RACE, CRIME, AND POLICE INTERACTION

FEDERAL RESERVE BANK OF BOSTON ECONOMIC RESEARCH CONFERENCE SERIES: RACIAL DISPARITIES IN TODAY'S ECONOMY, 64TH ECONOMIC CONFERENCE

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Motivation: Economic disadvantage, crime, and police contact are highly concentrated by place

3 to 5% of places or street segments in a city generate at least 50% of crime (Sherman et al., 1989; Weisburd, 2006).

Racially isolated neighborhoods of concentrated disadvantage are more likely to have "hot spots" of crime and police contact (Braga & Weisburd, 2010; Sampson, 2011).

Disparities by place are fundamentally important for thinking about who is most likely to encounter a police officer and the context of discretionary activities like the decision to stop and question a crime suspect or make an arrest.

What role does concentrated disadvantage and crime have in explaining racial disparities in police contact?

1. Review of research on what is known about the association between place environments and racial disparities in police contact

2. Examine aggregate patterns of racial disparities in poverty, victimization, and police interactions

3. Examine how much population level racial disparities in arrests is associated with differences in city and neighborhood level variation in concentrated disadvantage

Concentrated disadvantage important for explaining racial disparities crime and police contact

- In very few large U.S. cities is there a single poor majority white neighborhood that parallels the poorest majority black neighborhoods (Sampson & Wilson, 1995)

- A significant share of the racial disparity in crime and victimization can be explaining by city and neighborhood level differences in joblessness and other forms of concentrated disadvantage (Sampson, 1987; Parker and McCall, 1999; Krivo and Peterson, 1996, 2006; Sampson et al., 2005; Strom and MacDonald, 2008)

- Some evidence that neighborhood level differences in disadvantage explain a significant share of the racial disparities in juvenile arrest rates (Sampson, 1986; Kirk, 2006)

Police deployment and practices vary by geography

- Deployment of police by geography in cities exposes officers in different units to varying levels of crime and disorder – *likely results in different norms around enforcing the law* (Klinger, 1997)

- Police stops and arrests vary considerably by neighborhoods (Fagan and Davies, 2000; Fryer, 2019; Gelman, Fagan, and Kiss, 2007; Smith, 1986).
    - Fryer (2019) shows that population level black-white disparities in the stop rates declines from 4.23 to 1.43 after controlling for crime and arrest rates across police precincts in New York City
- Research on police use of deadly force and the association with place is limited and inconclusive

Police deployment, concentrated disadvantage, and crime

- Focusing police activity in the highest crime street segments make sense from a crime control perspective, given that crime is highly concentrated by location (Weisburd, 2006)

- Few studies examine how much population level racial disparities in arrests are associated with the concentration of disadvantage and crime

Aggregate Racial Disparities in Poverty

Table 1. Race/Ethnic Disparities in Percent Population Living in Poverty

Year	White	Black	Hispanic
2015	12.2%	25.4%	22.6%
2016	11.6%	23.9%	21%
2017	11.1%	23%	19.4%
2018	10.9%	22.5%	18.8%
2019	10.3%	21.2%	17.2%
Mean	11.22%	23.20%	19.80%

Source: American Community Survey, Census Bureau
https://data.census.gov/cedsci/table?q=poverty%20status&tid=ACS

- **Blacks and Hispanics are more likely than whites to live in poverty**

Aggregate Racial Disparities Victimizations

Table 2. Racial Disparities in Victimizations and Arrests for Robbery and Aggravated Assault, Average 2015-2019

Race/Ethnicity	Population	Robbery Victims	Robbery Arrests	Assault Victims	Assault Arrests
White	60.4%	47.3%	48.8%	59.5%	62.5%
Black	12.5%	18.8%	48.8%	13.3%	33.2%
Hispanic	18.3%	23.7%	23.1%	19.8%	24.9%

Sources: Bureau of Justice Statistics, NCVS Victimization Tool and FBI, Uniform Crime Reports, 2015-2019. Assaults represent aggravated felony assaults.

- **Blacks and Hispanics are slightly over represented relative to population in victims of robbery and assault**
- **Blacks and Hispanics are over represented relative to population in arrests for robbery and assault**

Table 3. Race or Ethnicity of Offenders in NCVS and Persons Arrested for Serious Violent Crime, 2018

Race/Ethnicity	Offenders in NCVS	Offenders in NCVS Reported to Police	UCR Arrests
White	43.8%	40.9%	38.7%
Black	35.9%	42.8 %	36.1%
Hispanic	15.5%	12.0%	21.4%

Race distribution of arrests closely mirrors distribution of reported offenders in national estimates of victimization

Does not inform our understanding of disparities in arrests for lower level offenses that have higher threshold of police discretion

