

Title: The Association of Census Tract-Level Incarceration Rate and Life Expectancy in New York State

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Supplementary Materials: Supplementary Methods, Table, and Figures:

Supplementary Material: Methods

Boundaries of quintiles:

Incarceration rate (incarcerated individuals per 100,000 population):

- 1st quintile: 0-37
- 2nd quintile: 38-88
- 3rd quintile: 89-162
- 4th quintile: 163-389
- 5th quintile: 390-3,335

% of population with less than complete highschool education:

- 1st quintile: 0-6
- 2nd quintile: 6.1-9.8
- 3rd quintile: 9.9-14.5
- 4th quintile: 14.6-23.6
- 5th quintile: 23.7-69

% of population that identifies as Black:

- 1st quintile: 0-0.6
- 2nd quintile: 0.7-2.4
- 3rd quintile: 2.5-7.5
- 4th quintile: 7.6-30
- 5th quintile: 30.1-98.7

Population density (population per square mile):

- 1st quintile: 0-1450
- 2nd quintile: 1451-5443
- 3rd quintile: 5444-16421
- 4th quintile: 16422-47410
- 5th quintile: 47411-208131

Missing Data:

Missing data on those incarcerated: Per the Prison Policy Initiative, the total population of people housed within New York State prisons at the time of the 2010 census was 57,810. New York

State redistricting officials were able to reallocate 46,003 people to home addresses within New York State. In addition, there were 11,807 people they were unable to reallocate: 2,433 from other states, 1,276 without usable addresses, and 8,098 addresses that were incomplete and not easily fixed. Thus, 79.6% of total prisoners, or 83.1% of prisoners originally from a New York State home address, were reallocated to their home address. Unfortunately, we do not know the characteristics of the excluded people.

Missing life expectancy data: Per the authors of USALEEP, life expectancy data was not calculated on census tracts with a population count smaller than 5000 people over five years, with zero deaths, and tracts with a standard error of life expectancy at birth of four or more years were not reported. There were 372 tracts out of 4,919 within New York State for which we did not have life expectancy data. Twenty-five percent of the census tracts without life expectancy data had a total population under 184 people. For 334 of tracts without life expectancy data, the PPI provided an incarceration rate, including many at the extremes (ie every person from the census tract was incarcerated or no people from the census tract were incarcerated). We have supplied basic summary statistics comparing tracts with and without life expectancy data on our variables of interest in the table below. We had data on these characteristics for all tracts with life expectancy data, and varying numbers of the tracts missing life expectancy data. We provided information on the number of tracts with data in each group.

Additional data sources:

New York State incarceration rates: VOCAL-NY Prison Policy Initiative. Mapping disadvantage: The geography of incarceration in New York State.

<https://www.prisonpolicy.org/origin/ny/report.html>. Published 2020. Accessed 03/12/2020.

American Community Survey data: From the U.S. Census Bureau. We used publicly available 5-year estimates from 2010-2015. For poverty data we used table S1701, education data table S1501, race data table DP05.

Violent Crime: New York City Police Department Complaint Data Historic from 2010.

<https://data.cityofnewyork.us/Public-Safety/NYPD-Complaint-Data-Historic/qgea-i56i> accessed 05/2020.

Population Density: Rural-Urban Commuting Area Codes. Economic Research Service United States Department of Agriculture; 2010. <https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx>. Accessed 04/2020.

Census tracts with prison or jail: Obtained from Prison Policy Initiative for all New York State prisons in 2010 at <https://www.prisonersofthecensus.org/data/>. Accessed 03/02/2021.

Table S1: comparing characteristics of census tracts with and without life expectancy data.

