



Crime, House Values and Covid-19 in Chicago

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- Data
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- Crime and Covid-19 Cases
- Conclusion

Introduction

- Crime rates are significantly higher in big cities than in smaller ones or rural areas
- Crime rates affects the quality of life, the economic growth of a society, and individuals' choices regarding housing and traveling
- Crime patterns concern not only researchers, but also policymakers
- Recent advances in the data availability have made urban crime research appealing
- New data sources allow us to have variables at high frequency and more granular levels.

Introduction

- We exploit a rich dataset and we investigate crime data in Chicago for the years 2001-2021
- We explore two aspects of this city: housing prices and Covid-19 cases
- Our goal is to obtain insights on how the housing market in each community area reacts to changes in criminal activities
- We investigate whether stay-at-home order affected different type of crimes
- Lockdowns might affect domestic crimes and homicides

Literature Review

- Becker (1968) : First formulation of the economics of crime
- Rizzo (1979): Hedonic price model; negative effects of crime on rents and house values of Chicago
- Naroff, Hellman, and Skinner (1980): Simultaneous equations model; negative relationship of crime rates and housing values in Boston
- Boman and Gallupe (2020); Bhuiyan (2020) : Crimes decreased during pandemic in the US
- Bullinger, Carr, and Packham (2020) :
 - Increase in domestic-violence related calls to the police in Chicago
 - Decrease in domestic crimes and arrests due to stay at home order

Data

- Chicago Crime Data

- Extracted from the Chicago Police Department's CLEAR (Citizen Law Enforcement Analysis and Reporting) system
- Includes daily crime incidents that occurred in Chicago from 2001 to 2021
- Variables used: type of crime, arrests, districts, geographic location
- 7,315,580 observations

