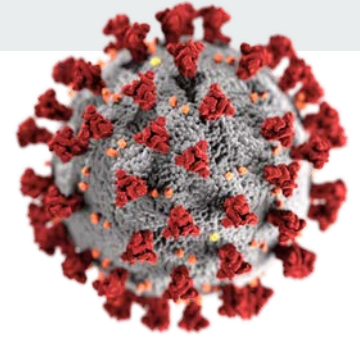




Identifying Neighborhood Characteristics Associated With COVID-19 In Philadelphia

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Himes Lab



Covid-19

- Infectious disease caused by SARS-CoV-2 virus that arose in December 2019
- Spreads primarily from person to person through respiratory droplets
- Increased risk and worst outcomes among racial/ethnic minorities and those who are socioeconomically disadvantaged

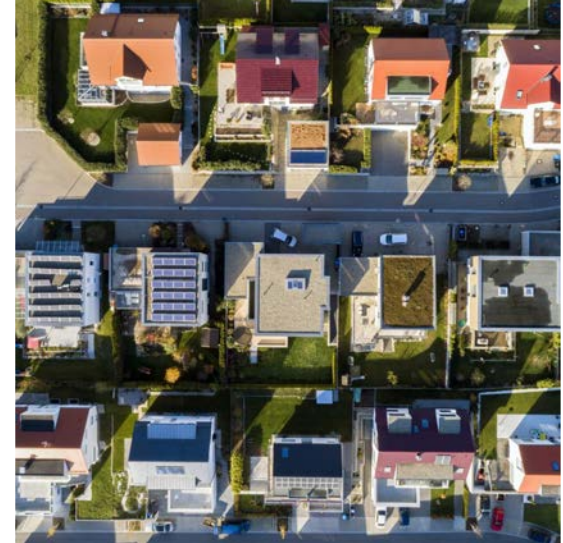


Study Aims

- To investigate COVID effects in Philadelphia
 - Pollution Changes and Asthma
 - Hospitalization Records
 - Testing sites
 - **Neighborhood Characteristics with Positive Cases**

Neighborhood Characteristics

- Physical features of built environment influence well being
 - Quality of housing, presence of basic needs
- Prevalence of certain diseases and health conditions
- Could be divided by zip codes, municipalities, or census tracts





Goal of my Project

- Identify positive associations between different neighborhood characteristics and COVID-19
- Map the associations by zip codes in Philadelphia





Data Sources

- Open Data Philly
 - Philadelphia-based geospatial software firm
 - Provides access to more than 300 data sets to the Philadelphia region
 - Updated COVID case counts

covid_status	zip_code	count
POS	19101	29
NEG	19101	50
POS	19102	56
NEG	19102	496
NEG	19103	1851
POS	19103	217
NEG	19104	3541
POS	19104	630
NEG	19105	25
POS	19105	6
NEG	19106	968

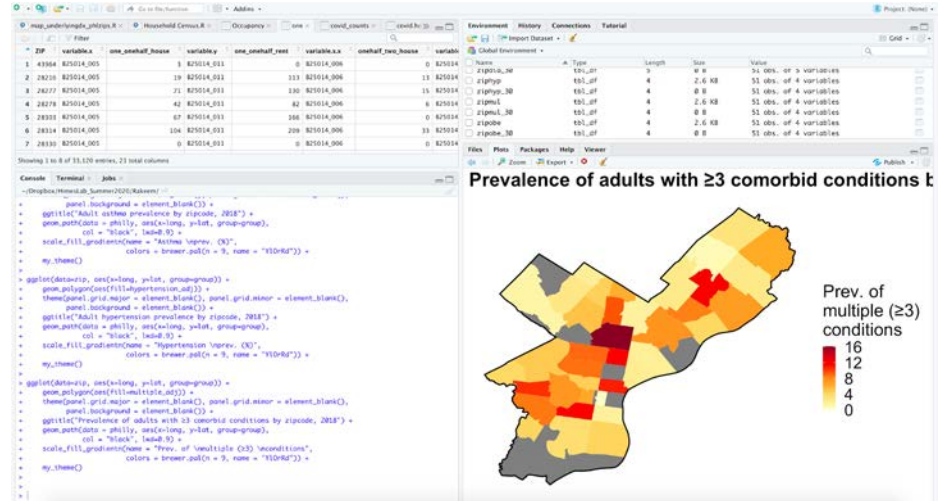


Area Deprivation Index (ADI)