Characteristic	Tracts with life expectancy data n=4,547	Tracts without life expectancy data n=372	Number of tracts without life expectancy data that had information for this variable
Population (Median, IQR)	3,835 (2,415)	2,077 (3,437)	372
Incarceration rate per 100,000 (Median, IQR)	119 (263)	96 (364)	334
Poverty rate (Median, IQR)	12.0 (15.5)	15.2 (25.0)	279
Less than highschool education (Median, IQR)	12.2 (13.7)	8.9 (18.6)	309
% Black (Median, IQR)	21.0 (39.0)	26.0 (36.8)	298
Population density per square mile (Median, IQR)	8,218 (35,873)	3,193 (15,568)	353

Table S2: models 1-6 with betas and confidence intervals for all covariates of interest

Independent variable	Life expectancy mean (difference in years from ref)				NYC census tracts only	
	Model 1 Beta (95% CI)	Model 2 Beta (95% CI)	Model 3 Beta (95% CI)	Model 4 Beta (95% CI)	Model 5 Beta (95% CI)	Model 6 Beta (95% CI)
Incarceration Quintile						
First Quintile	ref	ref	ref	ref	ref	ref
Second Quintile	-0.6 (-0.8 to -0.3)	-0.4 (-0.7 to -0.1)	-0.4 (-0.7 to -0.2)	-0.3 (-0.6 to -0.0)	-0.2 (-0.6 to 0.2)	-0.1 (-0.6 to 0.3)
Third Quintile	-1.3 (-1.5 to -1.0)	-0.9 (-1.1 to -0.6)	-0.9 (-1.2 to -0.7)	-0.6 (-0.9 to -0.4)	-0.3 (-0.7 to 0.1)	-0.2 (-0.6 to 0.3)
Fourth Quintile	-2.6 (-2.8 to -2.3)	-1.9 (-2.1 to -1.6)	-1.9 (-2.2 to -1.6)	-1.3 (-1.6 to -1.0)	-0.9 (-1.4 to -0.4)	-0.7 (-1.2 to -0.2)
Fifth Quintile	-5.5 (-5.7 to -5.2)	-3.7 (-4.0 to -3.3)	-4.3 (-4.7 to -3.9)	-2.6 (-3.0 to -2.2)	-2.4 (-2.9 to -1.8)	-2.1 (-2.7 to -1.5)
<i>P</i> value*	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
% living below poverty						
<15%	-	ref	-	ref	ref	ref
15-35%	-	-0.7 (-0.9 to -0.4)	-	-0.7 (-1.0 to -0.5)	-0.5 (-0.8 to -0.1)	-0.4 (-0.7 to 0.0)
>35%	-	-2.4 (-2.8 to -2.0)	-	-2.4 (-2.8 to -2.0)	-1.9 (-2.5 to -1.4)	-1.9 (-2.4 to -1.3)
<i>P</i> value*	-	<0.001	-	<0.001	<0.001	<0.001
Less than Completed Highschool Quintile						
First Quintile	-	ref	-	ref	ref	ref
Second Quintile	-	-0.7 (-1.0 to -0.4)	-	-0.6 (-0.9 to -0.3)	-0.3 (-0.9 to 0.3)	-0.3 (-0.9 to 0.3)
Third Quintile	-	-1.1 (-1.4 to -0.9)	-	-1.0 (-1.3 to -0.7)	-0.3 (-0.9 to 0.2)	-0.4 (-0.9 to 0.2)
Fourth Quintile	-	-1.6 (-1.9 to -1.2)	-	-1.4 (-1.7 to -1.0)	-0.9 (-1.4 to -0.3)	-0.8 (-1.4 to -0.3)
Fifth Quintile	-	-1.5 (-1.9 to -1.1)	-	-1.6 (-2.0 to -1.2)	-1.3 (-1.9 to -0.7)	-1.2 (-1.8 to -0.6)
<i>P</i> value*	-	<0.001	-	<0.001	<0.001	<0.001
% Black residents						
First Quintile	-	-	ref	ref	ref	ref