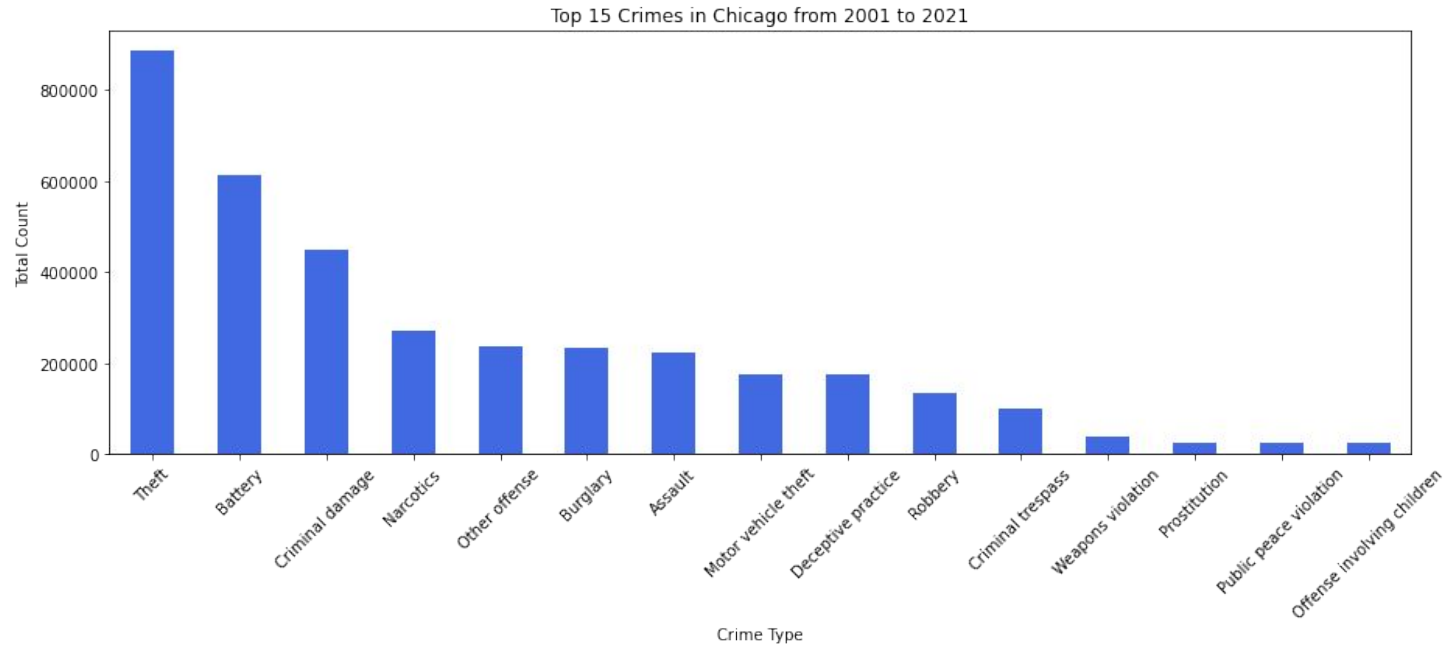
- Land Value Data

- Extracted from Zillow Website
- Represents a smoothed, seasonally adjusted measure of typical home value across region and housing type
- Reflects the typical value for homes in the 35th to 65th percentile range

- Covid-19 Data

- Weekly positive cases by ZIP code as provided by City of Chicago
- Time range is from 01-03-2020 to 04-25-2021

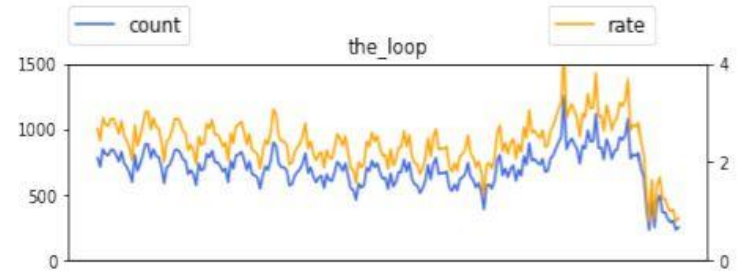
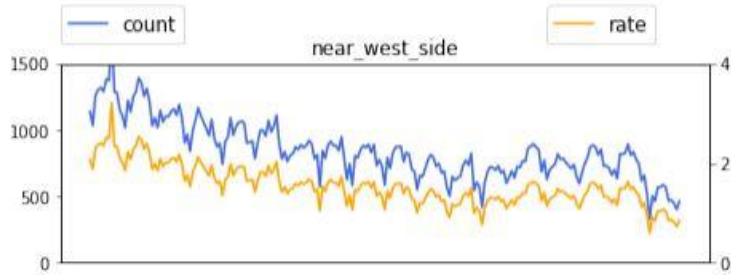
Crime and Housing Prices



