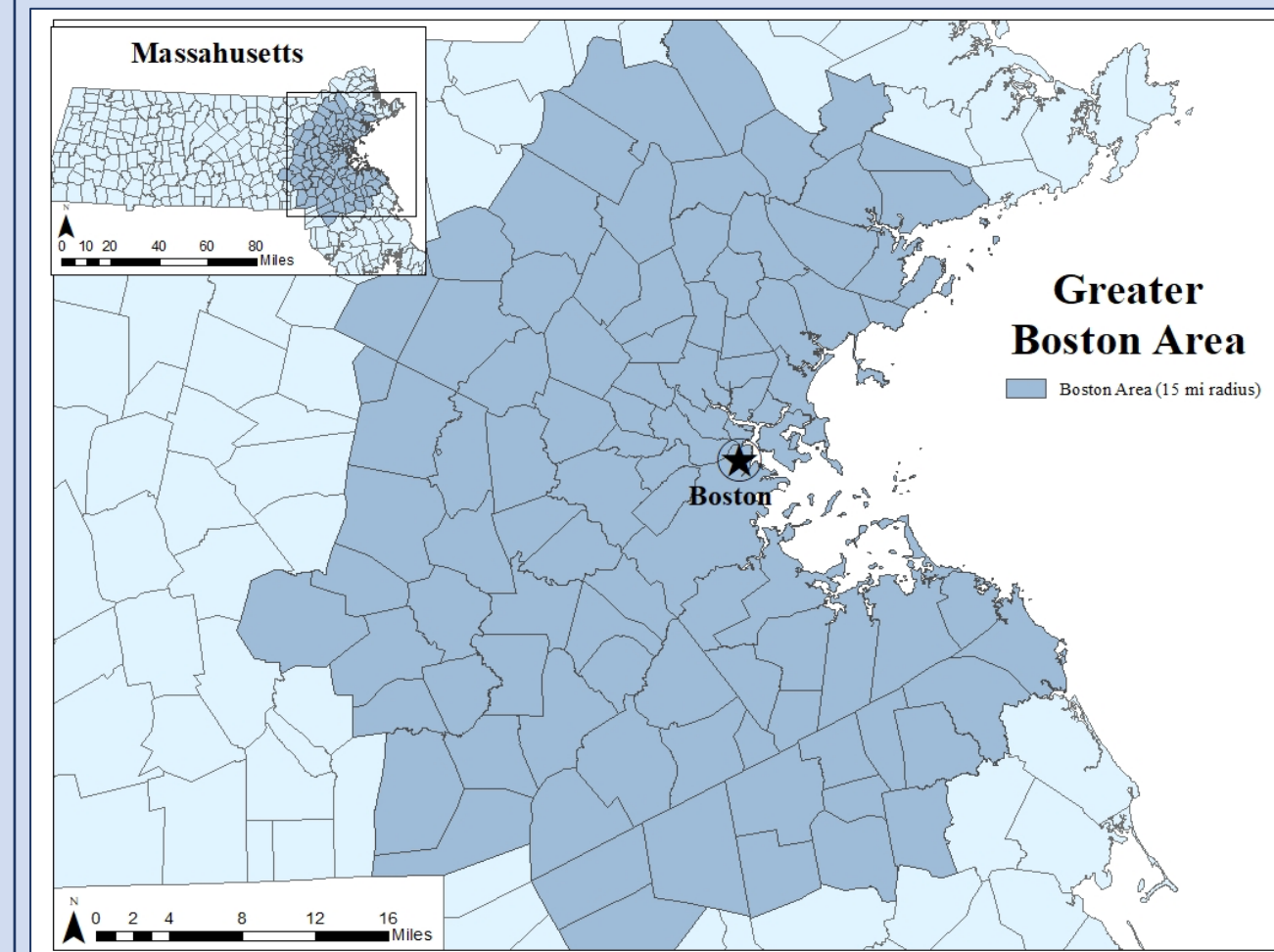


Figure 1: Greater Boston Area

The Boston area (Figure 1) was a national coronavirus hotspot during the spring of 2020, with one of the highest rates of virus-related deaths in the U.S.². Reports from the Mass. Dep. of Public Health confirm the stark racial divide in Massachusetts surrounding COVID-19 illness and death. Documenting the extent and significance of these disparities is a critical first step to addressing systemic racial health disparities in the Boston area.