- Created by the Health and Resources Administration for county use
 - Recently refined by researchers at University of Wisconsin-Madison for Census block/neighborhood use
- Ranks neighborhoods by socioeconomic status
 - Includes income, housing quality, education, and employment
- Linked to various healthcare outcomes
 - Higher rates of diabetes and cardiovascular disease, increased utilization of health services, and earlier death

Methods

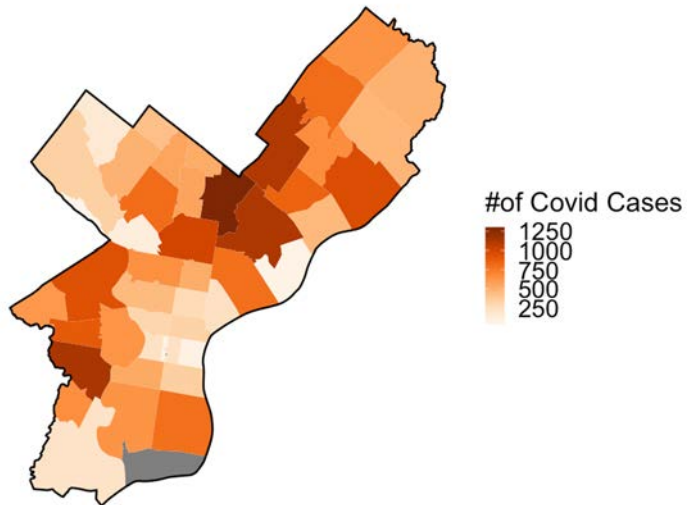
- R programming to pull geospatial data and visualize on maps of Philadelphia
- Looked for associations between Positive COVID-19 Cases in a given zip code, and individual neighborhood characteristics



