



Concentrated incarceration and the public-housing-to-prison pipeline in New York City neighborhoods

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Using public housing developments as a strategic site, our research documents a distinct pathway linking disadvantaged context to incarceration—the public-housing-to-prison pipeline. Focusing on New York City Housing Authority (NYCHA) housing developments as a case study, we find that incarceration rates in NYCHA tracts are 4.6 times higher than those in non-NYCHA tracts. More strikingly, 94% of NYCHA tracts report rates above the median value for non-NYCHA tracts. Moreover, 17% of New York State’s incarcerated population originated from just 372 NYCHA tracts. Compared with non-NYCHA tracts, NYCHA tracts had higher shares of Black residents and were significantly more disadvantaged. This NYCHA disadvantage in concentrated incarceration is also robust at different spatial scales. Our findings have implications for policies and programs to disrupt community-based pipelines to prison.

concentrated incarceration | public-housing-to-prison pipeline | hypersurveillance

Compared with all other countries, the United States reports the highest incarceration rate, accounting for one in five of the 11 million people incarcerated worldwide in 2019 (1). From 1980 to 2019, the incarceration rate per 100,000 US residents more than tripled from 131 to 419, reaching a peak at 506 in 2008 (2). This drastic surge in incarceration has disproportionately impacted young Black and Hispanic males with devastating consequences for their families and communities (3, 4). In particular, Black males ages 18 to 19 y were 12.4 times more likely to be incarcerated than their White male counterparts in 2019 (2).

The US carceral system is the largest in the world (5). In 2019, before the pandemic, 6.5 million adults lived under correctional control (6). Among them, 2.1 million were incarcerated and 4.4 million were on probation and parole (7, 8). If the incarcerated were to populate a city, it would be the fifth-largest in the United States, behind New York, Los Angeles, Chicago, and Houston. In 2019, 31 million youths were under the jurisdiction of juvenile courts in 2019 (8). Moreover, jail incarceration is rather common, with an estimated annual admission of 10.3 million (9, 10).

The collateral consequences of incarceration are wide-ranging. In 2016, 19 million had a felony conviction, 77 million had a criminal record, and 113 million have had immediate family behind bars (11). Specifically, the prevalence of incarceration of an immediate family member is highest among Blacks (63%), but it is also common among Whites (42%) and Hispanics (48%) (12). Although the COVID-19 pandemic led to a decline in the incarcerated population, the US carceral system remains exceptionally punitive in scope and scale, incarcerating more individuals for longer durations than any other countries with similar rates of violent crimes (1, 13, 14).

Mass incarceration is spatially concentrated in the most disadvantaged, segregated Black neighborhoods in US cities, with a number of minority communities accounting for majority of incarcerated individuals (15, 16). A legacy of racial residential segregation, mass incarceration is a consequence of the “spatial organization of social control” of disadvantaged communities with significantly higher rates of arrests, convictions, and surveillance (16, 17). In the 1990s, Eddie Ellis—a formerly incarcerated scholar—documented that “75 percent of the state’s entire prison population comes from just seven neighborhoods in New York City” (18). This concentration is exemplified by “million-dollar blocks”—census blocks for which the cost of imprisoning their residents was upward of \$1 million (19, 20). For example, 31 men from four blocks in Brownsville, Brooklyn accounted for \$4.4 million in imprisonment cost in 2003 (19). Once limited to cities, these “prison places”—communities with very high levels of concentrated incarceration—have recently spread to small cities as well as suburban and non-metropolitan counties (16, 21).

Research on the carceral system has revealed diverse pathways linking disadvantaged neighborhoods to mass incarceration, including the “school-to-prison” pipeline and “community-to-prison” pipeline (17, 22, 23). We advance this research by identifying

Significance

Research on mass incarceration has documented its devastating consequences on incarcerated individuals, their families, and minority communities. This study examines the increased risk of incarceration in New York City Housing Authority neighborhoods. That incarceration is disproportionately concentrated in disadvantaged and segregated Black neighborhoods is well documented. This analysis examines public housing developments as a primary site of spatially clustered incarceration or concentrated incarceration. This study contributes to research on punishment and inequality by highlighting the public-housing-to-prison pipeline as a missing link in the carceral system.

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a distinct pathway—the “public-housing-to-prison” pipeline—by highlighting New York City Housing Authority (NYCHA) developments as the epicenters of concentrated incarceration. Hypersurveillance and hyperpolicing in NYCHA developments are key mechanisms underlying this public-housing-to-prison pipeline. While focusing on New York City, the mechanisms we identified are applicable to public housing developments in other US cities. More generally, public housing developments are an integral part of the carceral system linking disadvantaged neighborhoods, public schools, and the prison system.

In this paper, we use “public housing developments” instead of “public housing projects” because the latter term can be stigmatizing with negative connotations. In New York City, public housing is often referred to as “NYCHA developments.”

The Public-Housing-to-Prison Pipeline

This study connects three strands of research—neighborhood effects, mass incarceration, and public housing—to examine how public housing developments shape concentrated incarceration in New York City. Although neighborhood effects research has amply documented the detrimental impacts of growing up and living in disadvantaged neighborhoods, including much higher risks of incarceration (24, 25), the role of public housing developments in concentrated incarceration has not been explored. Although research on the consequences of mass incarceration has drawn attention to the concentration of incarceration in specific blocks or neighborhoods (19, 21), how public housing developments intensify such spatial clustering remains unexamined. Despite the geographic overlap between public housing developments and disadvantaged neighborhoods in cities from Baltimore to New York, housing research on the urban poor has mostly focused on housing decisions, not the connection between proximity to public housing developments and propensity for incarceration (26).