Table 4. Firearm Homicide Offending, Victimization, and Police Shootings by Race

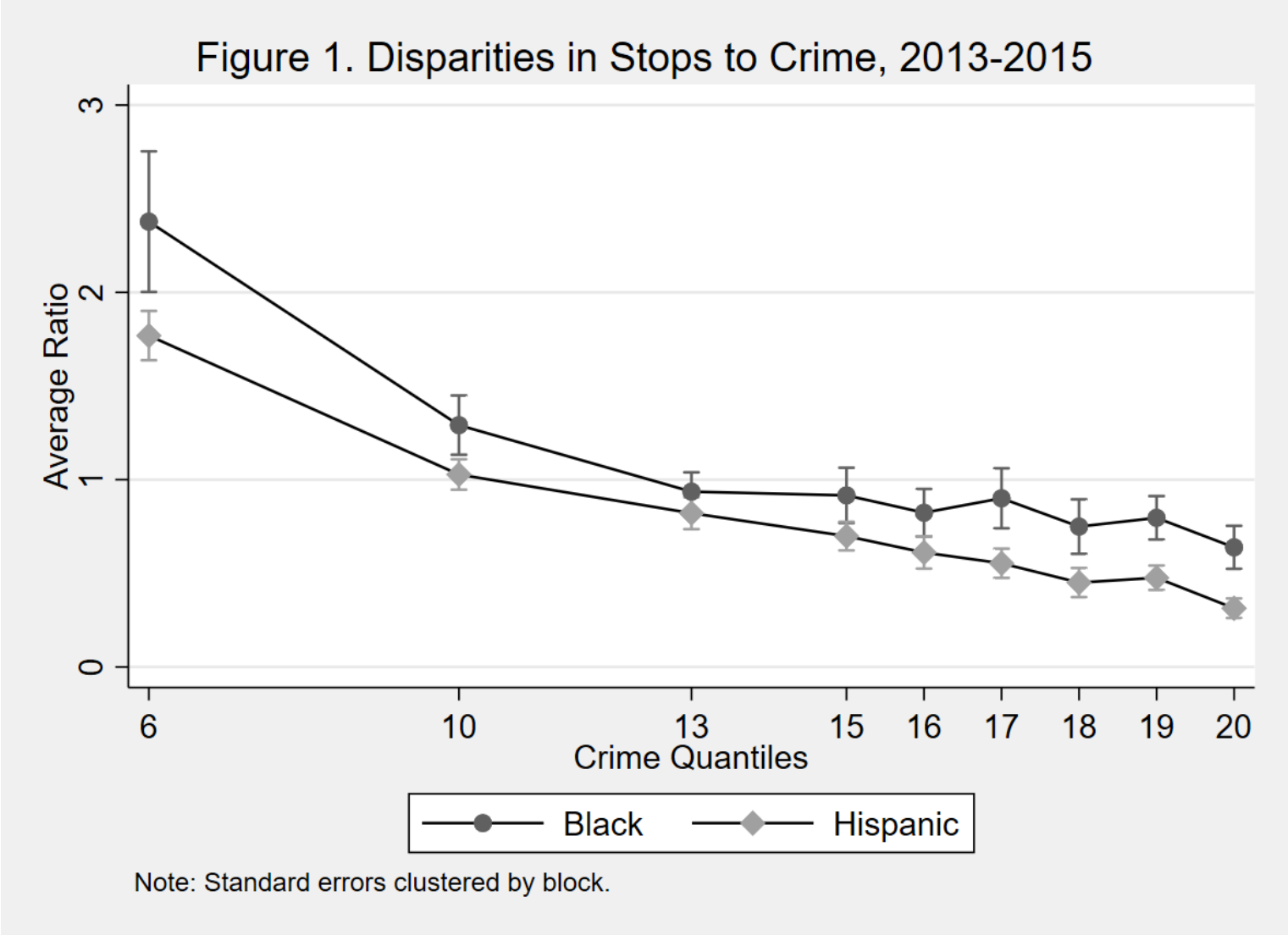
Year	Black homicide victims	White homicide victims	Black homicide offenders	White homicide offenders	Black police shootings	White police shootings
2015	16.69	1.76	12.95	1.28	0.63	0.28
2016	18.58	1.99	13.98	1.39	0.57	0.26
2017	17.99	1.97	14.22	1.41	0.54	0.27
2018	16.95	1.84	13.84	1.42	0.55	0.26
2019	17.63	1.77	14.38	1.38	0.60	0.25
Mean	17.57	1.87	13.87	1.38	0.58	0.26

Notes: Rates per 100,000 population. Data sources; https://github.com/washingtonpost/data-police-shootings https://www.ojjdp.gov/ojstatbb/ezashr/; https://data.census.gov/cedsci/table?d=ACS%201-Year%20Estimates%20Data%20Profiles&tid=ACSDP1Y2019.DP05

Disparities exist across gun homicide victims (9.3), offenders (10), and homicides by the police (2.2)

Data on police stops and arrests at the city and neighborhood level can inform a closer understanding of how much the population level racial disparities in enforcement activities are associated with the concentration of disadvantage and crime by area

RACIAL DISPARITIES IN POLICE STOPS IN NEW YORK CITY RELATIVE TO LEVEL OF CRIME BY BLOCK



CITY LEVEL RACIAL DISPARITIES IN ARRESTS: HOW MUCH IS ASSOCIATED WITH DIFFERENCES IN CONCENTRATED POVERTY?

- The data from 221 cities with complete data on crime and arrests for index offenses for blacks and whites for years 2014-2018 (Chalfin et al., 2020)
- American Community Survey (ACS) estimates of race-specific measures of concentrated disadvantage for each city
- Standardized composite scale (mean centered at zero) of the black or white percentage of the population living below poverty, the percentage of the population unemployed, and the median household income
- Population density, per capita public expenditures for each city, and region (Northeast, Midwest, South, West).

Table 6. Descriptive Data on 221 Large US Cities

	Mean	SD	Min	Max	N=
Index Arrests, Black	874.66	1512.98	10	15831	1066
Index Arrests, White	1057.35	1533.58	12	13900	1066
Population	272935.5	417433.5	48513	3862210	1066
Population Density	5055.53	5041.69	711.10	53015.42	1066
Percent White	48.60	21.37	2.24	90.05	1066
Percent Black	19.58	18.32	.28	87.12	1066
Percent Hispanic	21.81	19.68	1.48	95.58	1066
Percent White Unemployed	8.80	2.985	3.53	21.09	1066
Percent Black Unemployed	16.72	5.19	0	31.29	1066
Percent Hispanic Unemployed	11.63	4.44	2.28	26.5	1066
Median Household Income	34332.4	10510.4	17688	92048	1066
Percent White Poverty	17.09	6.17	5.26	38.92	1066
Percent Black Poverty	30.36	9.84	3.32	65.95	1066
Crime Rate	4374.90	1756.86	923.22	12910.73	1066
Per Capita Public Expenditures	3435.31	2028.08	745.54	17610.15	1055

EMPIRICAL MODEL ESTIMATING RACIAL DISPARITIES

- **A Poisson regression model estimates the arrests rate per city (i) for each group (j) (blacks or whites) per year (t), and includes the population of blacks or whites as exposure variable.**

$$\log\left(\frac{(\lambda_{it}^{j})}{Population_{it}^{j}}\right) = \beta_0 + \alpha_k \%Black_{it} + \mu_k \%Hispanic_{it} + \Upsilon Crime\ Rate_{it} + \theta_k Concentrated\ Disadvantage_{it}^{j} + \sigma Population\ Density_{it} + \pi Per\ Capita\ Expenditures_{it} + \eta_r + \delta_t$$

Table 7. City Level Index Arrest Rates for Black, 2014-2018.

	(1) Index Arrests Black	(2) Index Arrests, Black	(3) Index Arrests, Black
Quantiles % Black=2	0.723**	0.713**	0.726**
	(0.0746)	(0.0745)	(0.0793)
Quantiles % Black=3	0.633**	0.609**	0.615**
	(0.104)	(0.0981)	(0.102)
Quantiles % White=2	1.269*	1.395**	1.411**
	(0.122)	(0.132)	(0.134)
Quantiles % White=3	1.585*	1.750**	1.791**
	(0.320)	(0.295)	(0.306)
Quantiles % Hispanic=2	1.185	1.244	1.245
	(0.139)	(0.146)	(0.147)
Quantiles % Hispanic=3	1.002	1.063	1.097
	(0.166)	(0.164)	(0.171)
Expenditures per 1,000	1.000	1.000	1.000
	(0.0000182)	(0.0000185)	(0.0000194)
Population density	1.000	1.000	1.000
	(0.0000147)	(0.0000142)	(0.0000147)
Disadvantage, Black=2		1.046	1.024
		(0.0941)	(0.0912)
Disadvantage, Black=3		1.362**	1.315*
		(0.156)	(0.148)
Crime rate			1.000
			(0.0000201)
Observations	1055	1055	1055

Exponentiated coefficients (Incidence Rate Ratio); Standard errors in parentheses; Reference groups are 1st (0-33 percentile) for Quantiles, 2014 for year, and Northeast for region. Concentrated Disadvantage represents average of percentage of blacks in poverty, percentage of unemployed, and median household income.