1. “COVID-19 in Racial and Ethnic Minority Groups.” *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 4 June 2020, www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/racial-ethnic-minorities.html. 2. Oakes, Bob. “Mass. Is One Of The Country’s Coronavirus Hotspots.” *Mass. Is One Of The Country’s Coronavirus Hotspots* | *CommonHealth*, WBUR, 20 Apr. 2020, www.wbur.org/commonhealth/2020/04/20/covid-19-coronavirus-massachusetts-boston-update.

Methods

Spread of COVID-19 in towns within 15 miles of Boston

- Found number of confirmed COVID-19 cases per 1000 residents (Figure 2)
- Located statistically significant “hot spots” where high values are clustered (Figure 3)

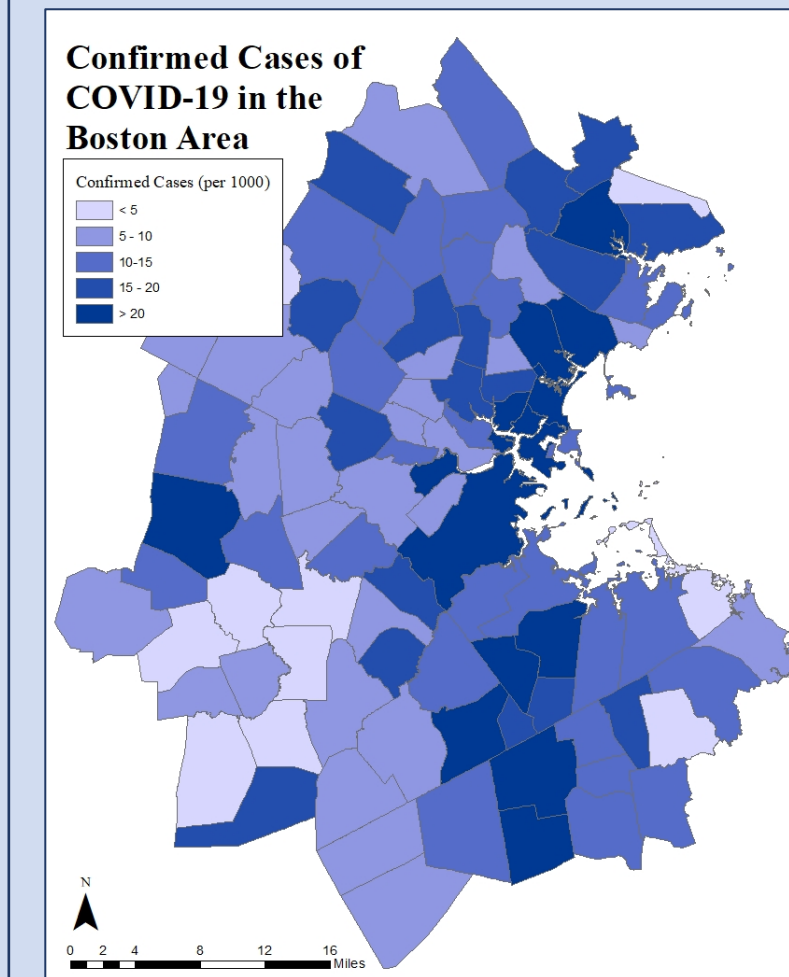


Figure 2: COVID-19 Confirmed Cases

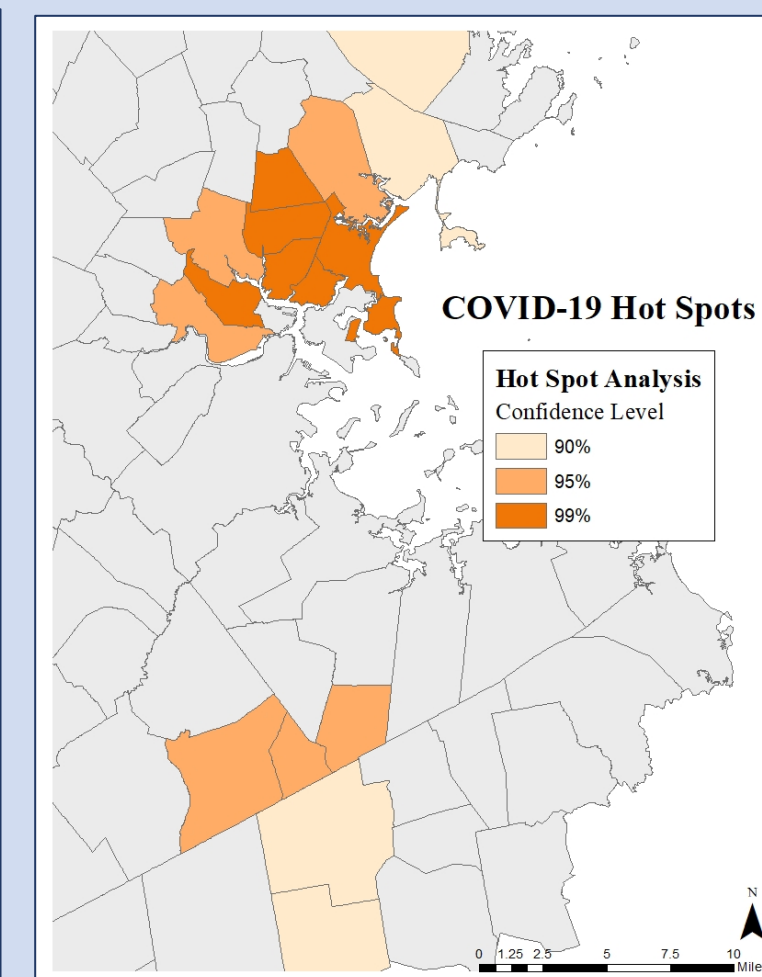


Figure 3: COVID-1 Hot Spots

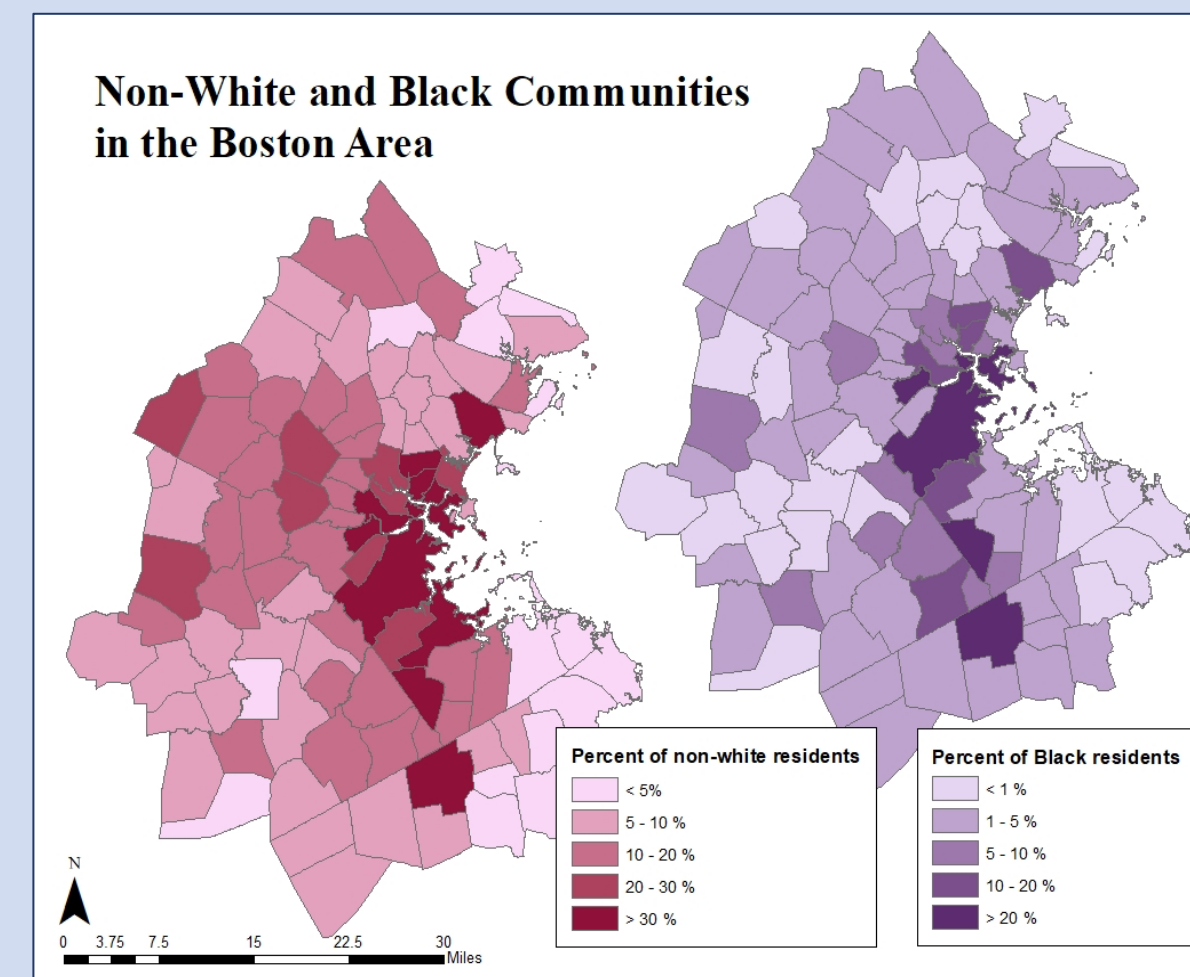


Figure 4: Non-White and Black Communities

Non-white and Black communities in towns within 15 miles of Boston

- Found percentage of non-white residents and percentage of Black residents by town (Figure 4)