We use public housing as a strategic research site to examine incarcerated concentration. First, public housing is disproportionately concentrated in disadvantaged neighborhoods (27, 28). Second, public housing has been associated with higher crime rates, including homicide and robberies within or in the immediate vicinity of such housing developments from Los Angeles to Philadelphia (29, 30). Whether public housing developments serve as hotbeds of, magnets for, or generators of violence is an open empirical question with studies showing support for these three perspectives, depending on the time periods, spatial levels of aggregation, and specific cities (29). Third, public housing is correlated with higher levels of youth delinquency (31), higher levels of social disorder (32), higher levels of police surveillance (33, 34), and lower levels of social trust (35).

Established in 1935, NYCHA was the first and largest public housing agency in North America. NYCHA’s mission is to provide affordable housing to low- and moderate-income individuals. In 2020, NYCHA managed 2,252 residential buildings in 302 developments with 169,820 rental apartments, accounting for 11.6% of the city’s rentals (36). In 2020, 1 in 15 New Yorkers lived in NYCHA housing, with average family income of \$25,602 and average rent of \$548 (36). In contrast to popular stereotypes on the failures of public housing invoked by well-publicized developments such as Pruitt-Igoe in St. Louis and Cabrini-Green in Chicago (32, 37), NYCHA has remained critical to the city’s affordable housing stock, despite drastic declines in federal and state funding since 1998 (38). Unlike Chicago, there were no major policy efforts to deconcentrate

poverty, diversify the income mix, or demolish public housing developments in New York City (39).

Research on the carceral system has examined pathways linking disadvantaged context to incarceration, including school-to-prison, poverty-to-prison, cradle-to-prison, and community-to-prison pipelines (17, 22, 23, 40, 41). Our research documents the public-housing-to-prison pipeline. Historically, public housing has been a policed site of social and spatial control (42). Hyperpolicing and hypersurveillance of NYCHA residents, developments, and neighborhoods are two mechanisms behind this pipeline. As key institutions in the urban governance of poverty, NYCHA and New York City Police Department (NYPD) have a long collaborative relationship to maintain social order and reduce crimes around NYCHA developments to improve the quality of life for residents. One unintended consequence of such collaborations, however, is the hyperpolicing and the hypersurveillance of public housing residents within and beyond NYCHA developments, with potentially lethal consequences for Black and Hispanic NYCHA residents including emotional trauma, social isolation, physical injuries, displacement, and death (43).

Federal guidelines from US Department of Housing and Urban Development (HUD) further incentivized the relationship between public housing authorities (PHAs) and police departments (44). Since its inception, NYCHA developments are the only developments in New York City to have their own city-run police department (45, 46). Prior to 1994, a special police force known as the Housing Authority Police Department (HAPD) was charged with maintaining safety and security for NYCHA developments. Since 1994, HAPD merged with NYPD to form the NYPD Housing Bureau. NYCHA must compensate NYPD for patrolling public housing developments, making NYCHA the only residential landlord required to pay for police protection in the city. In essence, “residents are essentially charged twice for policing services—once through local taxes like all other New Yorkers and once through the reimbursement required of their landlord” (47). Despite NYCHA’s declining operating budgets and an estimated \$1 billion in necessary capital improvements for its 344 housing developments, these payments increased from \$58 million in 1994 to over \$70 million in 2013, before the then-mayor Bill DeBlasio terminated the practice (48).

A first mechanism behind the hypersurveillance of NYCHA residents, developments, and neighborhoods is the police-to-public-housing pipeline of information—a result of long-standing practices and collaborations between NYCHA and NYPD (46). Since 1996, the Memorandum of Understanding on Disclosure of Arrest and Complaint Information by NYPD to NYCHA requires NYPD to notify NYCHA any time a NYCHA address is used in a police investigation such as an arrest (49). Such notifications occur regardless of whether the person is a NYCHA resident or connected to a NYCHA household, and independent of whether the arrest or incident takes place within or beyond a NYCHA development. If the person arrested provides a NYCHA home address, that address would come under investigation with NYCHA given the agency’s “statutory responsibility to terminate tenancies” of those tenants who might threaten the safety of other public housing tenants (49).

A second mechanism behind hypersurveillance is hyperpolicing of NYCHA housing developments and neighborhoods (42, 46, 50). Many routine policing tactics aimed at NYCHA developments can have disproportionate impacts on residents’ perceptions of safety and security. These tactics include vertical patrols, stop and frisk, zero-tolerance policing, nuisance ordinance, and surveillance technologies (51). Some of these tactics (e.g., vertical patrols) specifically target NYCHA buildings. Others

target low-income minority neighborhoods (e.g., broken windows), with outsized impact on NYCHA residents. Many of these tactics are unconstitutional (50–52). For example, NYCHA residents and visitors filed a class-action lawsuit against NYCHA and the City of New York—*Davis vs. City of New York* (2010), confronting NYPD’s practices regarding the unlawful stops and arrests of NYCHA residents and their visitors for criminal trespassing without any evidence beyond their ethnicity (53). In a second example, *Floyd vs. City of New York* (2008) challenged NYPD’s stop-and-frisk practices as a method of racially profiling and harassing minority residents in low-income neighborhoods, including NYCHA tracts (54).

