A Research Paper on Hate Crimes in New York City and how it compares to the top and bottom cities in the rank of 10 most populated cities in United States based on their median household income in 2022

Final Paper for Introduction to Applied Data Science Course

Anne Mercado

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PART 01

Introduction

Abstract

Inscope

Using the data from *Hate Crime Statistics of FBI's Uniform Crime Reporting (UCR Program)*, this report investigates on:

- Progression of hate crimes in New York City
- Comparison to the top and bottom cities in the top 10 list of most populated cities based on median household income
- Present trends, spikes and falls of the numbers in New York City
- Identify targeted groups in New York City and how it compares to the two other cities
- Present the correlation and dependence of hate crimes reported on the median household data from the identified three cities.

Introduction

Definition

Hate Crime is a criminal offense against a person or property *motivated in whole or in part by an offender's* ***bias against race, religion, disability, sexual orientation, ethnicity, gender or gender identity*** according to FBI.

Timeline

The history of hate is long and unfortunately still continue to occur until today.

- 1968: The first federal hate crime statute was signed to a law
- 1989: Hate Crime Statistics

Literature Review

- Hate crimes has doubled starting 2014
- New York City is widely recognized as the America’s melting pot.
- Diverse makeup of people of all genders coming from different continents and religions.

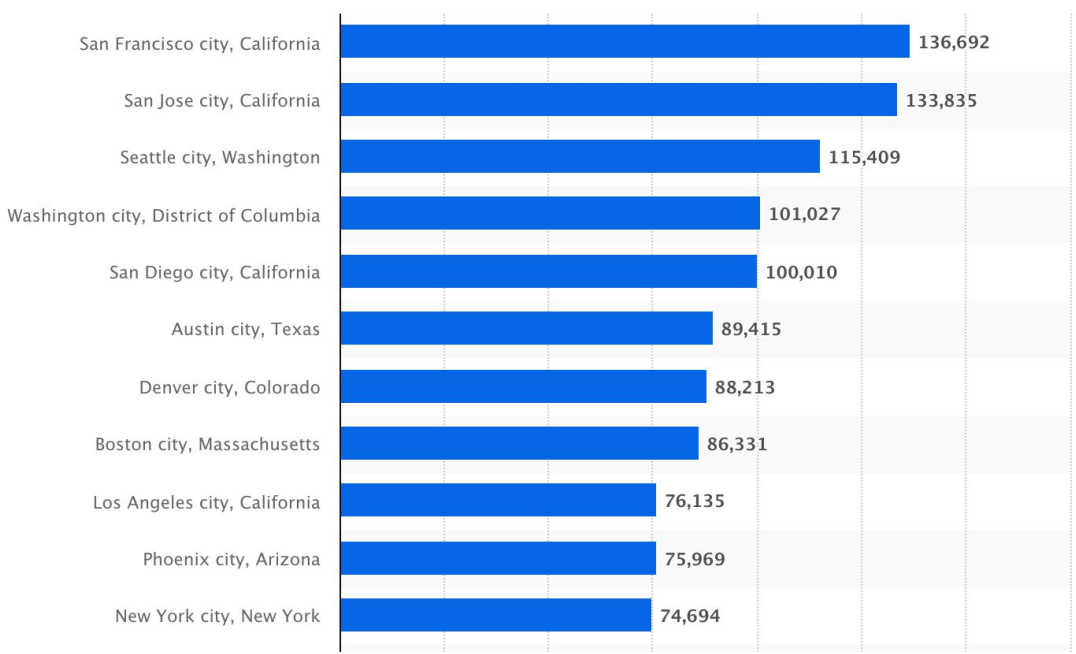
Literature Review

There are other factors influencing hate crimes based on other studies.