Second Quintile	-	-	-0.1 (-0.4 to 0.1)	-0.1 (-0.3 to 0.2)	-0.5 (-1.0 to -0.1)	-0.5 (-1.0 to 0.0)
Third Quintile	-	-	-0.5 (-0.8 to -0.2)	-0.4 (-0.7 to -0.1)	-1.0 (-1.4 to -0.5)	-0.9 (-1.4 to -0.4)
Fourth Quintile	-	-	-0.9 (-1.2 to -0.6)	-0.5 (-0.8 to -0.2)	-1.5 (-2.0 to -1.0)	-1.3 (-1.8 to -0.8)
Fifth Quintile	-	-	-1.7 (-2.1 to -1.4)	-1.6 (-1.9 to -1.2)	-2.3 (-2.9 to -1.8)	-2.1 (-2.6 to -1.5)
<i>P</i> value*	-	-	<0.001	<0.001	<0.001	<0.001
Population Density Quintile						
First Quintile	-	-	-	ref	ref	ref
Second Quintile	-	-	-	-0.7 (-1.0 to -0.4)	-1.4 (-4.9 to 2.0)	-1.5 (-4.9 to 1.9)
Third Quintile	-	-	-	-0.7 (-1.1 to -0.3)	-0.1 (-3.3 to 3.1)	-0.3 (-3.6 to 2.9)
Fourth Quintile	-	-	-	-0.5 (-1.0 to 0.0)	0.1 (-3.2 to -3.3)	-0.2 (-3.4 to 3.0)
Fifth Quintile	-	-	-	0.1 (-0.4 to 0.7)	0.6 (-2.6 to 3.8)	0.3 (-2.9 to 3.6)
<i>P</i> value*	-	-	-	<0.001	<0.001	=0.001
Violent crime rate						
First Quintile	-	-	-	-	-	ref
Second Quintile	-	-	-	-	-	-0.4 (-0.8 to 0.0)
Third Quintile	-	-	-	-	-	-0.6 (-1.1 to -0.2)
Fourth Quintile	-	-	-	-	-	-0.7 (-1.2 to -0.3)
Fifth Quintile	-	-	-	-	-	-1.0 (-1.5 to -0.5)
<i>P</i> value*	-	-	-	-	-	=0.002

Model 1: unadjusted

Model 2: adjusted for % living below poverty level in census tract (3 categories: <15%, 15-35%, >35), % less than highschool (quintiles)

Model 3: adjusted for % residents who identify as Black in census tract (quintiles)

Model 4: adjusted for poverty rate (3 categories), % less than highschool (quintiles), % Black residents (quintiles), and population density (quintiles)

Model 5: model 4 in NYC census tracts only (n=1986)

Model 6: model 5 adjusted for violent crime rate (quintiles) (n=1986)

* F test for joint significance of categorical variable

Table S3: Sensitivity analyses

Dependent variable	Life expectancy mean (difference in years from ref)				
	Model S1* Beta (95% CI)	Model S2* Beta (95% CI)	Model S3* Beta (95% CI)	Model S4** Beta (95% CI)	Model S5* Beta (95% CI)
Incarceration Quintile					
First Quintile	ref	ref	ref	ref	-
Second Quintile	-0.3 (-0.6 to -0.1)	-0.3 (-0.6 to 0.0)	-0.3 (-0.6 to -0.1)	-0.2 (-0.6 to 0.3)	-
Third Quintile	-0.7 (-0.9 to -0.4)	-0.7 (-0.9 to -0.4)	-0.6 (-0.9 to -0.3)	-0.2 (-0.6 to 0.2)	-
Fourth Quintile	-1.3 (-1.6 to -1.0)	-1.3 (-1.7 to -1.0)	-1.2 (-1.6 to -0.9)	-0.8 (-1.3 to -0.3)	-
Fifth Quintile	-2.6 (-3.0 to -2.2)	-2.6 (-3.0 to -2.2)	-2.4 (-2.8 to -2.0)	-2.2 (-2.8 to -1.6)	-
<i>P</i> value***	<0.001	<0.001	<0.001	<0.001	-
Incarceration Decile					
First Decile	-	-	-	-	ref
Second Decile	-	-	-	-	0.1 (-0.2 to 0.5)
Third Decile	-	-	-	-	-0.2 (-0.6 to 0.1)
Fourth Decile	-	-	-	-	-0.3 (-0.7 to 0.0)
Fifth Decile	-	-	-	-	-0.5 (-0.9 to -0.2)
Sixth Decile	-	-	-	-	-0.7 (-1.1 to -0.4)
Seventh Decile	-	-	-	-	-0.9 (-1.3 to -0.6)
Eighth Decile	-	-	-	-	-1.9 (-2.2 to -1.5)
Ninth Decile	-	-	-	-	-2.3 (-2.7 to -1.9)
Tenth Decile	-	-	-	-	-3.6 (-4.1 to -3.1)
<i>P</i> value***	-	-	-	-	<0.001

Model S1: N = 4,522. Removing outliers: all census tracts with a life expectancy >3 standard deviations from the mean in either direction. Full model includes all census tracts, adjusted for poverty rate (3

categories), % less than highschool (quintiles), % Black residents (quintiles), and population density (quintiles).