A third mechanism behind hypersurveillance is the increasing reliance on technology to monitor public housing developments (42, 55–57). Although security cameras are ubiquitous in NYCHA developments, the number of cameras almost doubled from 6,131 to 11,035 from 2012 to 2014 (58). By October 2014, 49% of NYCHA developments and 42% of NYCHA buildings were equipped with closed-circuit television cameras (58). NYCHA developments accounted for 41% of public security cameras—7,000 among 17,000—that NYPD had access to (33). In 2014, NYCHA and NYPD implemented Omnipresence—a policing strategy relying on an enhanced system of surveillance technology—at 15 low-income NYCHA developments (33, 59). Under Omnipresence, surveillance of NYCHA developments intensified with bright spotlights flooded the grounds throughout the night, while mobile police tower units hovered above (60). With the rise of big data and artificial intelligence, police departments adopted facial recognition systems, video analytics, social media monitoring, and predictive policing—tactics that disproportionately impacted

residents in low-income housing developments and neighborhoods (42, 55–57, 61). Because of this hypersurveillance, NYCHA residents have more interactions with the police simply for being residents and police encounters are often negative for NYCHA residents (62).

Research Design

This study combines census and geocoded administrative data from New York City to document the association between concentrated incarceration and the presence of public housing. The study uses the census tract (average population of 4,000 to 8,000) as the unit of analysis and as a proxy for neighborhoods. We analyze tract-level data from 2,095 census tracts in the year 2010. The dependent variable is tract-level incarceration rate per 100,000 residents in 2010. The main independent variable is whether a given census tract has at least one public housing development (1 = Yes; 0 = No). We refer to tracts with NYCHA developments as “NYCHA tracts” or “NYCHA neighborhoods.” In a few cases, NYCHA developments occupy the majority or entirety of the tract ($n = 60$). In most cases, a NYCHA tract includes both NYCHA and non-NYCHA housing (e.g., apartment buildings or multifamily houses). We use a series of spatial regressions to model the association between the presence of NYCHA housing in a census tract and incarceration rate, controlling for neighborhood-level covariates (for details see *SI Appendix*).

Results

Fig. 1 maps the spatial relationship between NYCHA developments and incarceration rates. Incarceration is spatially concentrated, with NYCHA neighborhoods reporting the highest rates.