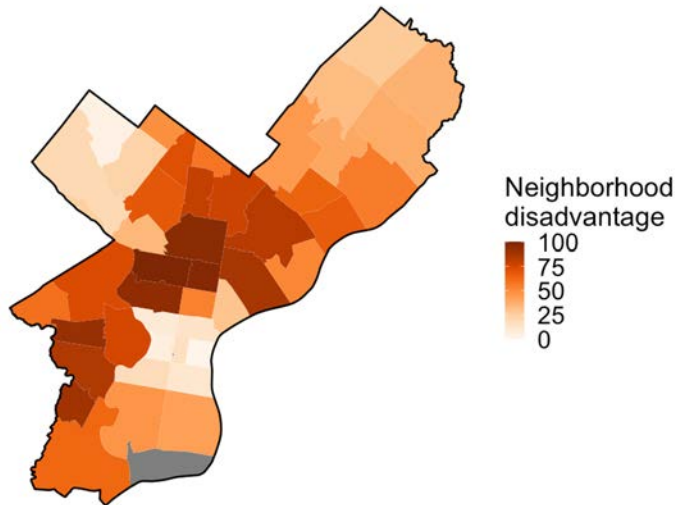


COVID-19 and ADI

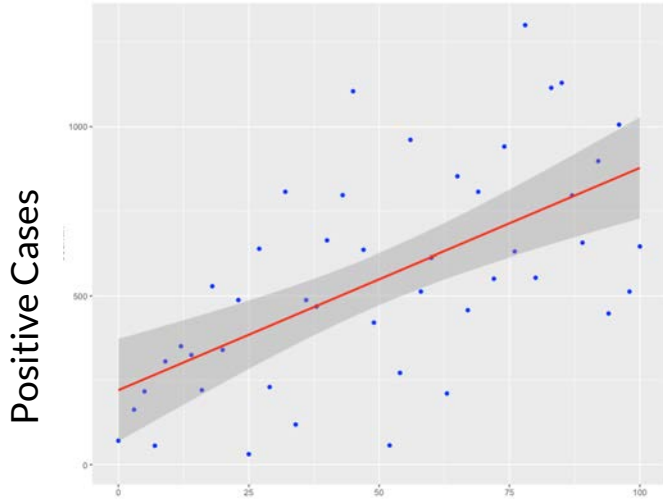
Positive Covid Cases



ADI SCORE

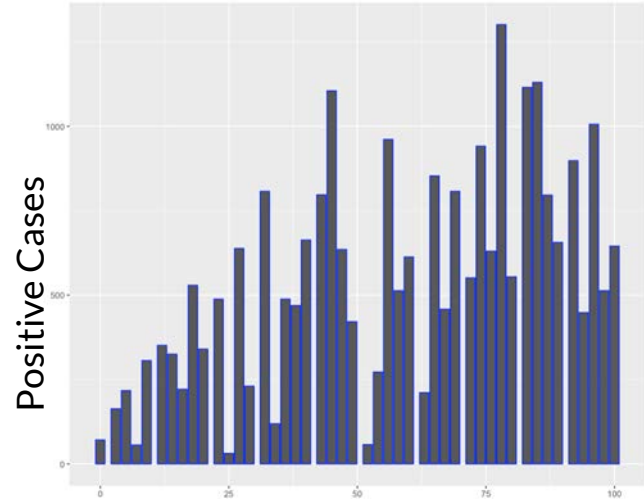


COVID-19 Positively Associated with ADI



ADI

Pearson's Chi-squared test

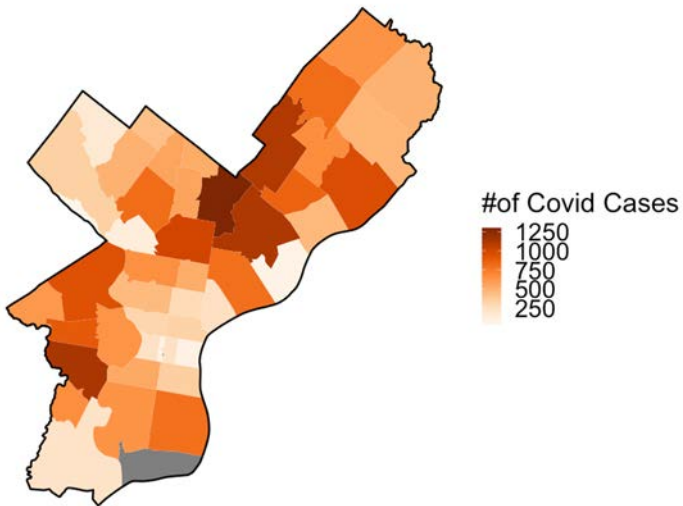


ADI

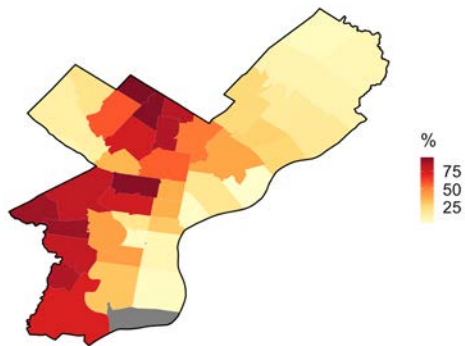
```
data: table(zipcases.adi$count.x, zipcases.adi$ADI)
X-squared = 1932, df = 1890, p-value = 0.2454
```