Crime and Housing Prices

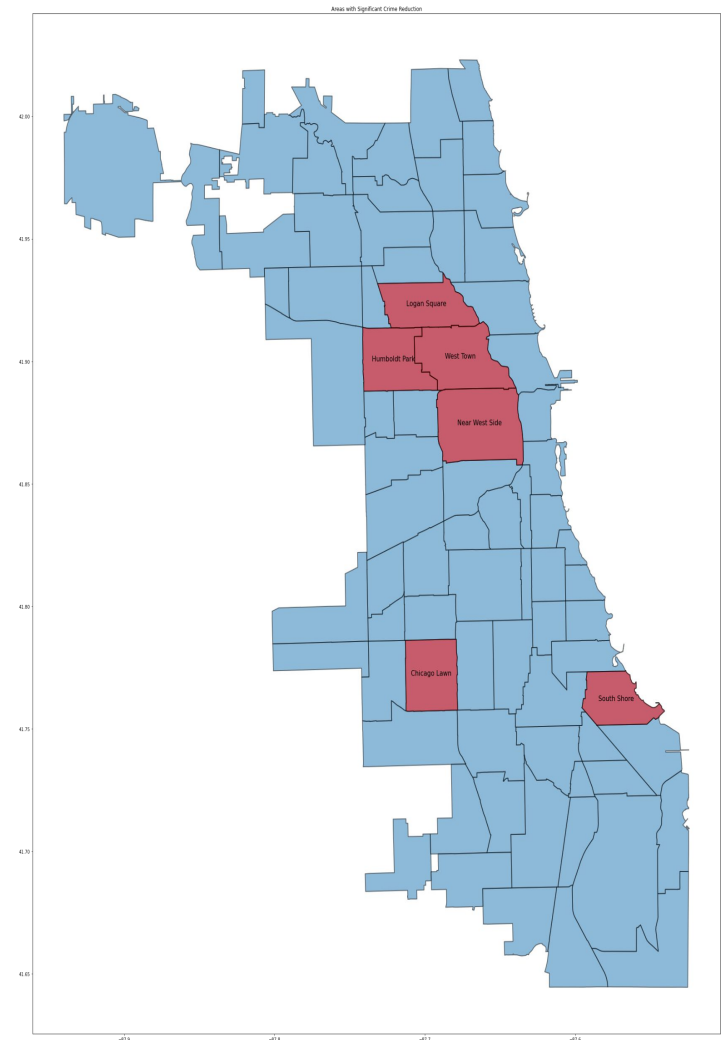
- Some Observations

- Total crime count and crime rate have been declining for almost all community areas.
- Periodic fluctuations in the trend indicate seasonality in criminal activities.
- There was a sharp drop in crime for the Loop in 2020.



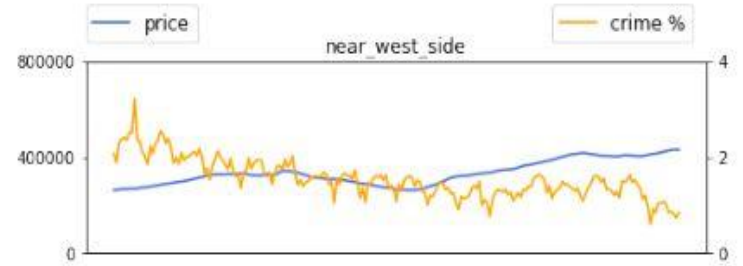
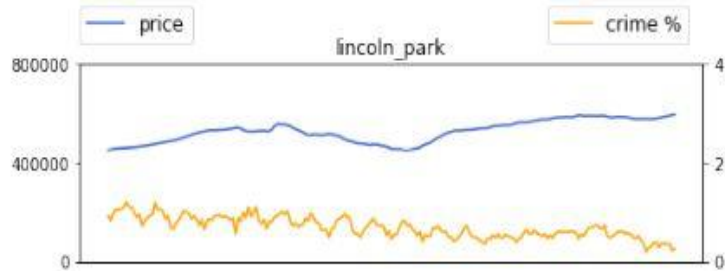
Crime and Housing Prices

- Some Observations Cont.
 - While the downward trend in crime is shared by many community areas, some experienced more significant drops than others.
 - Notably, the cluster of community areas in the northern part of Chicago.
 - Effective policing? Gentrification?

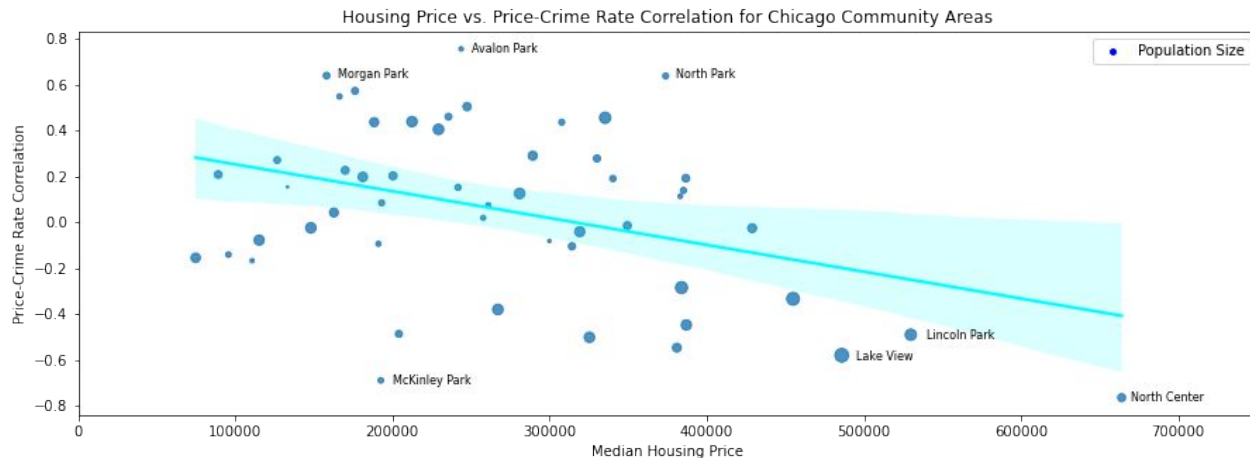


Crime and Housing Prices

- Some Observations Cont.
 - Similar housing price trends in most community areas.
 - It's difficult to identify possible relationships between housing prices and crime using line plot alone.