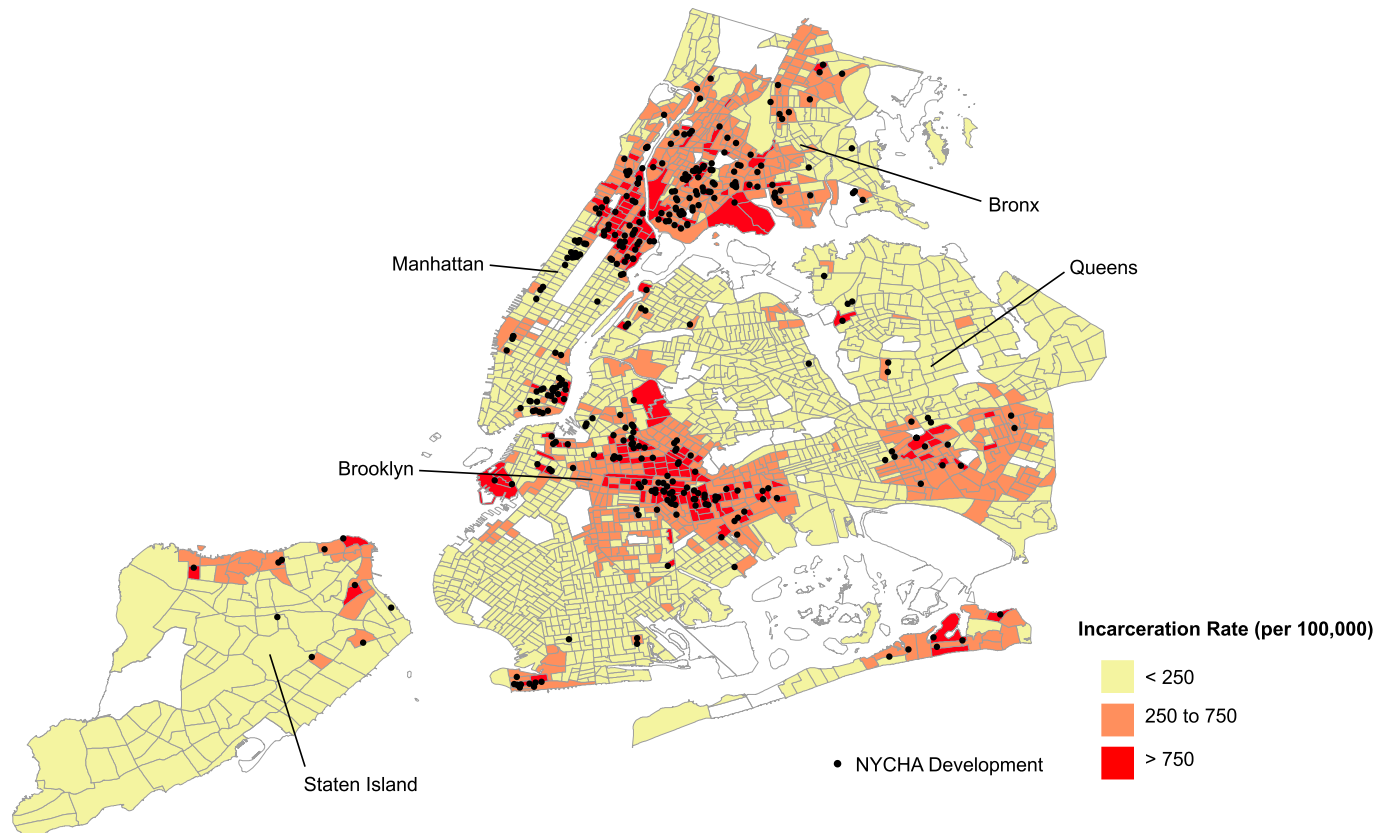


Fig. 1. NYCHA housing developments and concentrated incarceration by census tract in New York City in 2010. Incarceration rate is the number of incarcerated individuals per 100,000 in a census tract. The colors represent three categories based on Jenks natural breaks algorithm in the distribution of incarceration rates across all tracts (see *SI Appendix*, Fig. S1).

Incarceration rates in NYCHA tracts are 4.6 times higher than those in non-NYCHA tracts (541 and 117, respectively). Compared with non-NYCHA tracts, incarceration rates in NYCHA tracts are 5.9 times higher in Manhattan and 6.5 times higher in Brooklyn. More strikingly, 94% of NYCHA tracts display incarceration rates above the median value for non-NYCHA tracts. These findings point to a strong association between incarceration and public housing residence, highlighting one distinctive aspect of the lived experiences in NYCHA neighborhoods.

In 2010, half of all incarcerated people in New York State prisons were residents of New York City prior to incarceration. Among them, 35% resided in census tracts with public housing developments, even though such tracts accounted for only 15% of New York City's population. More generally, 17% of the incarcerated population in New York State originated from only 372 tracts in New York City with public housing developments, even though these tracts accounted for only 6.3% of New York State's population.

Table 1 compares NYCHA and non-NYCHA tracts by key neighborhood characteristics. In the last column, the NYCHA/non-NYCHA ratio provides a summary of the differences, with higher ratios indicating greater disparities. Despite the difference in incarceration rates, NYCHA and non-NYCHA tracts are similar in population size and in share of young residents. In NYCHA tracts, however, the average Black population is five times higher, and the level of disadvantage is two times higher. Importantly, crime rates in NYCHA and non-NYCHA tracts are similar, suggesting excess crime cannot account for concentrated incarceration in NYCHA tracts. By contrast, NYCHA tracts report significantly higher rates of stop-and-frisk encounters, lending support for the presence of excessive surveillance of NYCHA developments.

To learn more about the relationship between neighborhood characteristics—including the presence or absence of NYCHA developments—and incarceration rates, we constructed a series of nested linear models to account for the spatial clustering of census tracts (regression results are in *SI Appendix, Table S1*). Our spatial regression analysis illuminates a significant positive relationship between NYCHA housing and incarceration rates, even when accounting for key social and economic variables, crime rates, and police surveillance. A model that only considers whether a NYCHA development is present in a census tract, the share of tract residents that live in NYCHA housing, and the map of census tracts (Model 1) can account for more than 67% of the variation in incarceration rates at the tract level. Importantly, a model that considers a host of social and economic variables but does not consider crime rates or police surveillance rates (Model 3) accounts for 72% of the variation in

incarceration rates at the census-tract level. By comparison, our full model, which includes crime rates and stop-and-frisk rates (Model 6), accounts for 73% of the variation in incarceration rates among census tracts.

Fig. 2 graphs predicted probabilities of incarceration by two dimensions: the Black share of tract population and concentrated disadvantaged (based on Model 6 in *SI Appendix, Table S1*). For both, predicted incarceration rates for non-NYCHA tracts are significantly lower compared with those for NYCHA tracts. Among neighborhoods with 20% Black population, predicted incarceration rate is four times lower in non-NYCHA tracts compared with NYCHA tracts (125 vs. 500). This gap is persistent. At every level of Black share of tract-level population, predicted incarceration rates in NYCHA tracts are on average three to four times higher than in non-NYCHA tracts, holding other observable covariates constant at median levels (Fig. 2 *A* and *B*).

At the midpoint of neighborhood concentrated disadvantage, predicted incarceration rate is two times higher in NYCHA neighborhoods (500 vs. 250). At higher levels of disadvantage (e.g., one SD above the mean), this gap narrows, but predicted incarceration rates in NYCHA neighborhoods are still significantly higher than in non-NYCHA neighborhoods (Fig. 2 *C* and *D*).