COVID-19 and Race

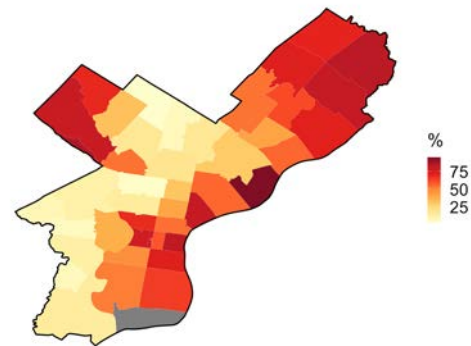
Positive Covid Cases



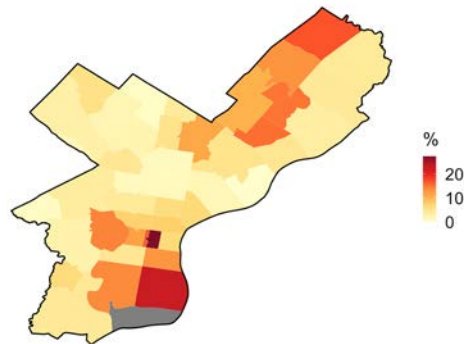
Presence of Black population



Presence of White population

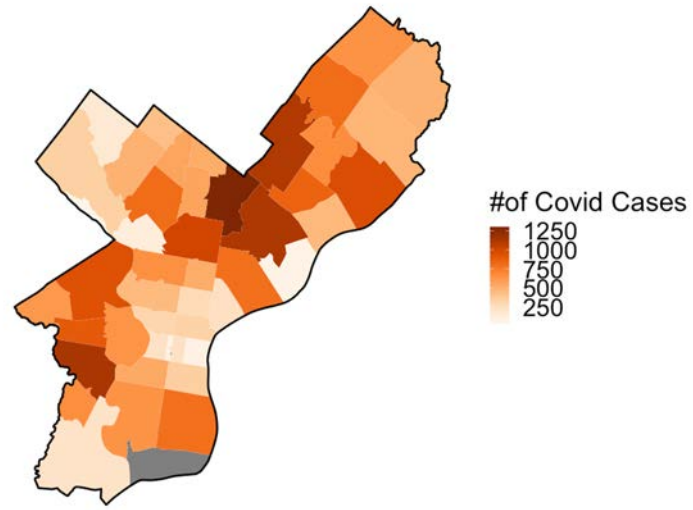


Presence of Asian population

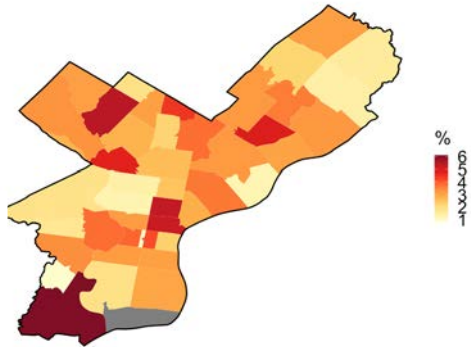


COVID-19 and Race

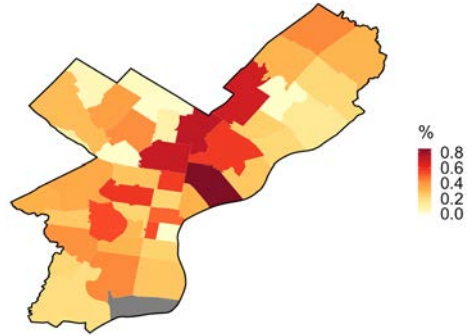
Positive Covid Cases



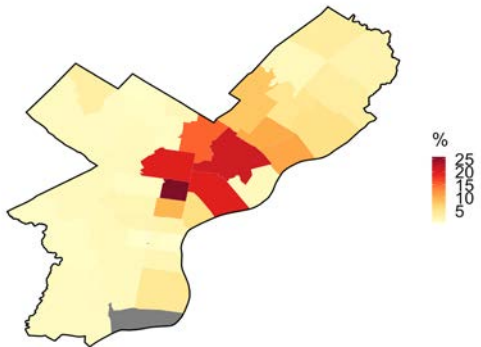
Presence of 2+ races population



Presence of American Indian and Alaska Native population