* $p < .05$, ** $p < 0.01$

Black arrest rate is 31.5% higher in most disadvantaged tertile after controlling for year, region, crime rate and other covariates

Table 8. City Level Index Arrest Rate for White, 2014-2018.

	(1) Index arrests, White	(2) Index arrests, White	(3) Index arrests, White
Quantiles % Black=2	0.787*	0.768**	0.778**
	(0.0750)	(0.0690)	(0.0736)
Quantiles % Black=3	0.671**	0.637**	0.627**
	(0.0951)	(0.0873)	(0.0865)
Quantiles % White=2	0.732**	0.837*	0.818*
	(0.0803)	(0.0710)	(0.0688)
Quantiles % White=3	0.784	0.875	0.863
	(0.112)	(0.114)	(0.114)
Quantiles % Hispanic=2	1.225*	1.197	1.215
	(0.125)	(0.121)	(0.124)
Quantiles % Hispanic=3	1.517**	1.430**	1.506**
	(0.204)	(0.197)	(0.208)
Expenditures per 1,000	1.000	1.000	1.000
	(0.0000263)	(0.0000256)	(0.0000258)
Population density	1.000*	1.000	1.000
	(0.0000183)	(0.0000183)	(0.0000182)
	(0.122)	(0.140)	(0.143)
Disadvantage, White=2		1.259**	1.181*
		(0.109)	(0.0960)
Disadvantage, White=3		1.668**	1.548**
		(0.186)	(0.180)
Crime rate			1.000*
			(0.0000254)
	1055	1055	1055

Exponentiated coefficients (Incidence Rate Ratio); Standard errors in parentheses; Reference groups are 1st (0-33 percentile) for quantiles, 2014 for year, and Northeast for region. Concentrated Disadvantage represents average of percentage of whites living below poverty, percentage unemployed, and median household income.

* $p < .05$, ** $p < 0.01$

White arrest rate is 54.8% higher in most disadvantaged tertile after controlling for year, region, crime rate and other covariates

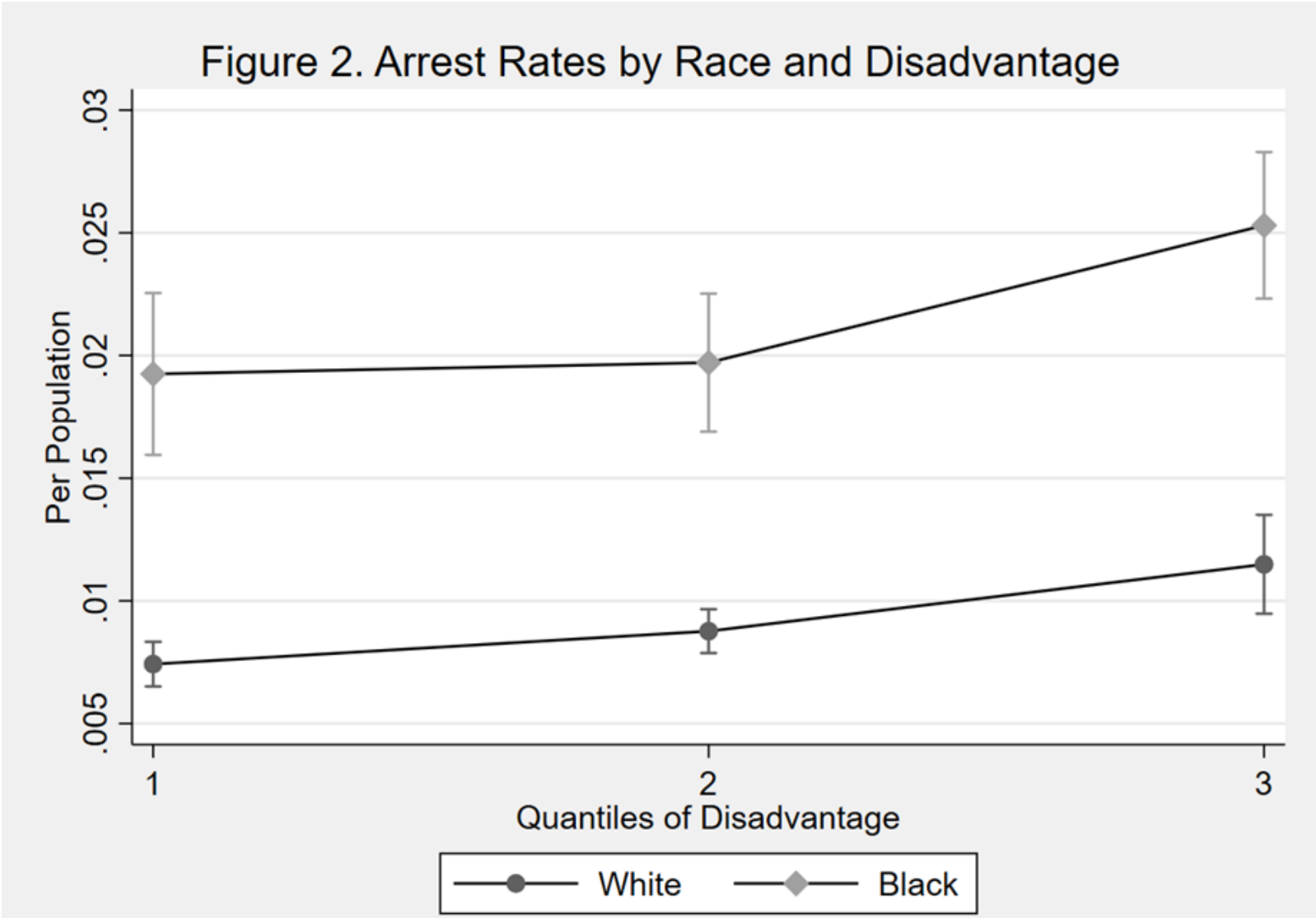


Figure 2. Arrest Rates by Race and Disadvantage
Per Population
.005
.01
.015
.02
.025
.03
1
2
3
Quantiles of Disadvantage
White
Black

There are no large US cities where on average blacks and whites live in comparable levels of poverty and unemployment

- For cities that rank in the top 66-100% of white concentrated disadvantaged
  - White: Unemployment 11.59%; Poverty 23.4%
  - Black: Unemployment 19.74%; Poverty 34%

- Detroit, MI and Camden, NJ are the exception with comparable levels of poverty by race. (Less than 10% of the population is white).