How does incarceration rate vary by spatial levels of aggregation? Fig. 3 graphs rates for NYCHA and non-NYCHA neighborhoods at four spatial scales: 2,095 census tracts, 76 police precincts, 177 ZIP Codes, and 758 elementary school zones in New York City. Each of these geographic units varies in spatial boundaries, land mass, population size, and demographic and socioeconomic factors. Yet, incarceration rate data for different levels of geographical aggregation display strikingly similar patterns—incarceration rates are higher in areas with the presence of NYCHA developments (the *P* values from Wilcoxon rank sum test are all below 0.05). Put differently, the NYCHA disadvantage in concentrated incarceration is robust with regard to spatial scale.

The high level of spatial concentration of NYCHA developments in some neighborhoods can generate positive or negative “spatial externality” (i.e., spillover effects on adjacent tracts). As a result of positive externalities, NYCHA tracts surrounded by mostly non-NYCHA tracts might report more depressed incarcerated rates than NYCHA tracts with similar demographic and socioeconomic profiles (63). By contrast, non-NYCHA tracts adjacent to NYCHA tracts might show elevated incarceration rates compared with otherwise similar non-NYCHA tracts due to negative externalities (*SI Appendix, Figs. S2 and S3*). Positive externalities appear rare, though a handful of NYCHA tracts

Table 1. Neighborhood characteristics for NYCHA and non-NYCHA neighborhoods in 2010

Selected neighborhood characteristics	New York City tracts	NYCHA tracts	Non-NYCHA tracts	NYCHA/non-NYCHA ratio
Incarceration rate (per 100,000)	149.00	541.00	117.00	4.62
Total population	3,527.00	4,016.50	3,430.00	1.17
% Population aged 18–35 y	22.46	23.35	22.21	1.05
% Black	7.84	40.32	4.65	8.67
% Hispanic	17.93	27.42	16.47	1.66
Concentrated disadvantaged index	0.22	0.44	0.20	2.20
Concentrated immigration index	0.31	0.27	0.33	0.81
3-y average crime rate (per 100,000)	492.33	502.89	490.92	1.02
3-y average SQF rate (per 100,000)	3,905.65	9,332.82	3,333.88	2.80
No. of census tracts	2,095	372	1,723	N/A

N/A, not applicable.