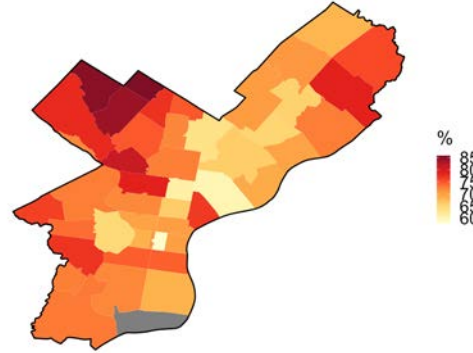
Presence of Other population



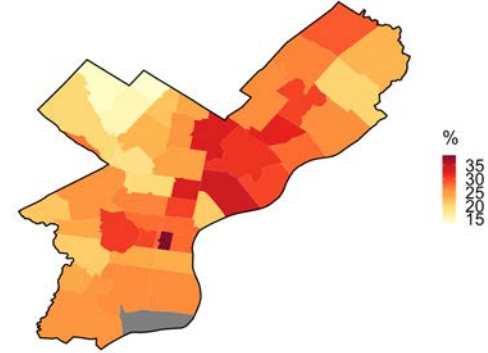
Housing

- ACS Variables
 - Number of Occupants between Renters and Owners
 - Number of Occupants By Race

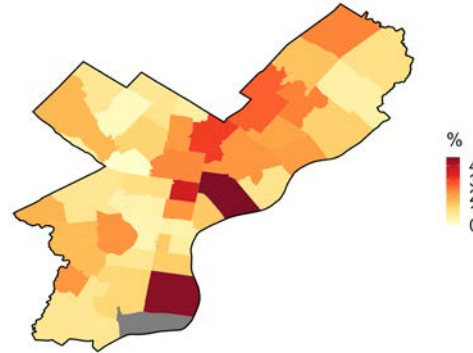
Presence of 0.5 or less occupants (Renters and Ow



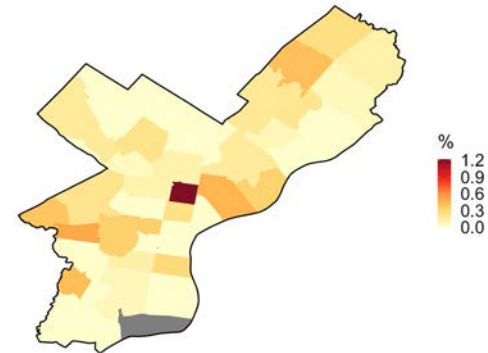
Presence of 0.51-1 occupants (Renters and Owner



Presence of 1.01 -1.5 occupants (Renters and Own



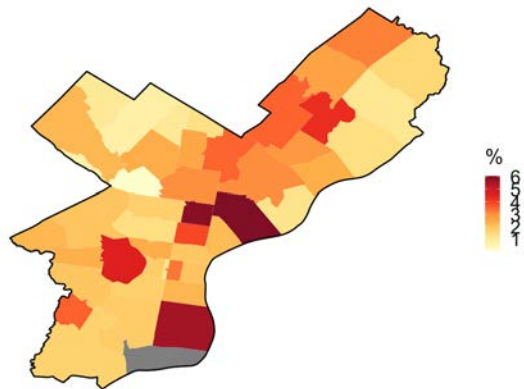
Presence of 2+ occupants (Renters and Owners)