Model S2: N = 4,409. Removing all census tracts with a prison or jail in 2010. Full model adjusts for % living below poverty level in census tract (3 categories), % less than highschool (quintiles) % Black residents (quintiles), and population density (quintiles).

Model S3: N = 4,547. Full model using quadratic term for all covariates of interest: poverty rate, % of residents with less than complete highschool education, % of residents who identify as Black, population density

Model S4: N = 1,986. NYC tracts alone. Adjusting for total crime rate (quintiles) instead of violent crime rate. Full model includes poverty rate (3 categories), % less than highschool (quintiles), % Black residents (quintiles), and population density (quintiles).

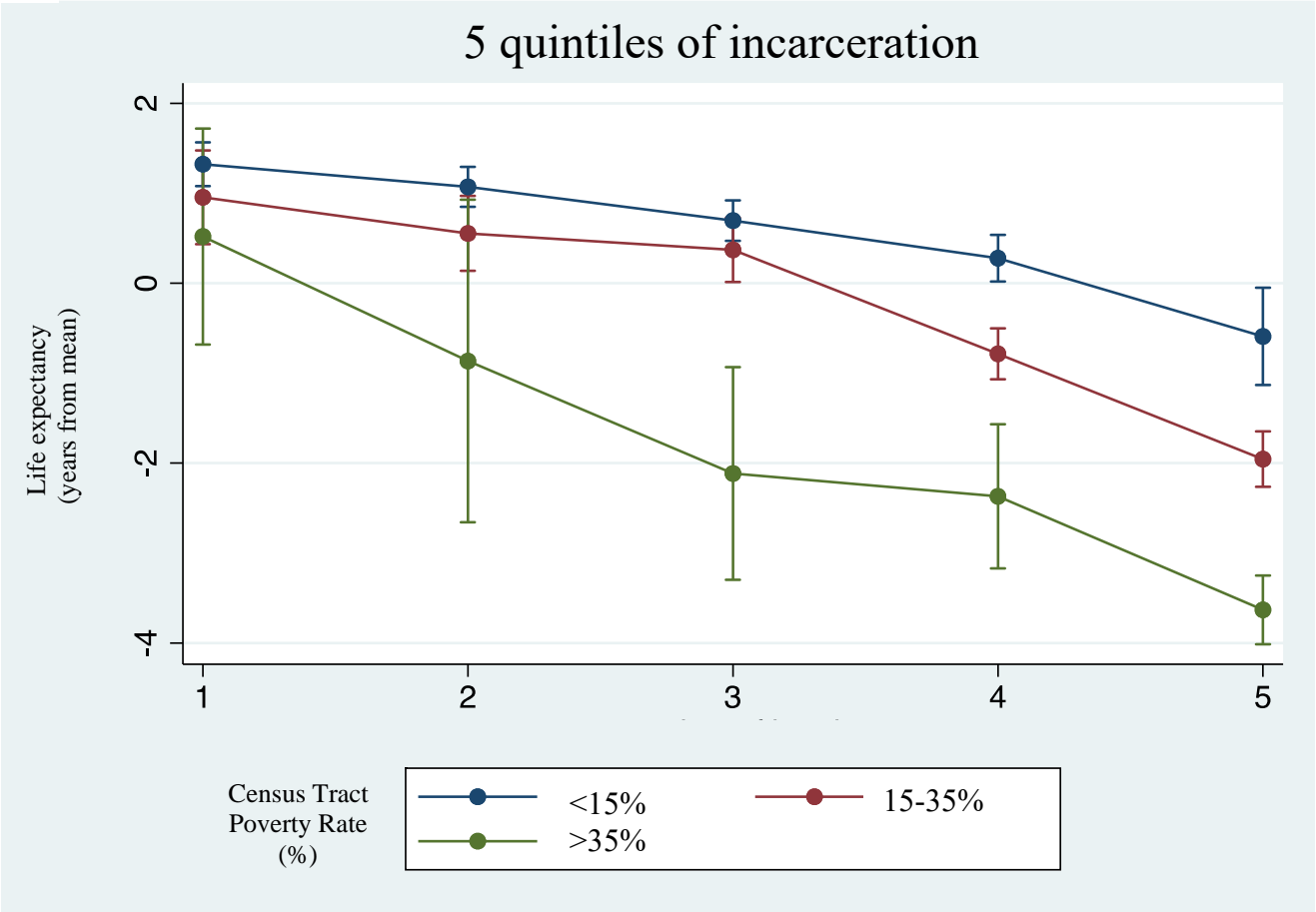
Model S5: N = 4,547. Categorizing incarceration rate as deciles. Full model includes all census tracts, adjusted for poverty rate (3 categories), % less than highschool (quintiles), % Black residents (quintiles), and population density (quintiles).