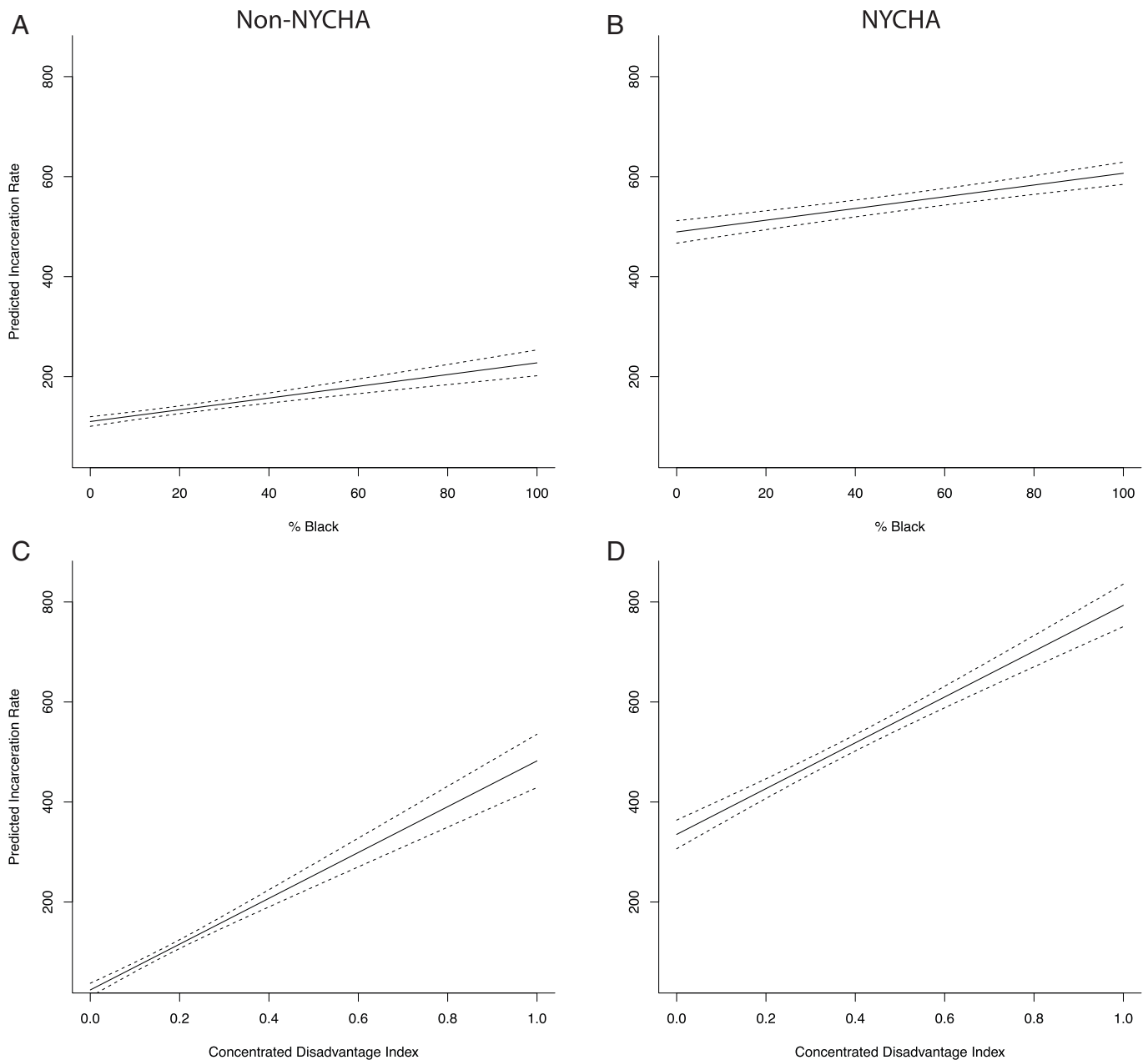


Fig. 2. Predicted incarceration rates by tract-level characteristics for NYCHA and non-NYCHA neighborhoods, holding other observable covariates constant at the median level. Predicted rates are significantly higher in NYCHA neighborhoods than in non-NYCHA neighborhoods at every level of Black share of population (A and B) and of concentrated disadvantage (C and D).

with low incarceration rates surrounded by non-NYCHA tracts with low incarceration rates do exist. In such cases, positive externalities could be acting to keep incarceration rates low in addition to tract-level demographics or socioeconomic factors. For example, the 22 NYCHA tracts with incarceration rates below the median incarceration rate for non-NYCHA tracts have a median Black population of 4% compared with a median of 40% for all NYCHA tracts.

Discussion

Our analysis finds a significant association between public housing and incarceration, providing descriptive evidence for a public-housing-to-prison pipeline in New York City. Our findings have broad implications beyond New York City. The key mechanisms we identified—hypersurveillance and hyperpolicing—are

applicable to other US cities, including Baltimore, Boston, Chicago, Cleveland, Oakland, and Seattle. Collaborations between local PHAs and local police departments are rather common. The evidence is also robust to spatial resolution. The precinct-level analysis is important because this is the geographic scale at which police policy is executed. For example, only 2 among 55 NYCHA precincts have incarceration rates below the median rate for non-NYCHA precincts. The school-level analysis suggests an added layer through which concentrated incarceration facilitates the school-to-prison pipeline for students from NYCHA developments who attended these zoned elementary schools.

We end with policy implications. First, disrupting this public-housing-to-prison pipeline requires substantial governmental, for-profit, and nonprofit investments in local neighborhoods to support minority communities historically impacted by concentrated incarceration. To begin, payments from NYCHA to NYPD