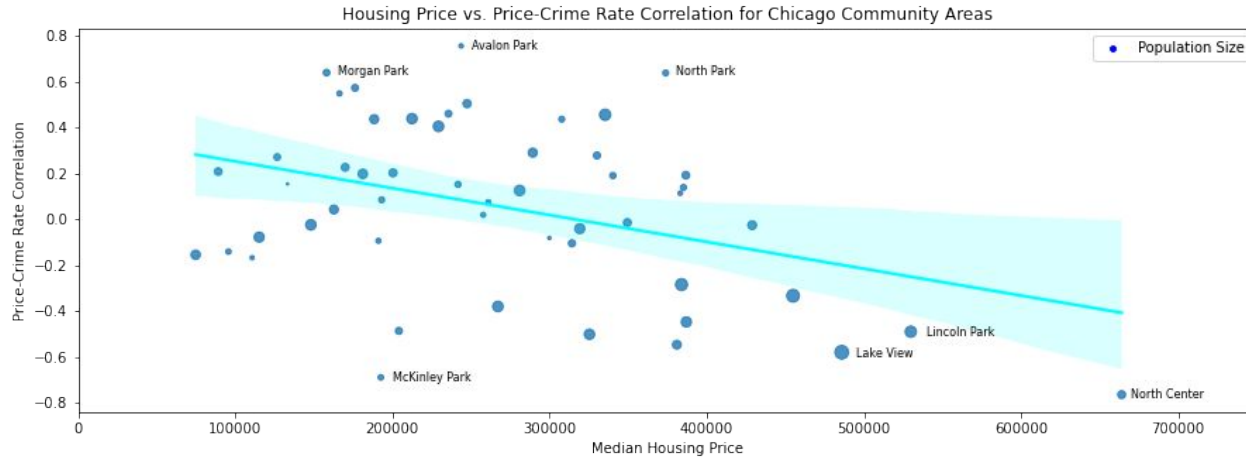
Crime and Housing Prices



- **Correlation Analysis**

- We calculate the correlation between monthly housing prices and crime rate (period t , $t-1$, and $t-2$) for each community area.
- For each community area, the correlations are similar for all three choices of the crime rate period. Fixing the crime rate period, the correlations could be drastically different for different areas.