Analysis

- Created bivariate maps to depict correlation between COVID-19 prevalence and racial make-up (Figure 5, Figure 6)
- Compared racial make-up of hot spot areas to all towns using histograms (Tables 1 – 4)
- Performed t-Tests to probe for statistically significant differences in racial make-up of hot spot areas compared to all Boston area towns

Results

This study shows that COVID-19 has affected Boston area cities and towns with greater percentages of non-white and black residents at disproportionately higher rates. As shown in Figure 5, 18 towns with a high prevalence of confirmed COVID-19 cases also have a high percentage of non-white residents while 8 have a medium percentage and 7 have a low percentage. Figure 6 shows that 18 towns with a high prevalence of confirmed COVID-19 cases also have a high percentage of black residents, whereas 11 have a medium percentage and 4 have a low percentage. The results also indicate that hot spots for COVID-19 are located in areas with disproportionate shares of non-white and Black residents as compared to the the Boston area as a whole. The frequency distributions shown in Tables 1 – 4 clearly show that towns with larger non-white and Black communities are overrepresented in the data set showing locations where high COVID-19 prevalence is clustered (“hot spots”).

Deeper statistical analysis reveals that there is a significant difference between the racial make-up of hot spot areas for COVID-19 and the racial make-up of all towns in the Boston area. A t-Test revealed that hot spot areas have a significantly greater percentage of non-white residents ($M = .24, SD = .026$) than the entire Boston area ($M = .14, SD = .014$), $t(20) = -2.54, p = .019$. There is also a significant difference in the percentage of Black residents in hot spot areas ($M = 0.86, SD = .0054$) as compared to the entire Boston area ($M = .039, SD = .0036$), $t(21) = -2.53, p = .019$. These findings make clear that significant racial disparities surrounding COVID-19 exist in Boston-area communities.