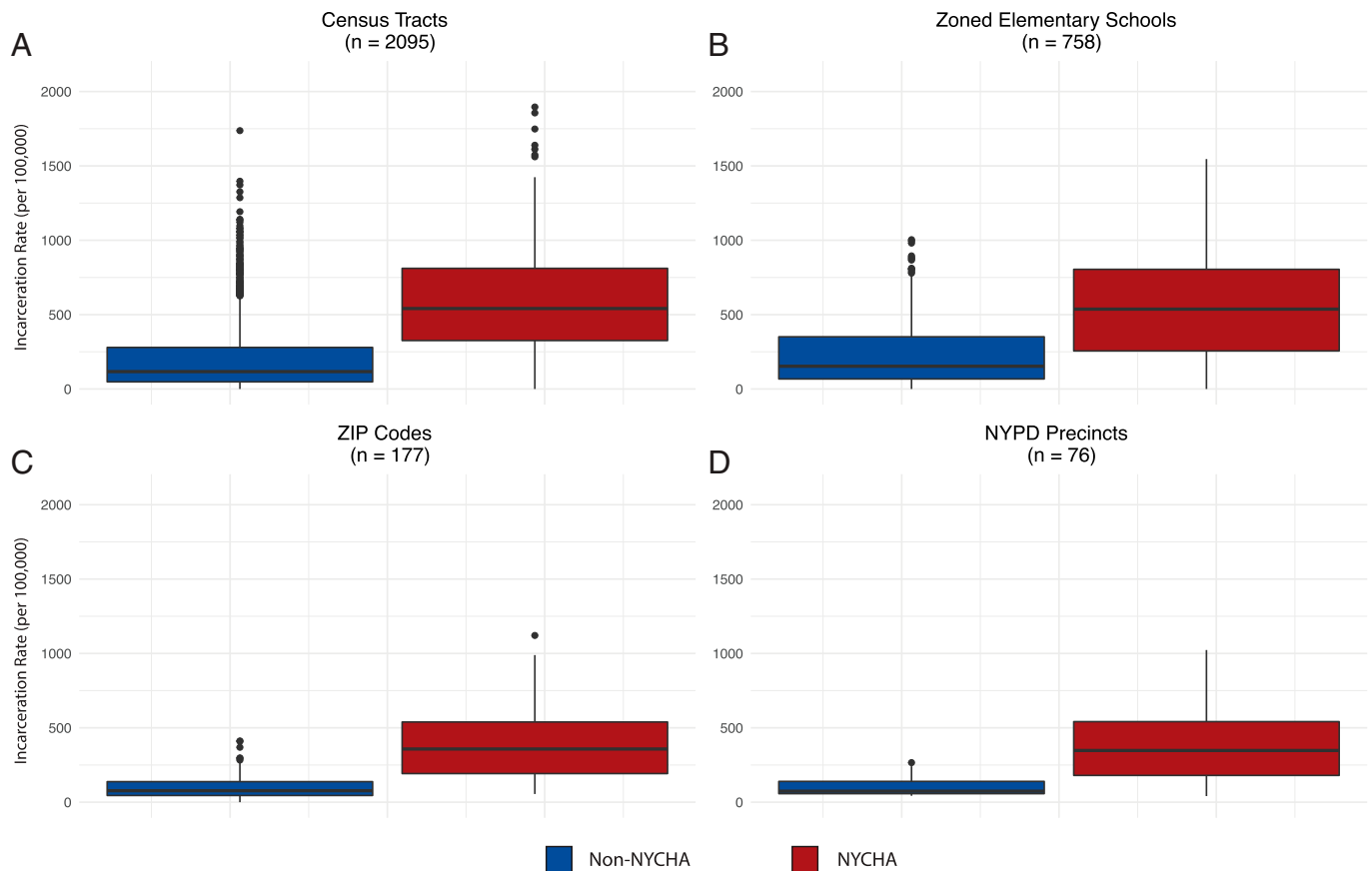


Fig. 3. Incarceration rates for NYCHA and non-NYCHA neighborhoods at different levels of spatial aggregation. The presence of NYCHA housing developments is associated with higher incarceration rates at each level: (A) census tract, (B) zoned elementary school, (C) ZIP Code, and (D) police precinct.

(or from PHAs to local law enforcement agencies) could be permanently redirected and reinvested to enhance the standards of living for residents of public housing developments, including public safety. Moreover, the enormous cost of imprisonment (e.g., \$1.25 billion in fiscal year 2021 for New York City) could be rechanneled toward community reinvestments and decarceration strategies (64).

Second, criminal legal system reform, including changing police practices such as stop-and-frisk policy, can reduce hyperpolicing and hypersurveillance. For example, an alternative approach to absolute reliance on police for establishing safety in NYCHA communities is the Crisis Management System in New York City—an epidemiological approach to violence known globally as the Cure Violence Model (65, 66). Launched in 2014, this system employs teams of “violence interrupters” and “credible messengers” to mediate conflicts, de-escalate disputes, and connect high-risk individuals to social services including employment, mental health, and legal services. What makes this system effective is the inclusion of formerly incarcerated individuals to help mediate violence in their own communities. In 2017, NYCHA’s Queensbridge Houses—the largest public housing development in the United States—had 365 days without a shooting accredited to the onsite community violence intervention program known as 696 Build Queensbridge (65).

HUD funding guidelines explicitly require NYCHA to provide training and employment opportunities for its residents as part of the use of federal funds that support operations. Since the NYPD receives a portion of HUD funding, it is responsible to provide some level of employment and training for NYCHA residents. Payments provided to NYPD from NYCHA could be used to employ NYCHA residents especially under the Cure

Violence Model, which uses neighborhood residents to create safety through mediation practices. New York City has 27 of these sites today.

Let us also be clear: Our analyses did not find elevated crime rates in NYCHA tracts. Although public housing developments are epicenters of concentrated incarceration, our finding lends no support for popular stereotypes of public housing developments as the sites of criminal activities, at least in the case of New York City from 2008 to 2010—a period with historically low crime rates (67). For example, one uncritical implication of our findings is the stigmatization of public housing developments as “criminogenic”—a view that we do not share. This common misperception—that public housing developments are hotbeds of crime—has led to potentially misguided policy interventions, including the demolition of public housing to deconcentrate poverty and the hypersurveillance of such housing developments. Quite the contrary, we argue that more significant and concerted reinvestments in both NYCHA developments and NYCHA census tracts will be critical to the shared project of decarceration.

Third, we need better data collection, integration, and accessibility reforms. Available data and analyses are typically conducted at the tract level, yet policy is frequently executed at higher levels of geographic resolution such as school zones, precincts, or boroughs. Future data collections allowing for multilevel analyses, including individual-level analyses, would be a key improvement. Research collaboration efforts across multiple agencies (e.g., Department of Social Services and Department of Correction) can guide reentry and decarceration. It is also critical to create leadership opportunities for individuals directly impacted by incarceration, including education, advocacy, civic engagement, research and policy development, and implementation.

Finally, improving public housing conditions is critical to future decarceration initiatives (68). Such efforts must address the root causes of mass incarceration in housing developments—intergenerational poverty, trauma, and violence in the context of structural racism. This requires concerted efforts to improve education, housing, health care, employment, and social services in the most disadvantaged neighborhoods. For example, research has documented the efficacy of early childhood educational interventions on violence prevention. Instead of hyperpolicing and hyper-surveillance, investments in programs targeting families, mothers, and early childhood education can be consequential (68). Moreover, the opinions of public housing residents should be solicited in the policy-making process (e.g., the recent passage of NYCHA Public Housing Preservation Trust) as we reimagine safety and security in public housing, such that NYCHA residents will feel protected—not harassed and violated—in their own home.

Materials and Methods

This study uses data from the following sources. New York State prison population numbers and incarceration rates at the census tract, police precinct, ZIP Code, and elementary school zone levels are from the Prison Policy Initiative (PPI). US census variables include tract-level measures from the 2010 Decennial Census and 2008 to 2012 American Community Survey (ACS) 5-y estimates. Police precincts containing NYCHA developments were identified using the NYPD's online "Find Your Precinct and Sector" tool. Zoned elementary schools with NYCHA developments were identified using the NYC Department of Education's online "Find a School" tool.