- Social Disadvantage
- Urban Poverty
- Education Level
- Socioeconomic Factors

Literature Review

- San Francisco is 1st on the list
- The 10th spot is Phoenix
- New York City only ranks 11th



Statista (2023)

PART 02

Data and Methodology

Data Description

- Utilizes the Hate Crimes Statistics dataset
- Annual statistics of number of incidents, offenses, victims, and offenders in the reported crimes
- Uses as Bureau of Census Data on median household income estimates per city

Methodology

- Temporal Analysis
- Distribution Analysis
- Comparative Analysis
- Identification of Targeted Groups
- Regional Disparities and Socioeconomic Influence through correlation and regression analyses

Data Limitation

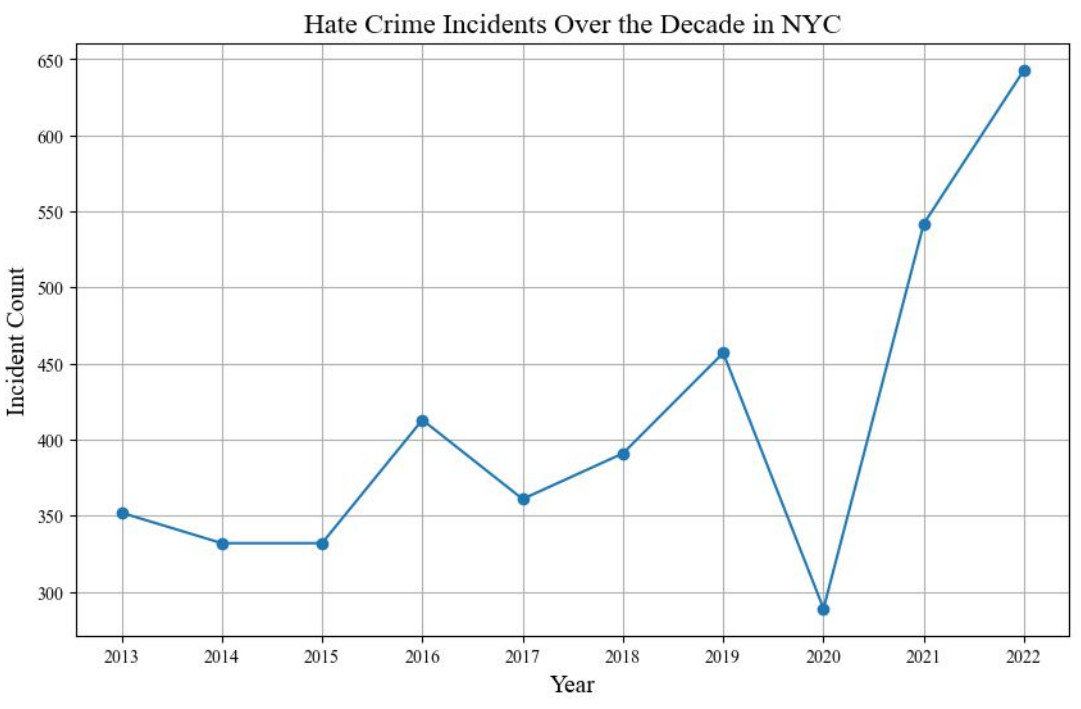
- Data is only capturing crimes reported.
- Median household income are estimates.

PART 03

Results and Analysis

Temporal Trends in New York City

- Continuous rise from 2014/2015
- Big drop in 2020
- Surge of reports in 2021 to 2022