Crime and Housing Prices

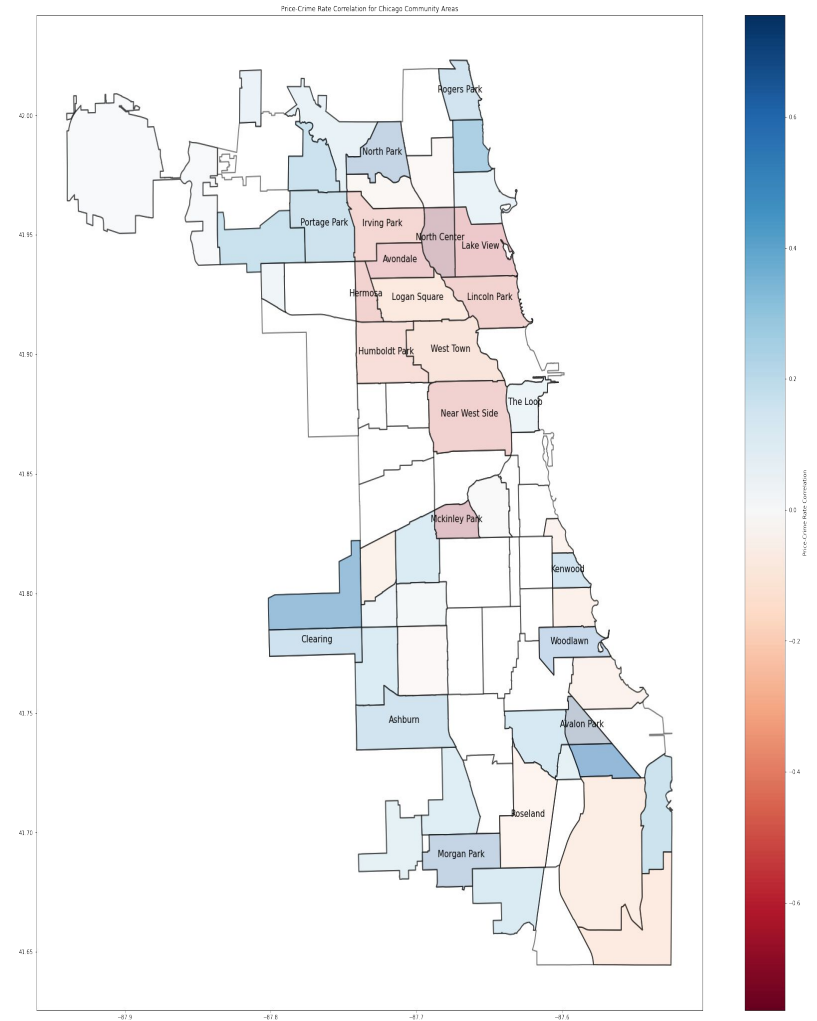


- Correlation Analysis Cont.

- The correlation becomes more negative as the median housing price increases.
- It could be that housing market participants in affluent community areas with good amenities are more sensitive to criminal activities.

Crime and Housing Prices

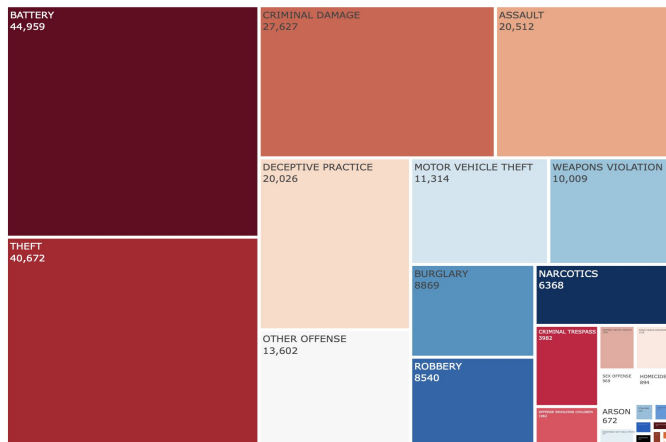
- Correlation Analysis Cont.
 - We observe a familiar cluster in the northern part of the city.
 - Additional evidence is needed to establish causal links.



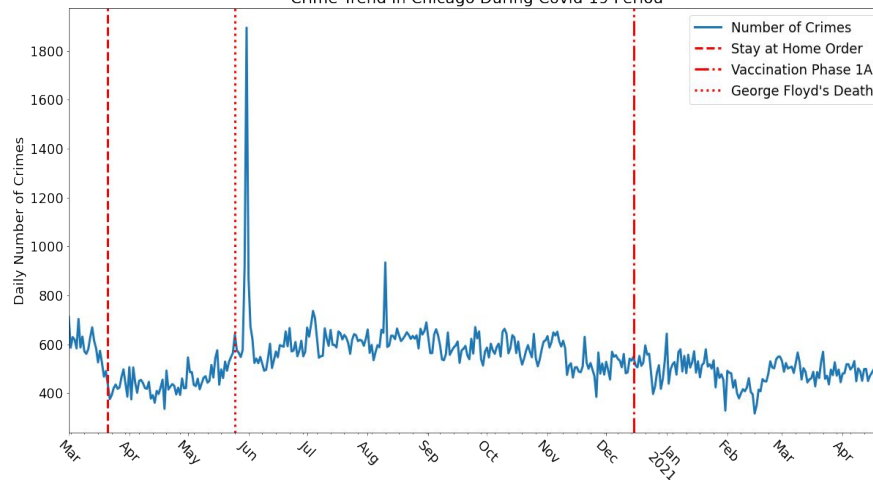
Crime and Covid-19 cases

- Top 5 most common types of crime: battery, theft, criminal damage, and assault
- No large fluctuations in the number of crimes overall
- A huge spike of crimes reported at around the time of George Floyd's death.