How much of the variation in racial disparities in arrest rates is attributable to variation in economic disadvantage and levels of crime at a more micro level?

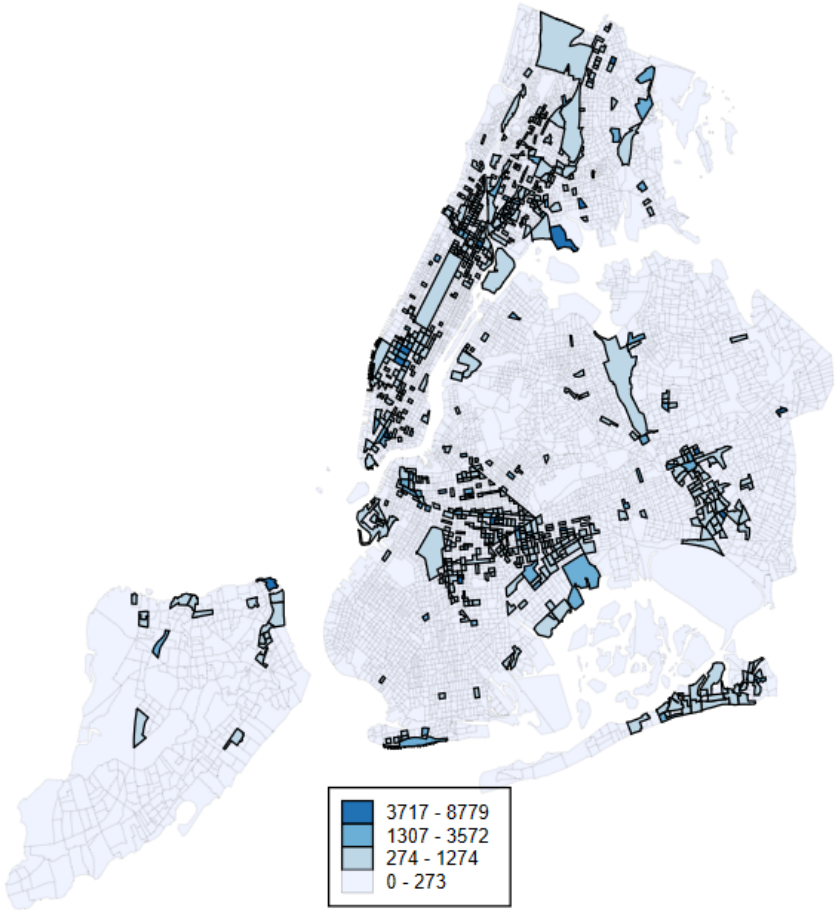
- Examination of New York City, Chicago, and Los Angeles arrest, crime, and concentrated disadvantage measures at census block level 2014-2019
- Arrests and crime linked to corresponding locations (monthly) at the census block group level
- ACS measures of the residential population to capture concentrated disadvantage
  - % pop under 18, % female headed households, % families in poverty, median household income, and % vacant houses

Racial Disparities in Arrests per Population

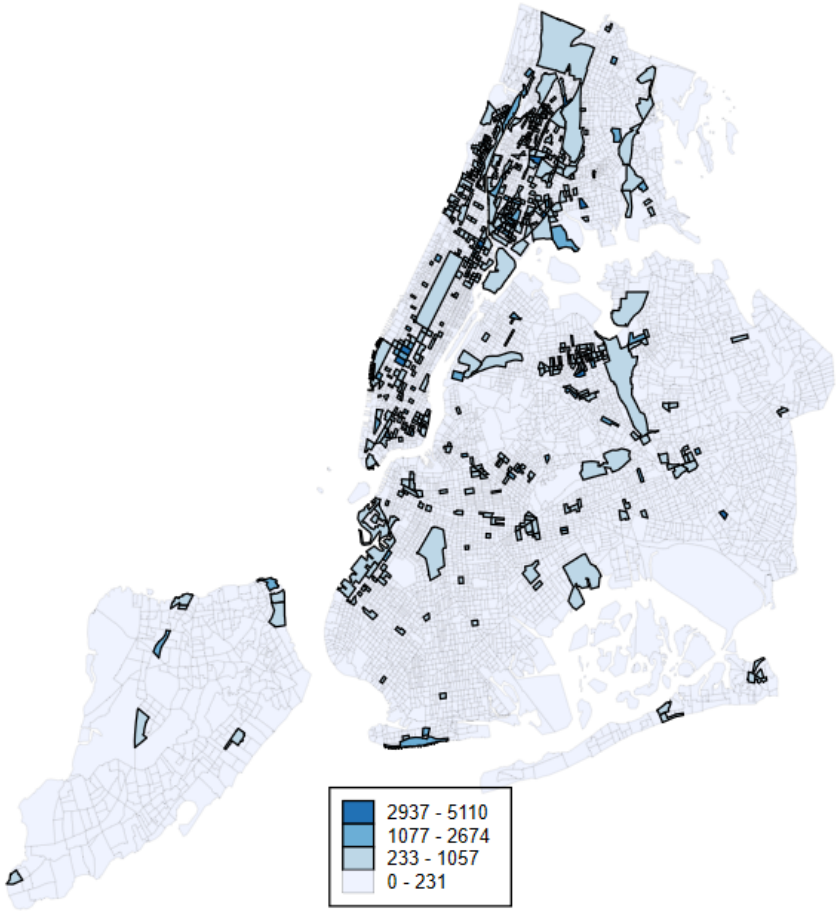
- New York City
  - Black: 48% of arrests; 24% of population
  - Hispanic: 34% of arrests; 28% of population
- Chicago
  - Black: 74% of arrests; 35% of the population
  - Hispanic: 17% of arrests; 26% of the population
- Los Angeles
  - Black: 29% of arrests; 10% of the population
  - Hispanic: 46% of arrests; 46% of population