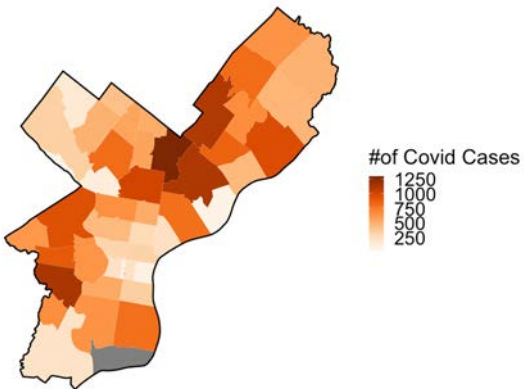


Correlations with Housing and Covid

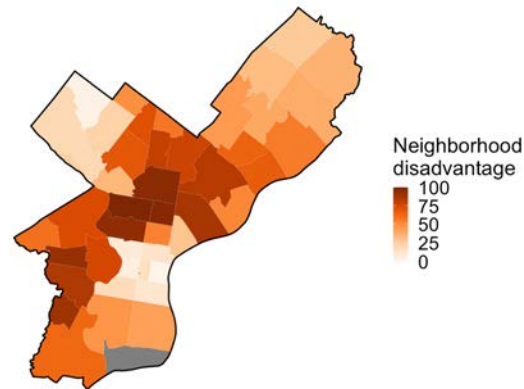
Presence of 1+ occupants (Renters and Owners)



Positive Covid Cases



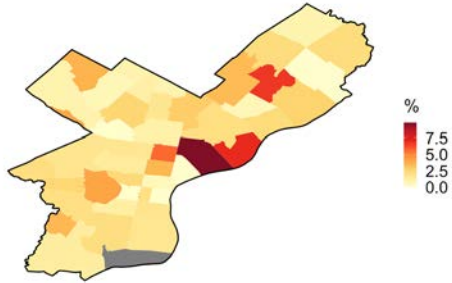
ADI SCORE



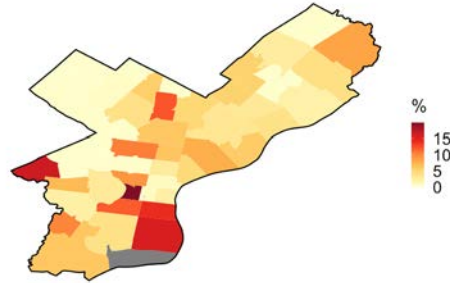


Housing and Race

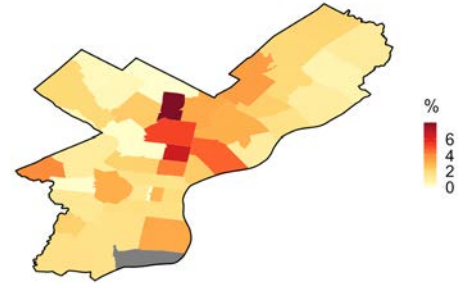
Presence of 1.01 or more occupants (Black)



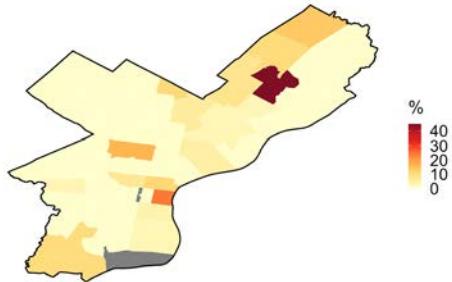
Presence of 1.01 or more occupants (Hispanic)



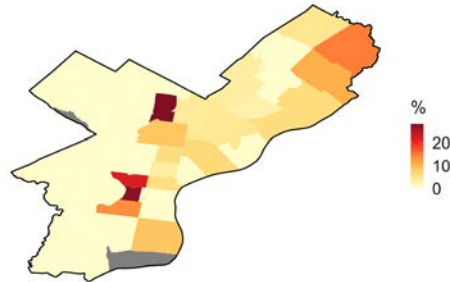
Presence of 1.01 or more occupants (White)



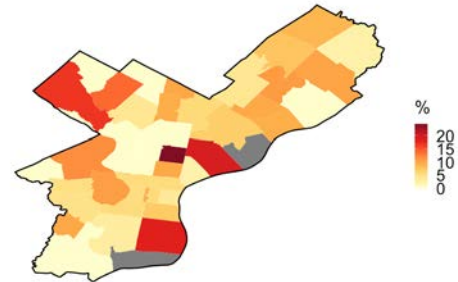
Presence of 1.01 or more occupants (Two or more)