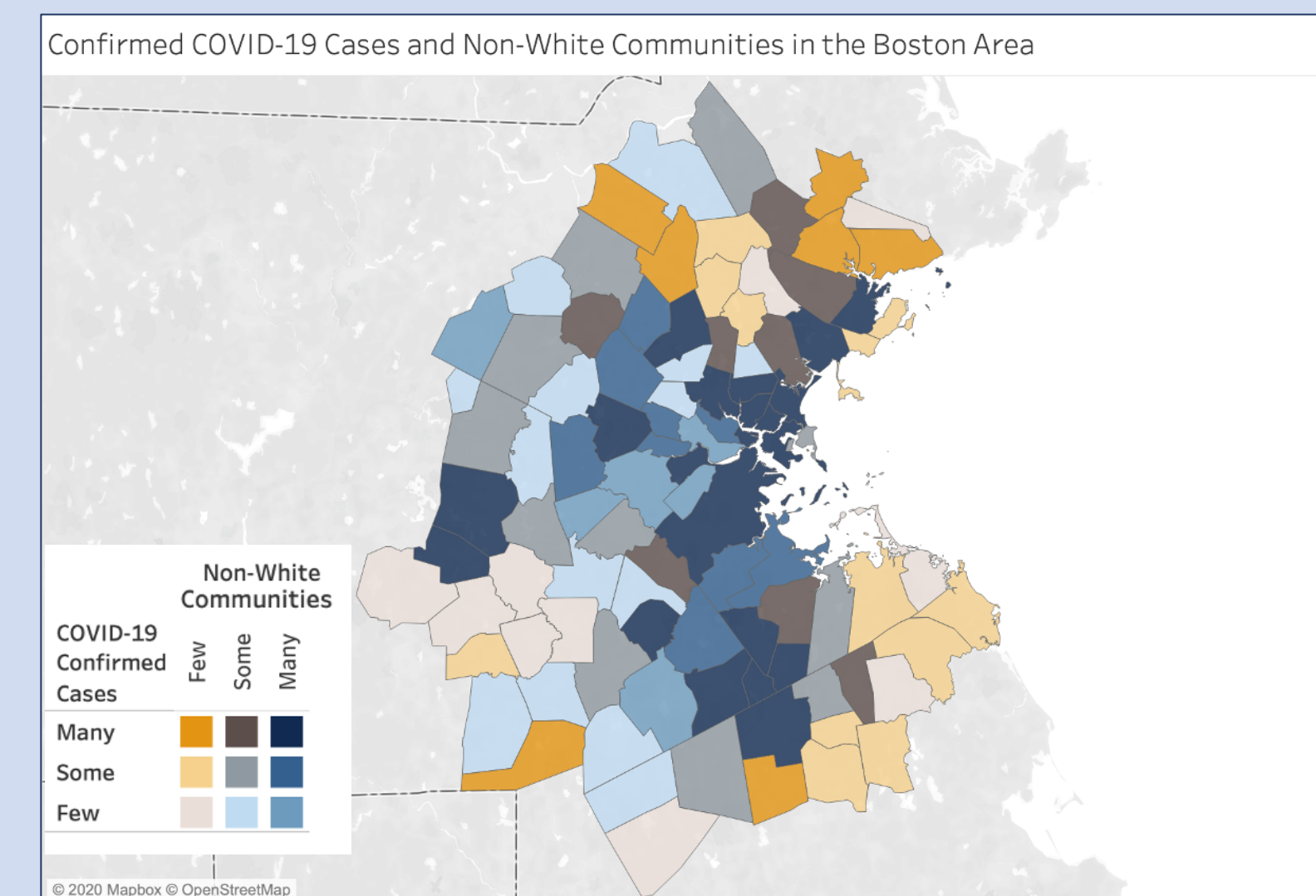


Figure 5: COVID-19 Confirmed Cases and Non-White Communities

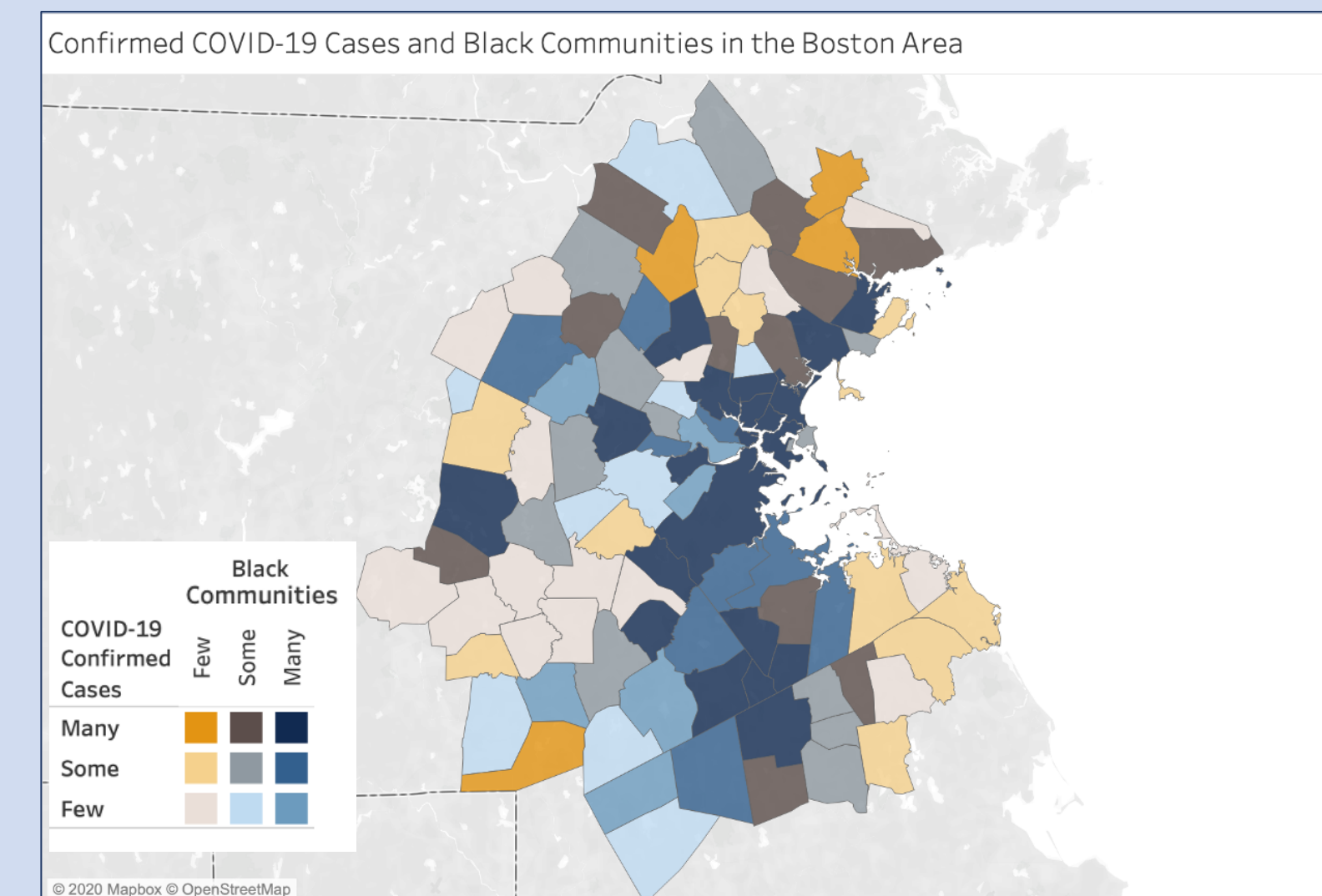
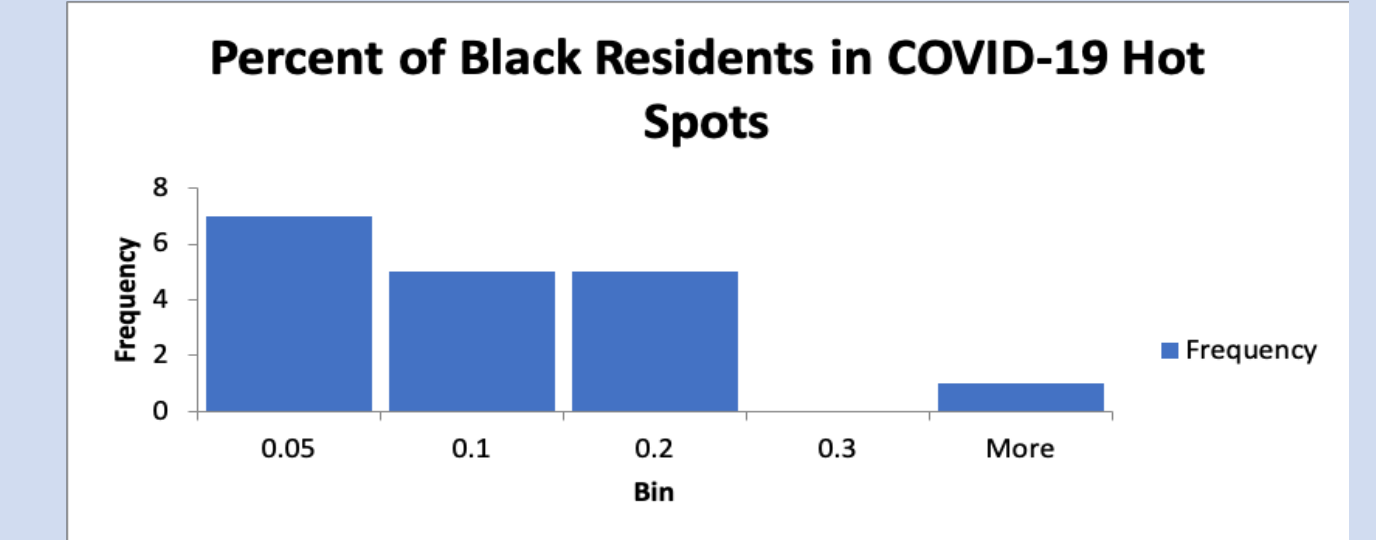
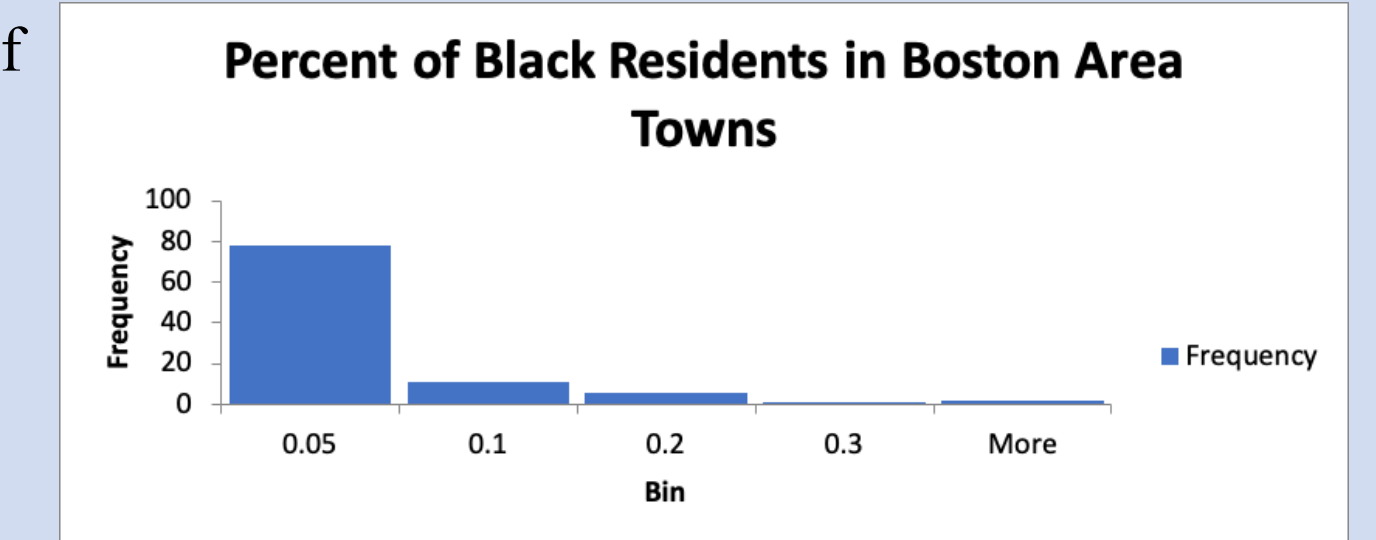
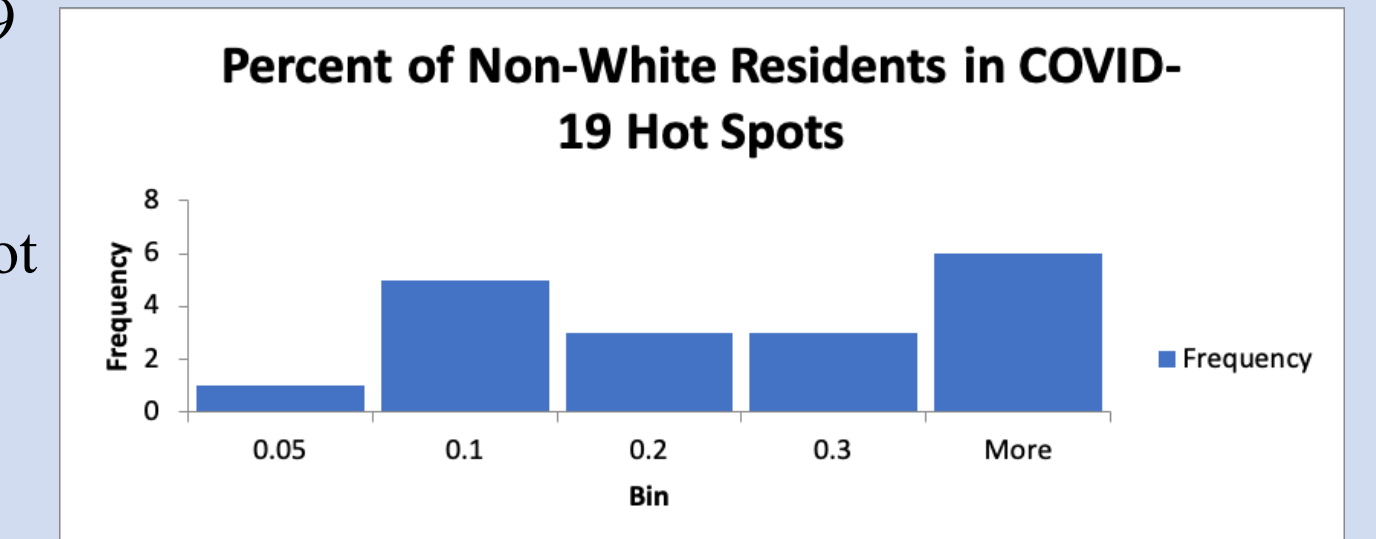
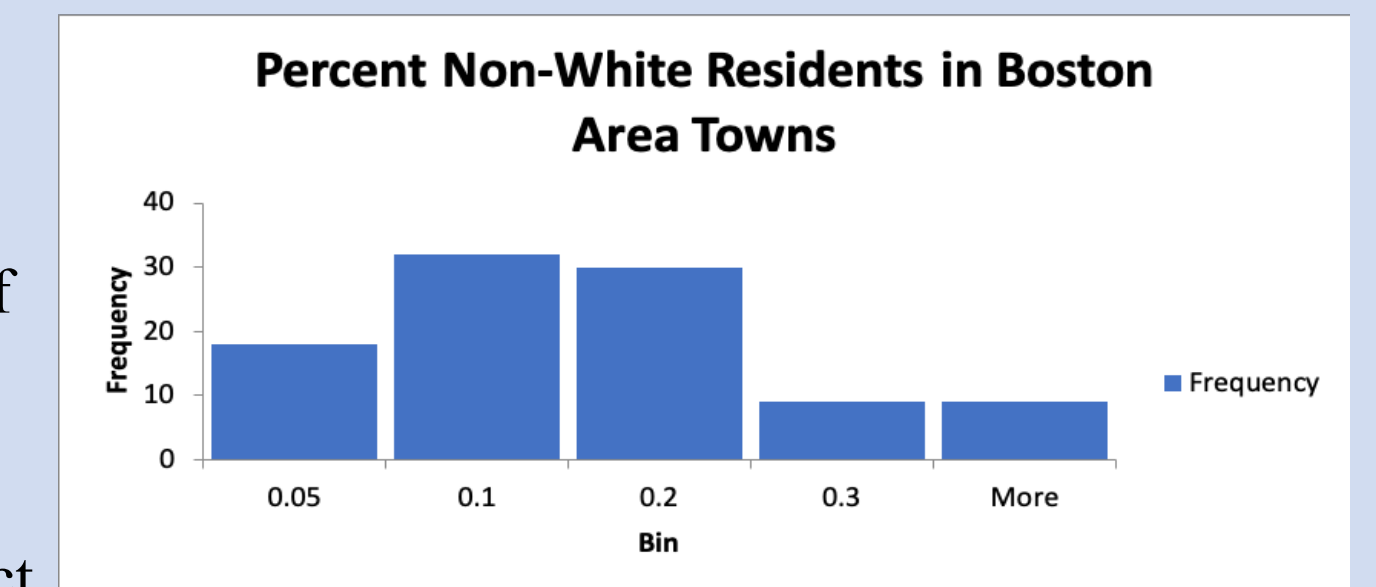


Figure 6: COVID-19 Confirmed Cases and Black Communities



Tables 1 – 4: Percent of Non-White and Black Residents in Boston Area vs. Hot Spots

Discussion

Spatial, visual and statistical analyses in this study reveal a consistent and significant overrepresentation of non-white and Black residents in areas of high confirmed COVID-19 prevalence in the Boston area. Non-white and Black communities are disproportionately represented in areas determined to be hot spots for COVID-19.

These findings are startling and grave, and as such should spur further analysis. Investigating the causes of racial disparities in confirmed COVID-19 prevalence is an important next step. Possible routes of inquiry include the proportion of residents performing essential jobs, access to proper health care, and the prevalence of pre-existing health risk factors related to structural racial inequities such as food access, income levels, population density, and exposure to pollution.