PART 03

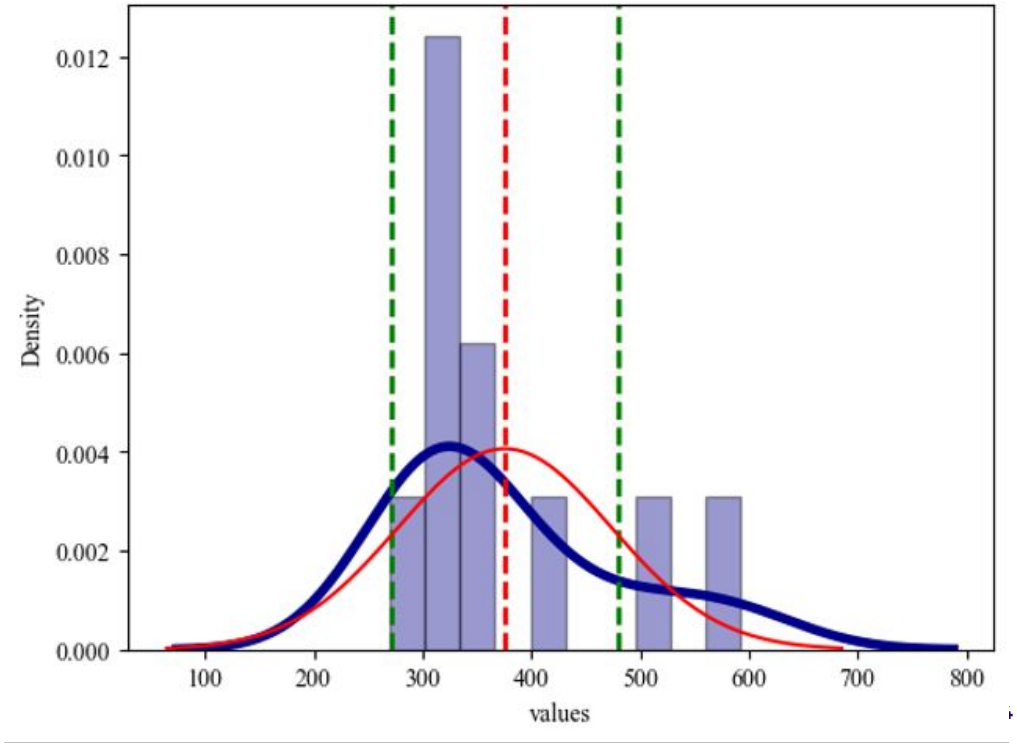
Distribution Analysis

Mean = 375.60 and

Standard deviation = 103.52

Percentile:

- 1 percentile = 273.33
- 5 percentile = 286.65
- 25 percentile = 308.75
- 50 percentile = 334.50
- 75 percentile = 407.50
- 95 percentile = 556.45
- 99 percentile = 584.89



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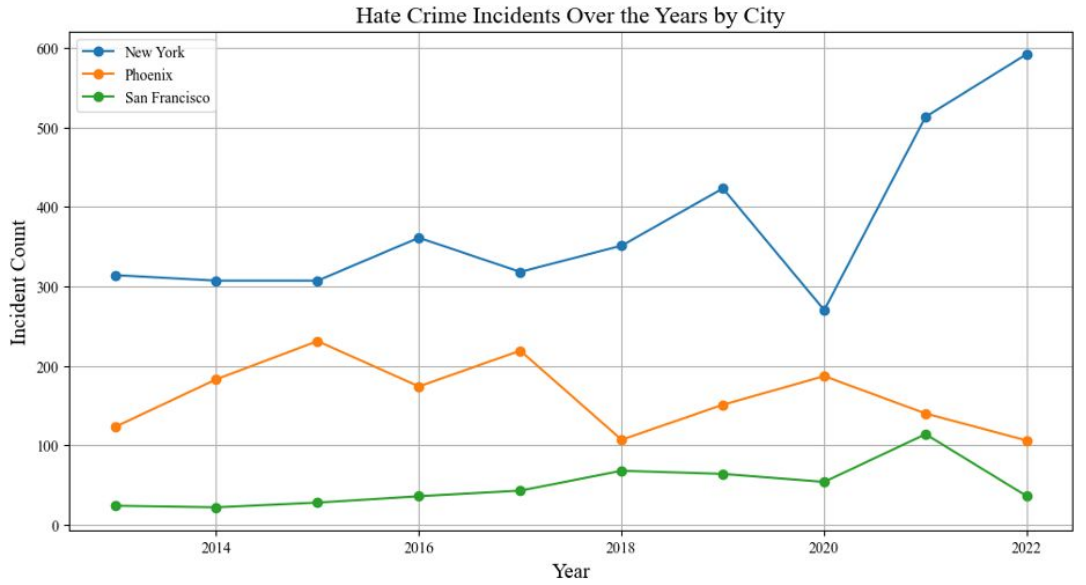
Comparative Analysis