Disparities though cluster by location

Black Arrests, 2014-2019

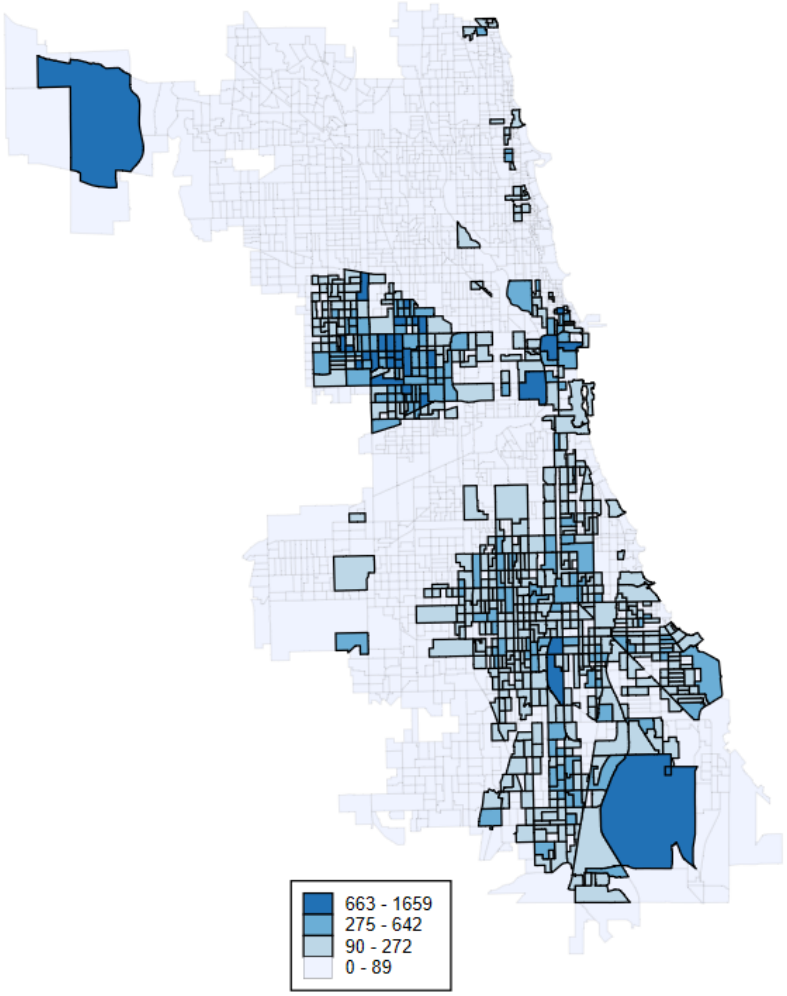


Hispanic Arrests, 2014-2019

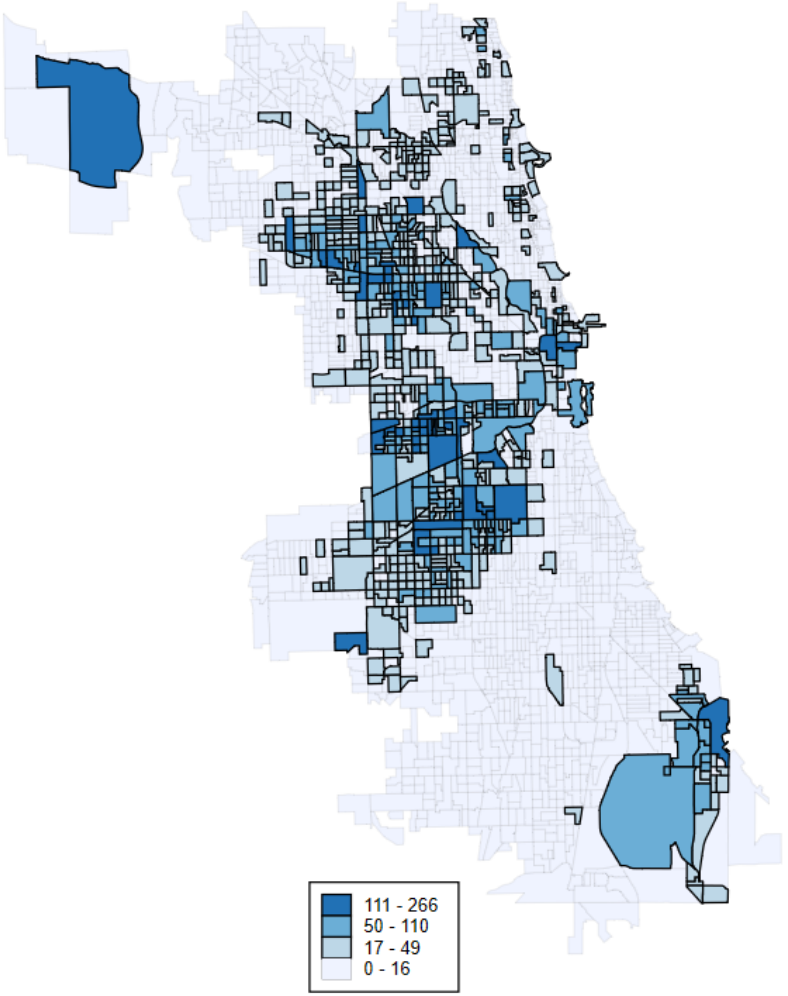


Source: Open NYC Data

Black Arrests, 2014-2019

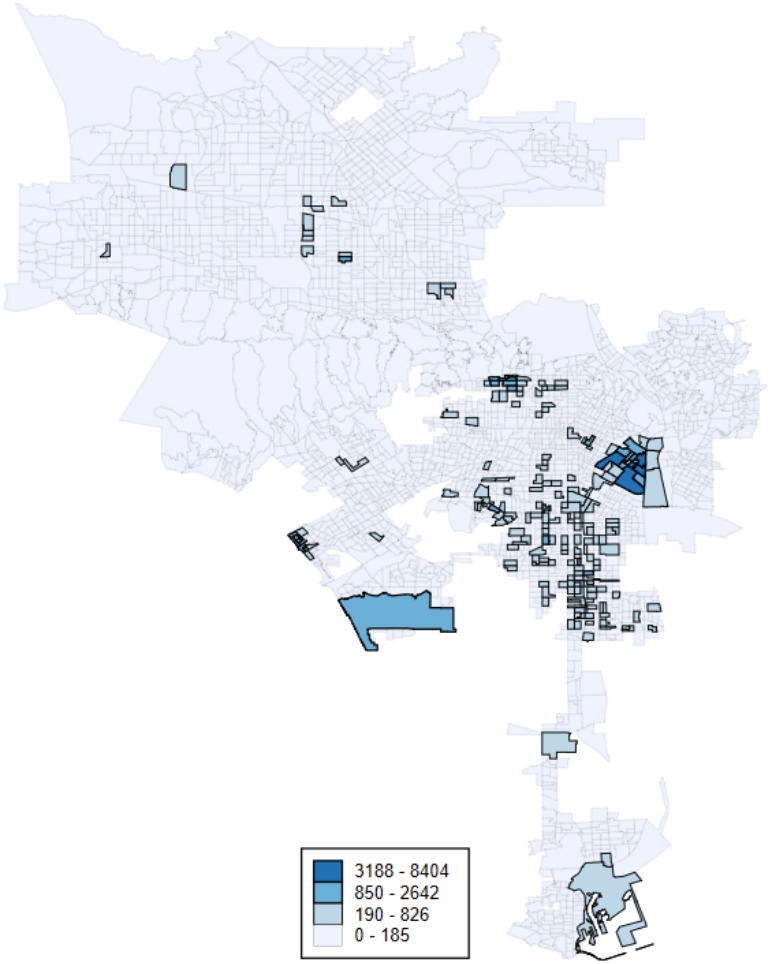


Hispanic Arrests, 2014-2019

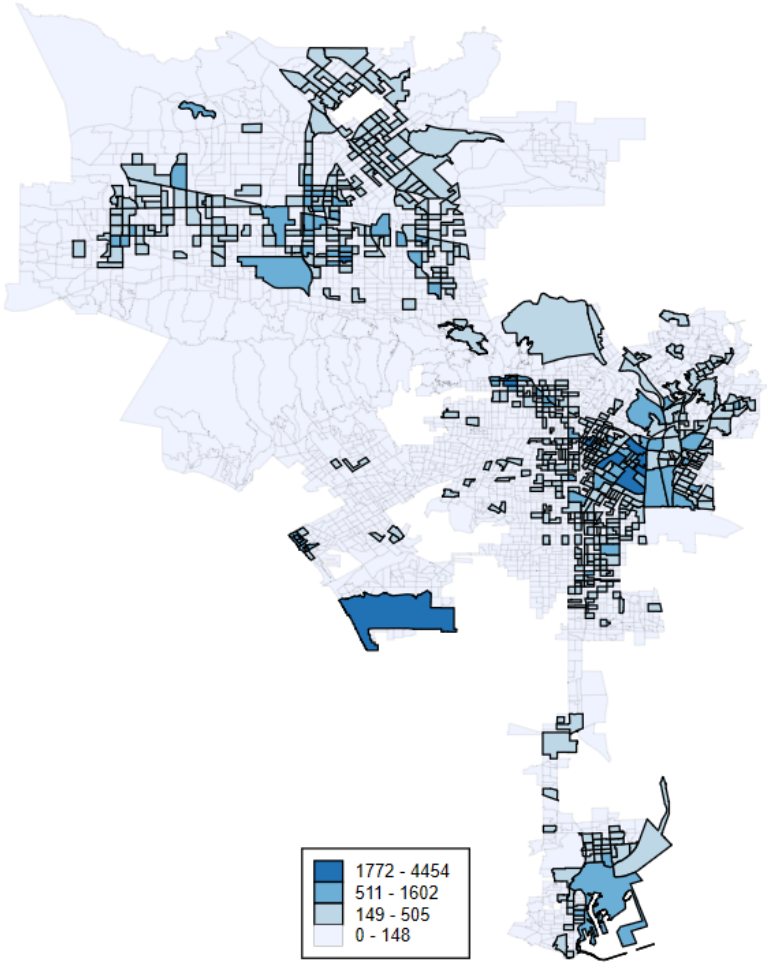


Source: Open Chicago Data

Black Arrests, 2014-2019



Hispanic Arrests, 2014-2019



Source: Los Angeles Open Data

EMPIRICAL MODEL ESTIMATING RACIAL DISPARITIES

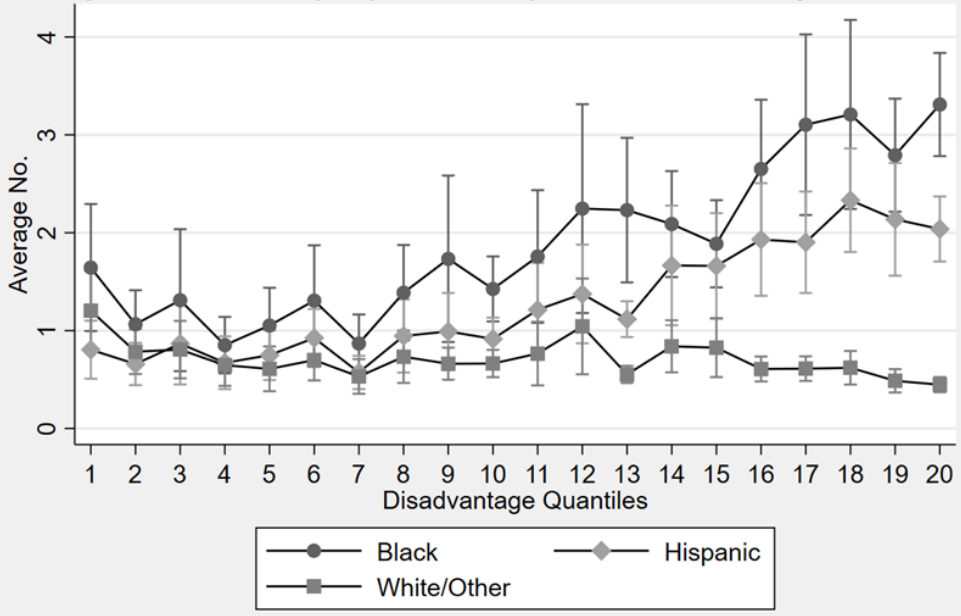
- **A Poisson regression model estimates the arrests rate (per block group i) per month (m) for each group (j) (blacks, Hispanics, or white/others)**

$$\log\left(\lambda_{imt}^{j}\right) = \beta_0 + \theta Concentrated\ Disadvantage_{imt} + \Upsilon Crime\ Rate_{imt} + \eta_r + \delta_t$$

- **For New York City, Chicago, and Los Angeles regions (r) are defined by the Borough, Ward, or LAPD Division in which the census block group is located**
- **Crime rate measured by counts per block group overall and by race/ethnicity of reporting victims**