In 2010, there were 2,168 census tracts for New York City in the PPI dataset and 2,095 of them were used for modeling. The remaining tracts were removed because they had total populations less than 300, had excessive variability in total tract population measurements across ACS and PPI datasets, or were missing key covariate data. Similarly, we used 76 police precincts instead of 77, removing one precinct from the analysis because it had a total population of 36.

The dependent variable is tract-level incarceration rates (per 100,000). The independent variable is dichotomous, indicating whether a neighborhood contains at least one NYCHA development. The nested spatial regression models control for tract-level demographic and socioeconomic covariates: percent tract population living in NYCHA housing, percent aged 18 to 35 y, percent Black, percent Hispanic, concentrated disadvantage, concentrated immigration, crime rates, stop-and-frisk rates, and spatial dependence on incarceration rates. To facilitate interpretations, we use the natural log version of demographic variables (2010), average local crime rates (2007 to 2009), and average stop-and-frisk rates (2007 to 2009). The regression coefficients for the logged independent variables have a straightforward interpretation: One percent increase in tract-level characteristics among these covariates is associated with $\beta_i/100$ increase in tract-level incarceration rates in 2010.

Specifically, the nested spatial regression models follow this equation:

$$\hat{Y}_i = \beta_0 + \beta_1 NYCHA_i + \beta_2 P_i + \beta_3 \bar{Y}_i + \beta_4 \log D_i + \beta_5 I_i + \beta_6 \log C_i + \beta_7 \log S_i + \varepsilon \quad [1]$$

where \hat{Y}_i denotes incarceration rate in tract i . $NYCHA_i$ denotes presence of a NYCHA housing development in tract i . P_i is percentage of NYCHA population living in tract i . \bar{Y}_i is the spatial lag term recoding the average value of incarceration rates in all census tracts contiguous to tract i . D_i is a vector of demographic census variables for tract i . I_i are concentrated disadvantage and concentrated immigration indices in tract i . C_i is average local crime rate (per 100,000) in

tract i . S_i is average local stop-and-frisk rate (per 100,000) in tract i . (C_i and S_i adjudicate between the two possible mechanisms behind the link between public housing and incarceration by capturing crime rates and surveillance level.) ε is the error term.

The percent NYCHA term (P_i) represents the percentage of residents in each census tract that reside in NYCHA housing developments (i.e., NYCHA population for each tract divided by the tract population in 2010.) We use the 2008 NYCHA Development Data Book to identify and assign NYCHA population to the census tract to which each NYCHA development belongs.

The spatial lag term is computed from census tract incarceration data and indicates the average incarceration rate in contiguous census tracts. The Moran's I score records the degree of spatial autocorrelation in the incarceration rate data and a score greater than 0.51 ($P < 0.001$) indicates significant spatial autocorrelation. The median Moran's I score for the incarceration data is 0.34, and 32.8% of census tracts have Moran's I scores greater than 0.51.

The concentrated disadvantage index was constructed based on a principal component analysis of four tract-level measures: percent below poverty line, percent receiving public assistance, percent unemployed, and percent female-headed households with children under age 18 y (Cronbach alpha = 0.855). The concentrated immigration index was constructed based on a principal component analysis of three tract-level measures: foreign-born population, population immigrated in the last 10 y, and population ages 5 y and older that does not speak English well or at all (Cronbach alpha = 0.802).

Given that average length of stay in jail in NYC—from arrest to transfer to state prison—is 10.7 mo (69), the crime rates and stop-question-and-frisk rates for each census tract were computed as the 3-y average rate from 2007, 2008, and 2009. To compute crime rates, we use data from historic NYPD Complaint Data and filtered for four major felony crimes (murder, rape, grand larceny, and grand larceny of motor vehicle). We use coordinate data indicating locations of individual incidents to geocode them onto census tracts to determine the total number of incidents for each tract for a given year. These values were converted into a rate per 100,000 using data from the 2006 to 2010 ACS 5-y estimate. The rates for 2007, 2008, and 2009 were averaged to produce the 3-y crime rate for each tract.

To compute stop-question-and-frisk rates, we use data from the NYPD Stop, Question, and Frisk database. Coordinate data indicating the locations of individual stop-question-and-frisk events were geocoded onto census tracts to determine the total number of events for each tract for a given year. These values were converted into a rate per 100,000 using population data from the 2006 to 2010 ACS 5-y estimate. The rates for 2007, 2008, and 2009 were averaged to produce the 3-y average stop-and-frisk rate for each census tract.

This study results from collaborative research involving two researchers who were both former NYCHA residents, were formerly incarcerated, and are college graduates. At every stage of the research, the lived experiences of J.H. and I.C. have informed our analytical decisions. We situate this work within a long tradition of community-based participatory research which uplifts and centers the voices of historically marginalized individuals and disadvantaged groups in the United States. This study was inspired by Jamel Holder, who was deeply impacted by the public-housing-to-prison pipeline and was eventually murdered after his release from prison.

Data Availability. All replication materials have been deposited in Harvard Dataverse (https://dataverse.harvard.edu/dataverse/Holder_2022). All other study data are included in the article and/or *SI Appendix*.

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