- Different levels of hate crime activities in three different cities
- New York City has significantly, in average, higher hate crime numbers



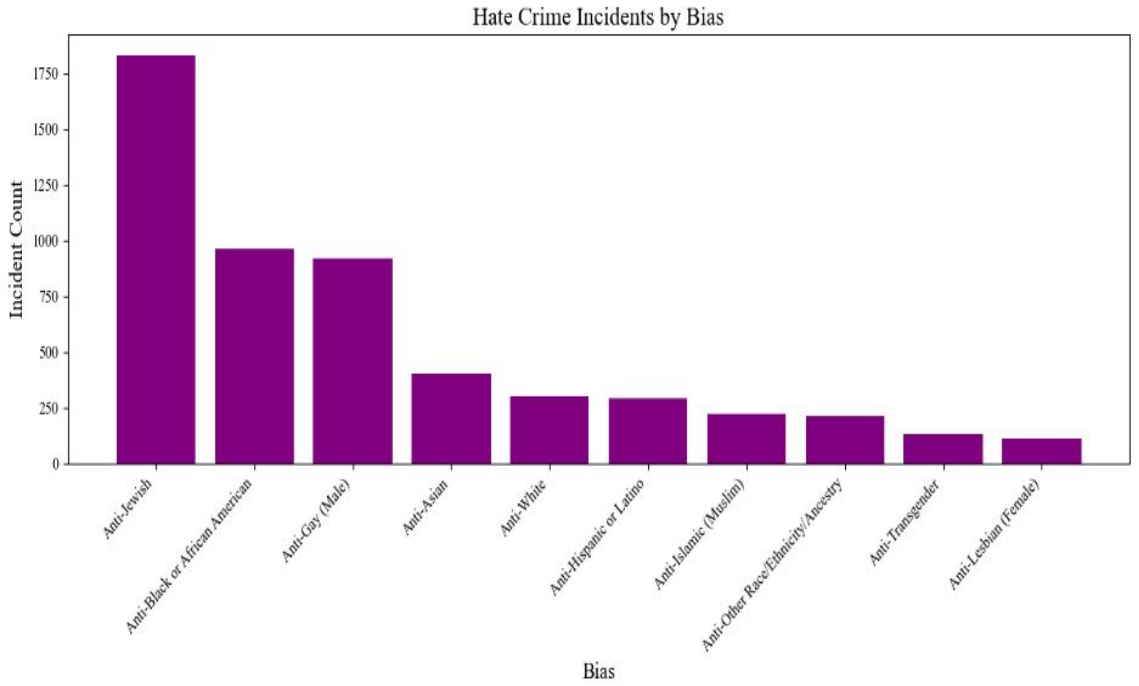
T-Test Analysis

- Use to differentiate New York City from the two cities
- **New York City to San Francisco:**
  - ***T-statistic***: 9.636031586405965
  - ***P-value***: 1.5752538463642976e-08.
- **New York City to Phoenix:**
  - ***T-statistic:*** 6.000008555980327
  - ***P-value:*** 1.1269773625052149e-05

PART 03

Targeted Groups

- Top 3 hate crimes reported from the 3 cities:
  - Anti - Jewish
  - Anti - Black
  - Anti - Gay (Male)



