

Evaluating Effects of a Global Pandemic on Arrest Rates and Police Violence in Broward, Florida

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Motivation

- The purpose of this analysis is to look at a given US county (Broward, Florida) and understand what arrest rates and police violence was like during a global pandemic
- This was also a time of important social and political change with an emphasis on police reform

Data

Florida Department of Law Enforcement

- Arrests for crimes against another person

Census.gov

- Data on Broward County population to standardize rates

Mapping Police Violence (2013-present)

- Largest and richest dataset on victims of police violence

Research Questions

- Q1: How do arrest rates in Broward, Fl. compare in a 2019 (non-covid year) vs. 2020?
- Q2: Who is more likely to be a victim of police violence in Broward county?

Methodology

Q1: How do arrest rates in Broward, Fl. compare in a 2019 (non-covid year) vs. 2020?

- Percent change to see if arrests went up or down
- Difference of two proportions

Q2: Who was more likely to be a victim of police violence in Broward county during the pandemic?

- Poisson regression
- Relative risk

Results for Q1

	RATES PER 100,000			
	2019	2020	Percent change	Note
Crimes against peoples arrest	289.4503375	257.0491803	-11.19402985	ALL TIME LOW
Aggravated Assault arrests	85.0144648	82.03150113	-3.50877193	ALL TIME LOW
Forcible Sex Offense arrests (rape/fondling)	3.960141434	3.291546127	-16.88311688	ALL TIME LOW
Homicide (murder/arrests)	3.085824494	2.931533269	-5	
Intimidation Arrests	2.62295082	1.182899389	-54.90196078	
Kidnapping/Abduction arrests	1.080038573	0.565734491	-47.61904762	
Nonforcible Sex Offense arrests	8.177434908	4.423015108	-45.91194969	ALL TIME LOW
Simple Assault arrests	194.4583735	167.6117004	-13.80587146	ALL TIME LOW
Miscellaneous arrests	1347.065252	699.2992607	-48.0872022	ALL TIME LOW

Hypothesis Testing

H₀: The difference in proportion of arrests in 2019 and 2020 = 0

H_A: The difference in proportion of arrests in 2019 and 2020 \neq 0

Results

	Lower bound	Upper Bound	reject/accept H0
Crimes against peoples arrest	0.015	0.049	reject
Aggravated Assault arrests	-0.016	0.022	fail to reject
Forcible Sex Offense arrests (rape/fondling)	-0.019	0.021	fail to reject
Homicide (murder/arrests)	-0.020	0.020	fail to reject
Intimidation Arrests	-0.018	0.021	fail to reject
Kidnapping/Abduction arrests	-0.019	0.020	fail to reject
Nonforcible Sex Offense arrests	-0.016	0.024	fail to reject
Simple Assault arrests	0.009	0.045	reject
Miscellaneous arrests	-0.694	-0.678	reject

Poisson Regression

Predictors:

- Race (White, Black, Asian, Native American, Pacific Islander, Hispanic)
- Gender (Male, Female, Transgender, Unknown)
- Suspected of mental illness? (Y/N)
- Suspect armed? (Y/N)
- Did the police have a body camera? (Y/N)

Dependent variable:

- Number of victims to police violence in Broward county

About the model

Notes about model:

- Temporal coverage: January 23, 2020 - October 29, 2021
- Of 1,587 observations, 443 are removed due to missingness of data
- Overdispersion is accounted for

Reference groups:

- White
- Male
- No mental illness
- Not armed
- No body camera

Results

Predictor	Coefficient	relative risk	p-value
(Intercept)	-4.548	0.011	<0.001
Gender1	-1.093	0.335	<0.001
Gender2	-17.011	0.000	0.997
Gender3	-17.588	0.000	0.996
Race1	-0.898	0.407	<0.01
Race2	0.718	2.051	<0.01
Race3	-15.502	0.000	0.990
Race4	0.389	1.475	0.229
Race5	-15.778	0.000	0.992
Race6	-15.258	0.000	0.993
Mental_illness1	0.551	1.735	<0.01
Armed_status1	-0.270	0.763	0.150
Body_camera1	-16.267	0.000	0.967

Relative risk:

- Females are about 70% less likely to be killed by police in Broward county than their Male counterparts
- Black individuals are 100% more likely to be killed by police in Broward county than their White counterparts
- People with mental illness are 70% more likely to be killed by police in Broward county than people with no mental illness

Questions?