Major Crimes in Chicago during Covid-19 era

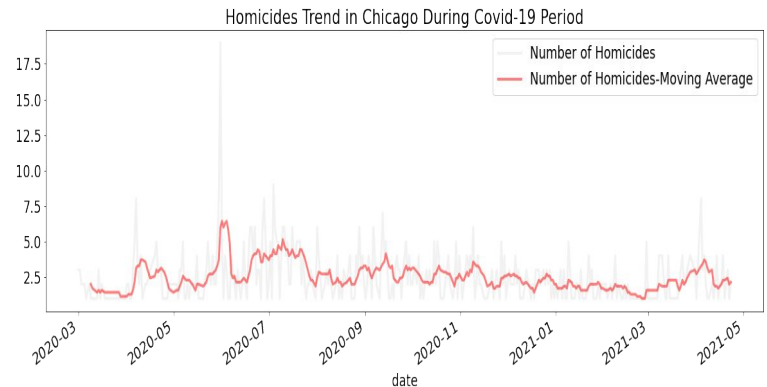
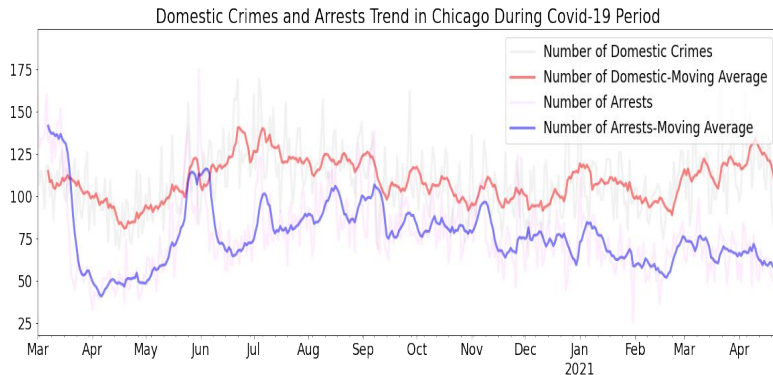


Crime Trend in Chicago During Covid-19 Period



Crime and Covid-19 cases

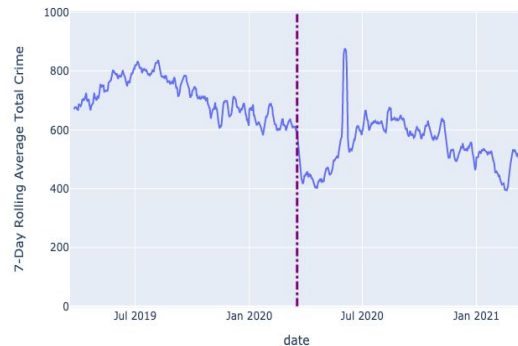
- There was not a huge increase in the volume of domestic-related crimes
- Number of arrests dramatically decreased after the stay-at-home order before spiking at around the time of George Floyd's death
- A peak in homicides after George Floyd's death,
- Overall, no significant changes in homicides number during Covid-19 era.



Comparison on Crime Pre and Post Covid-19

- Compared to Pre Covid-19 era, there is an overall reduction on total number of crimes just after the stay-at-home order was enacted
- For domestic crimes and homicides, there seem to be a significant change shortly after the stay-at-home order was enacted.
- However, the levels quickly dissipate to pre covid era

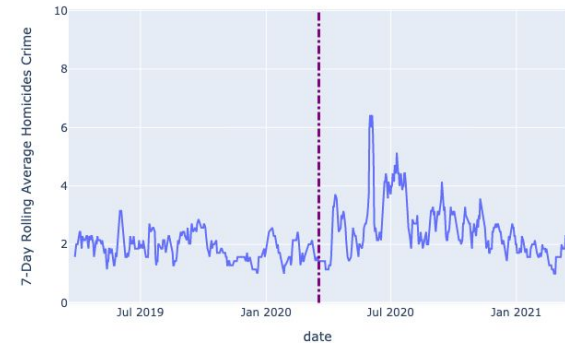
Comparison of Total Number of Crime Pre and Post Covid-19 Era