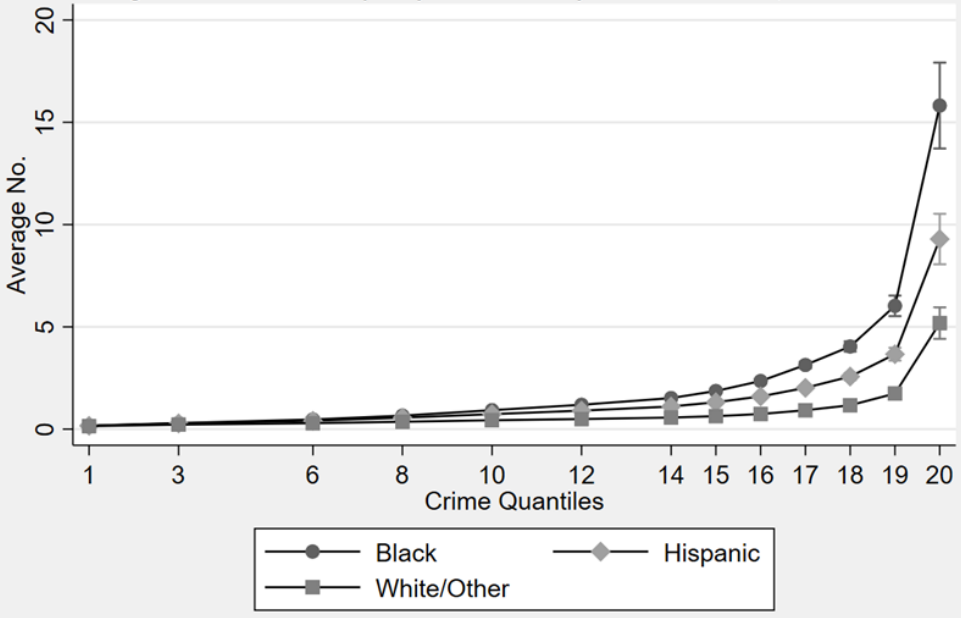
New York	Black	Black	Black	Black	Black
Disadvantage			1.192**	1.226**	1.052**
			(0.00334)	(0.0228)	(0.0163)
Criminal Offenses				1.030**	
				(0.00308)	
Black victims					1.199**
					(0.00578)
Average rate	**2.050**	**1.904**	**1.805**	**1.630**	**1.462**
Observations	417427	417390	387188	381527	381527
	Hispanic	Hispanic	Hispanic	Hispanic	Hispanic
Disadvantage			1.216**	1.241**	1.094**
			(0.00305)	(0.0221)	(0.0195)
Criminal offenses				1.029**	
				(0.00301)	
Hispanic victims					1.197**
					(0.0115)
Average rate	**1.455**	**1.273**	**1.198**	**1.098**	**1.070**
	417427	417390	387188	381527	381527
	White/Other	White/Other	White/Other	White/Other	White/Other
Disadvantage			0.925**	0.941**	0.963
			(0.00296)	(0.0188)	(0.0192)
Crime offenses				1.027**	
				(0.00296)	
White/other victims					1.030**
					(0.00359)
Average rate	**0.782**	**0.696**	**0.699**	**0.657**	**0.667**
Observations	417427	417390	387188	381527	381527
Year fixed effects	No	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes	Yes

Figure 4a. Racial Disparity in Arrests by Level of Disadvantage, NYC



Note: Standard errors clustered by block group.

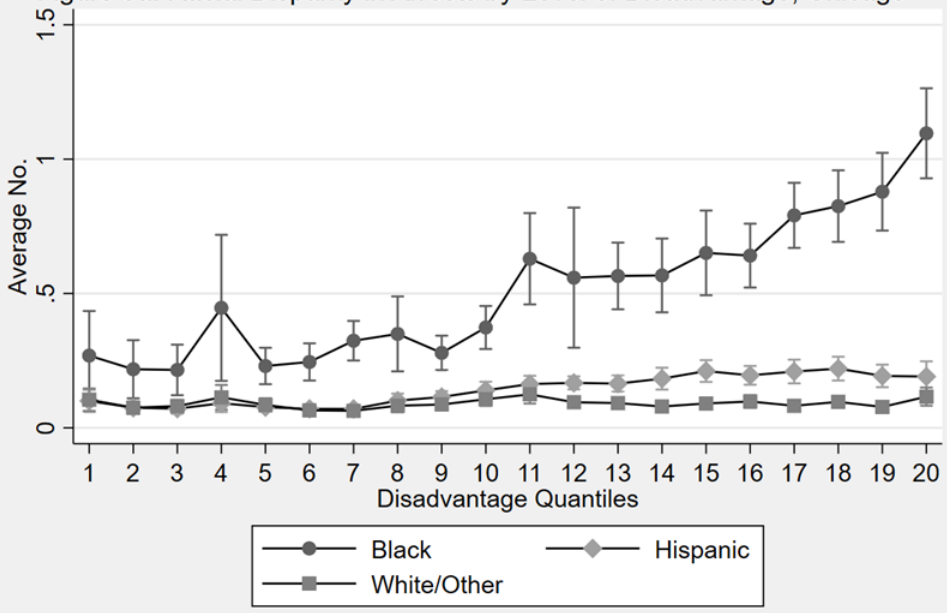
Figure 4b. Racial Disparity in Arrests by Level of Crime, NYC



Note: Standard errors clustered by block group.

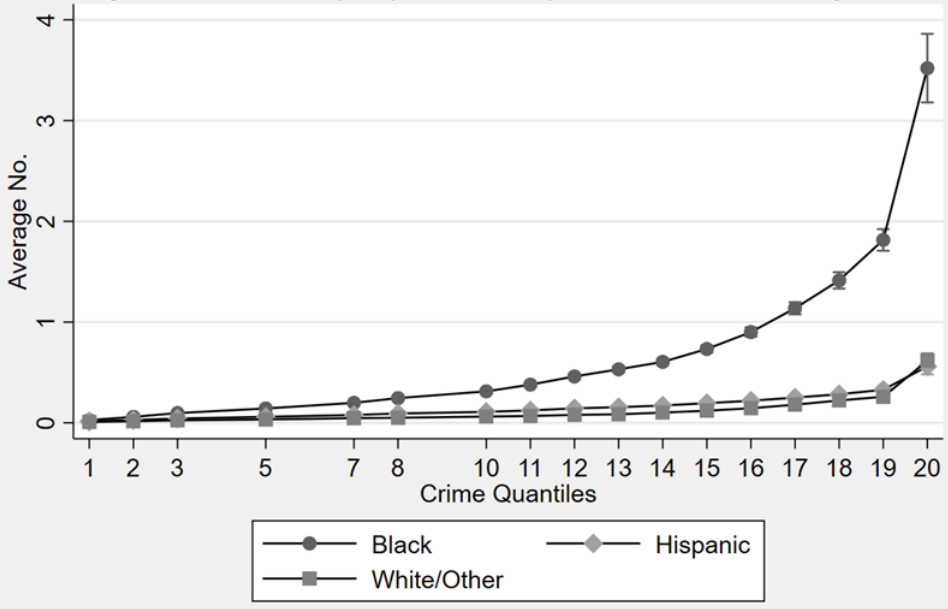
Chicago	Black	Black	Black	Black
Disadvantage			1.253**	1.213**
			(0.0241)	(0.0201)
Criminal Offenses				1.016**
				(0.00252)
Average rate	**1.201**	**0.512**	**0.460**	**0.448**
Observations	154604	154595	147277	147277
	Hispanic	Hispanic	Hispanic	Hispanic
Disadvantage			1.188**	1.160**
			(0.0257)	(0.0234)
Criminal offenses				1.015**
				(0.00241)
Average rate	**0.264**	**0.133**	**0.132**	**0.129**
Observations	154604	154595	147277	147277
	White/Other	White/Other	White/Other	White/Other
Disadvantage			1.009	0.979
			(0.0266)	(0.0224)
Crime offenses				1.013**
				(0.00208)
Average rate	**0.157**	**0.0905**	**0.0906**	**0.0894**
Observations	154604	154595	147277	147277
Year fixed effects	No	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes

Figure 5a. Racial Disparity in Arrests by Level of Disadvantage, Chicago



Note: Standard errors clustered by block group.