Presence of 1.01 or more occupants (Some other)

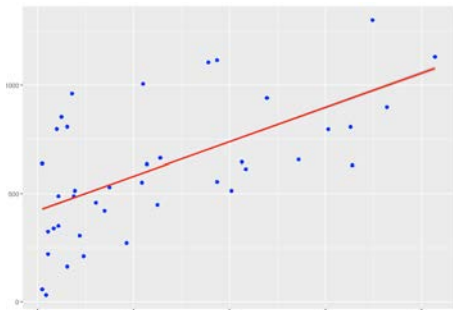


Presence of 1.01 or more occupants (Asian)

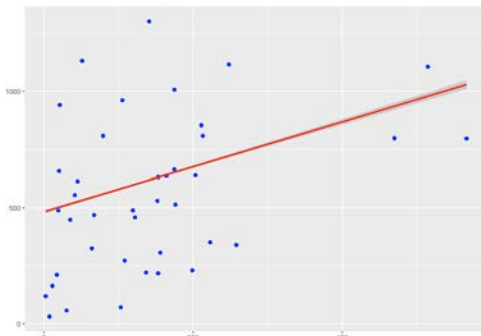




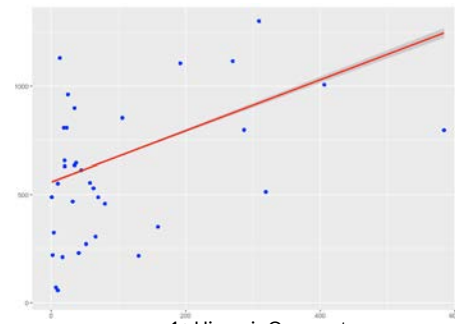
Housing by Race



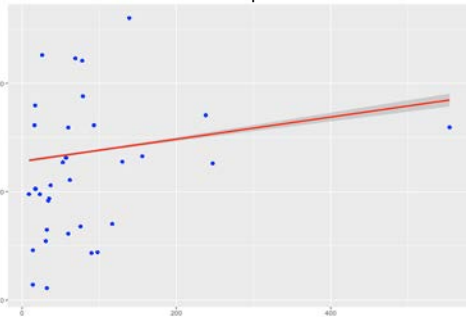
1+ Black Occupants



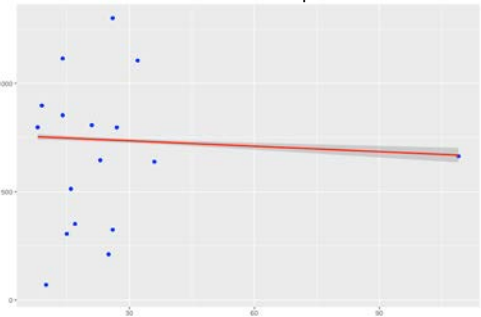
1+ White Occupants



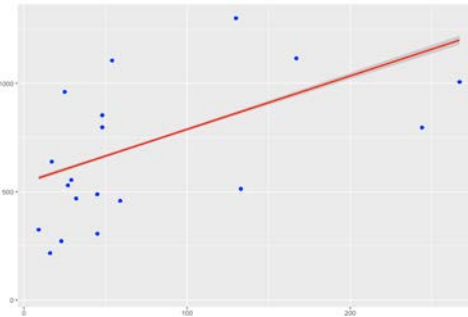
1+ Hispanic Occupants



1+ Asian Occupants



1+ Two or More Occupants



1+ Some Other Occupants



Future

- Further Investigation of Neighborhood Characteristics
 - Links between other diseases or housing characteristics
- Evaluations of COVID-19 Effects in Philly
 - Pollution and Asthma



Lessons Learned

- Growth in my research skills
 - R programming
 - Data manipulation
- How statistics shape Public Health Initiatives
- Importance of National Surveys
- Research career
 - DMD/PhD and informatics research



THANK YOU

- Joanne Levy
- Evelyn Fabian
- LDI
- Dr. Blanca Himes
- Himes Lab