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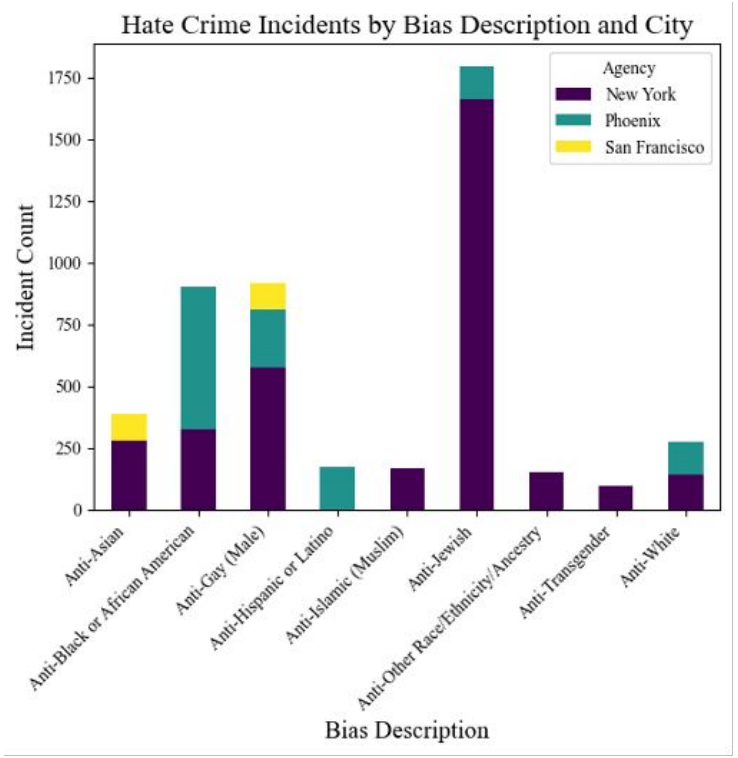
Targeted Groups

- Difference in contribution in the numbers between the three cities
- New York City contributes majorly to the top biases



Correlation Analysis

- Incident count shows weak positive correlation with time
- Medium to Strong correlation between incident count and median household income

	Year_x	incident_count	MHI
Year_x	1.000000	0.090213	0.269927
incident_count	0.090213	1.000000	-0.662141
MHI	0.269927	-0.662141	1.000000

Regression Analysis

OLS Regression Results

Dep. Variable:	incident_count	R-squared:	0.438
Model:	OLS	Adj. R-squared:	0.420
Method:	Least Squares	F-statistic:	24.20
Date:	Sun, 10 Dec 2023	Prob (F-statistic):	2.70e-05
Time:	15:04:10	Log-Likelihood:	-195.67
No. Observations:	33	AIC:	395.3
Df Residuals:	31	BIC:	398.3
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	397.4486	53.232	7.466	0.000	288.882	506.015
MHI	-0.0032	0.001	-4.920	0.000	-0.005	-0.002

Omnibus:	3.278	Durbin-Watson:	0.495
Prob(Omnibus):	0.194	Jarque-Bera (JB):	2.626
Skew:	0.690	Prob(JB):	0.269
Kurtosis:	2.926	Cond. No.	2.65e+05

Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 2.65e+05. This might indicate that there are strong multicollinearity or other numerical problems.

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PART 04

Conclusion

Conclusion

- Hate crimes vary in different geographic areas
- Top targeted groups/biases being Anti-Jewish, Anti-Black and Anti-Gay (Male).
- New York City largely contributes to the numbers of these top biases
- There is medium to strong negative correlation between median household income and hate crimes reported.
- Model used proved to have statistical significance.

Conclusion

- Analysis holds true when comparing the number of crimes reported between San Francisco, Phoenix and New York City.
- San Francisco with the highest median household income and lowest hate crimes reported among the three
- New York City being 11th on the list, reported highest numbers of hate crime among them

Conclusion

- Only investigates fraction of the bigger picture of the current situation of hate crime
- Needs further study and research to be able to address other factors influencing the crime

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