Comparison of Domestic-Related Crime Pre and Post Covid-19 Era



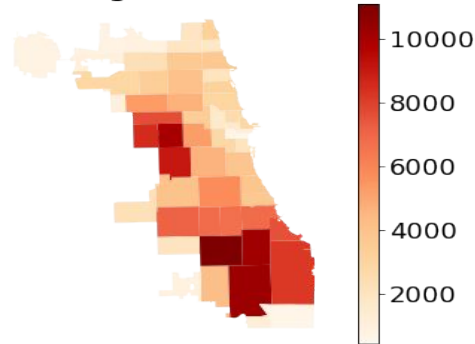
Comparison of Homicides Crime Pre and Post Covid-19 Era



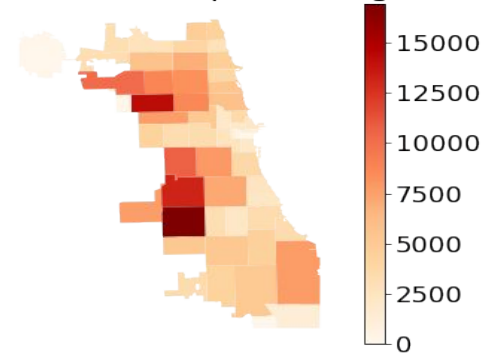
Crime and Covid-19 Heatmaps

- Severity in covid-19 cases and crime do not cover the same area
- Most crime-prone areas include Auburn Gresham, Roseland, Pullman, and Garfield Park
- Areas with most severe covid-19 infections include Westlawn, Chicago Lawn, Belmon Cragin, Hermosa, Archer Heights, and Brighton Park.

Crime Incidents During Covid-19 Period in Chicago



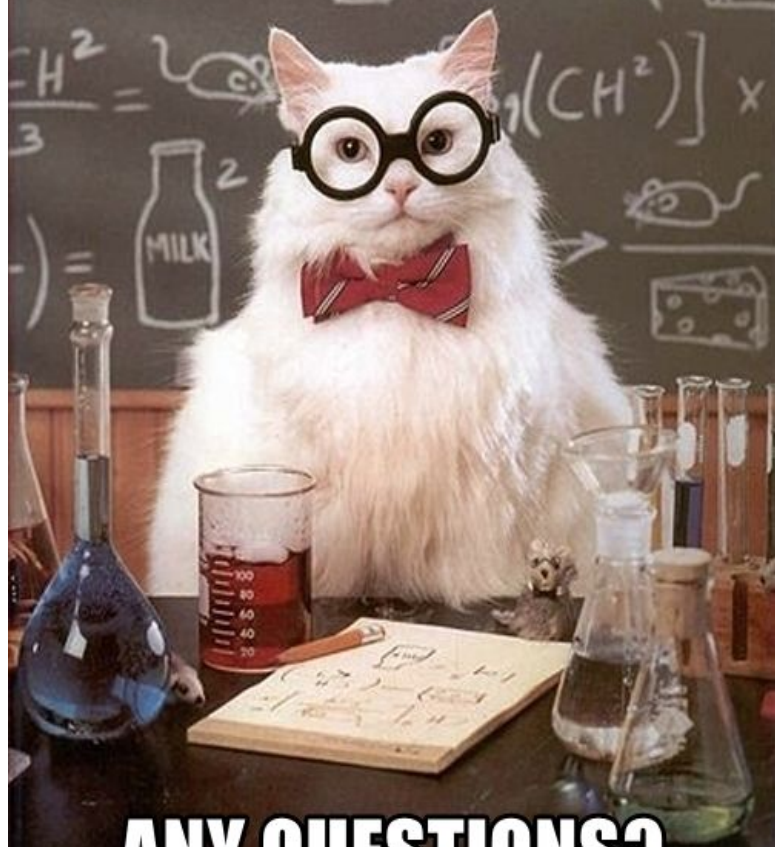
Covid-19 Heatmap in Chicago



Conclusion

- This project applies the Chicago crime data to the housing market and the Covid-19 pandemic settings.
- We find that the correlation between the housing prices and crime vary by community. And local economic conditions may play a role in determining how sensitive the housing price in each area is to criminal activities.
- Chicago did not experience any significant change in homicides, domestic crimes and total crimes for the entire covid-19 period that we examined
- When compared to the pre-covid-19 era, we find a sizeable reduction in the overall number of total crimes after the stay-at-home order was enacted.

THANK YOU



ANY QUESTIONS?