*Compare with model 4

**Compare with model 6

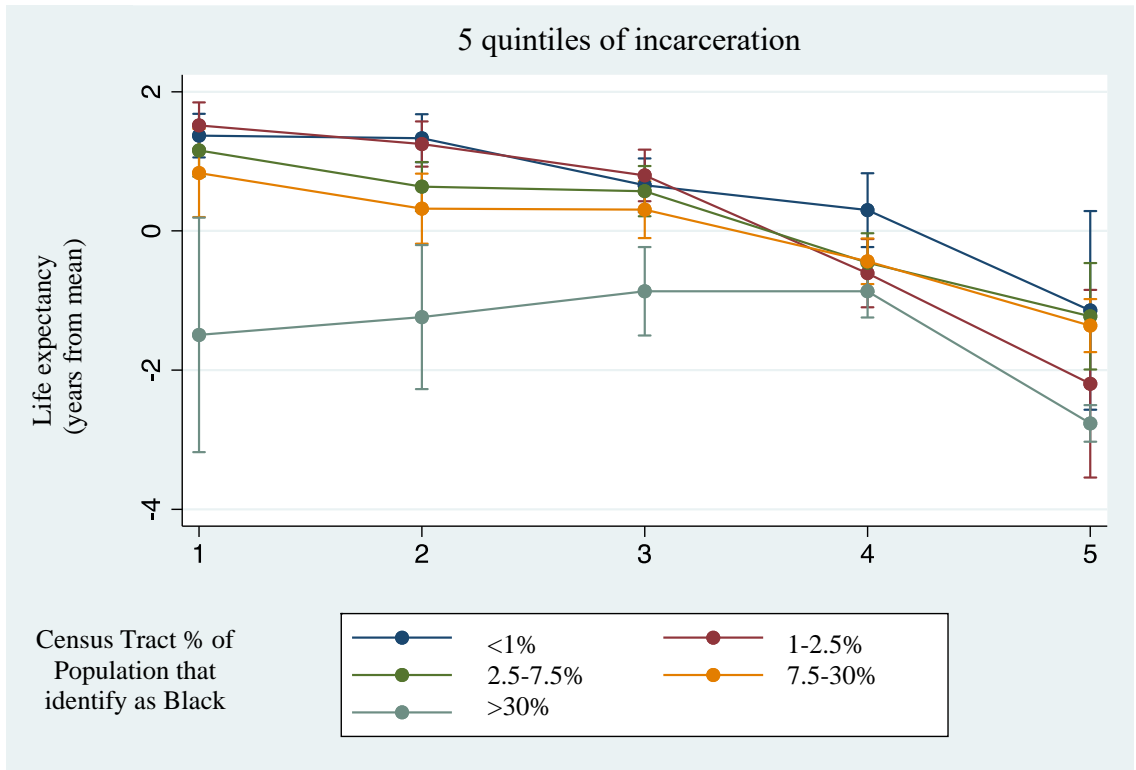
*** F test for joint significance of incarceration rate

Figure S1. Interaction between incarceration rate and poverty rate on life expectancy



P=0.007

Figure S2: Interaction between incarceration rate and percent of residents who identify as Black on life expectancy



P value = 0.004