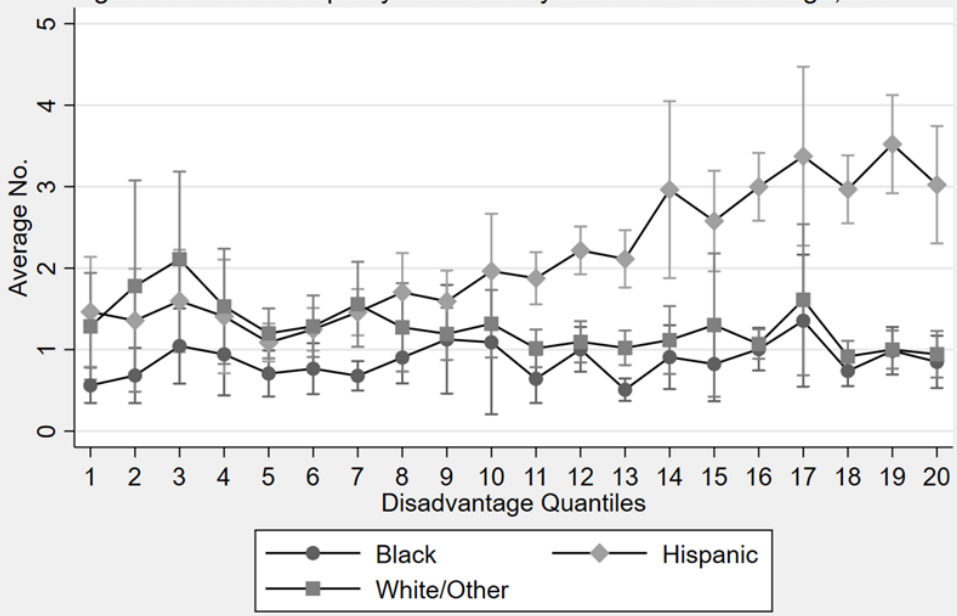
Figure 5b. Racial Disparity in Arrests by Level of Crime, Chicago



Note: Standard errors clustered by block group.

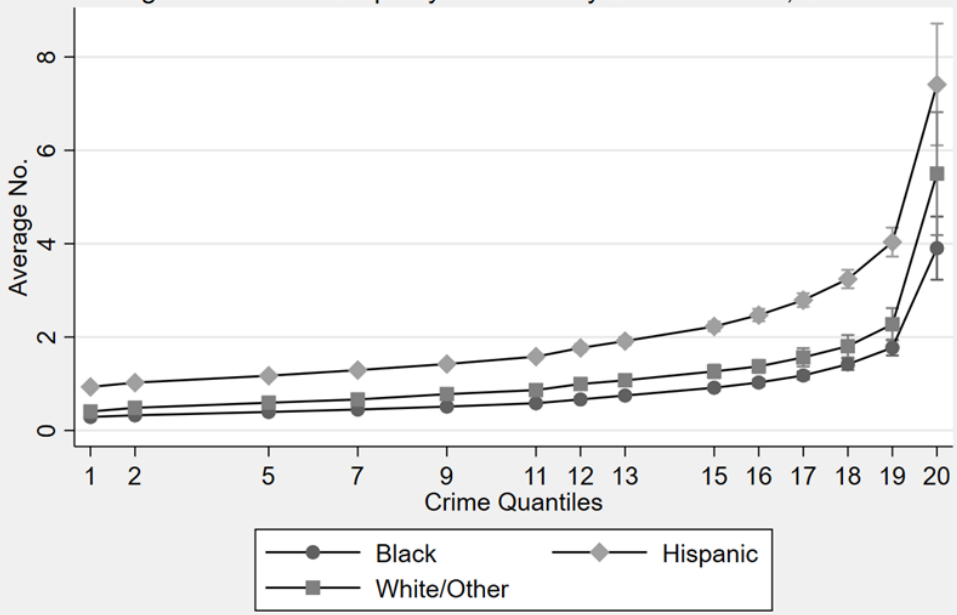
Los Angeles	Black	Black	Black	Black	Black
Disadvantage			1.056	1.120	1.068
			(0.0635)	(0.0659)	(0.0486)
Criminal Offenses				1.016**	
				(0.00384)	
Black victims					1.082**
					(0.0140)
Average rate	**1.550**	**0.911**	**0.874**	**0.866**	**0.865**
Observations	127701	127701	123865	121328	121328
	Hispanic	Hispanic	Hispanic	Hispanic	Hispanic
Disadvantage			1.198**	1.236**	1.204**
			(0.0346)	(0.0299)	(0.0299)
Criminal offenses				1.019**	
				(0.00365)	
Hispanic victims					1.055**
					(0.0100)
Average rate	**2.488**	**2.200**	**2.119**	**2.077**	**2.072**
Observations	127701	127701	123865	121328	121328
	White/Other	White/Other	White/Other	White/Other	White/Other
Disadvantage			0.929	0.955	0.976
			(0.0416)	(0.0397)	(0.0380)
Crime offenses				1.020**	
				(0.00385)	
White/other victims					1.040**
					(0.00587)
Average rate	**1.314**	**0.855**	**0.840**	**0.826**	**0.820**
Observations	127701	127701	123865	121328	121328
Year fixed effects	No	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes	Yes

Figure 6a. Racial Disparity in Arrests by Level of Disadvantage, LA



Note: Standard errors clustered by block group.

Figure 6b. Racial Disparity in Arrests by Level of Crime, LA



Note: Standard errors clustered by block group.

Population level disparities could be reduced significantly by focusing on highest crime places

- Moving the 95th percentile of highest crime places to the median would cut population level disparities for black arrest rates by
  - 30% in New York (2.05 to 1.43)
  - 25% in Chicago (1.20 to .894)
  - 29% in Los Angeles (1.55 to 1.10)

Conclusions

Focus police and public safety efforts on problem solving activities in the crime "hot spots" of disadvantaged communities could potentially reduce population level racial disparities in arrests

Braga and Weisburd (2010) note, the issue of addressing community problems is especially important in "minority neighborhoods where residents have long suffered from elevated crime problems and historically poor police service."

Situational crime prevention strategies that focus on *changing the structural aspects of places* that generate crime, from cleaning up vacant lots to installing better street lights, help reduce serious crime in areas without displacing it nearby or generating additional arrests (Braga and Bond, 2008; Branas et al., 2018; Chalfin et al., 2021; MacDonald et al., 2021).