

Graphic Detail

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Neighborhood Incarceration Rate Hot Spots in Maryland

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Abstract

Maryland's 2010 No Representation Without Population Act requires that census data used for political redistricting be adjusted so that Marylanders incarcerated in state and federal prisons will be enumerated at their last known address rather than their place of incarceration. This report briefly describes why this population adjustment process is important and then uses spatial analysis to identify neighborhood incarceration rate clusters, also referred to as hot spots or cold spots, and outliers. The results are mapped to visualize Maryland's areas of incarceration hot spot and cold spot clusters and outlier areas.

Why the No Representation Without Population Act Matters, and the Resultant Data

What neighborhoods do prisoners come from? In Maryland, that information is public knowledge because the state's 2010 No Representation Without Population Act requires census data used for redistricting purposes to be adjusted so that Marylanders incarcerated in federal and state

correctional facilities will be counted at their last known address rather than their place of incarceration.¹ Maryland was the first state in the United States to enact such a law (Wood, 2014). The U.S. Census Bureau (hereafter, Census Bureau) counts people at their “usual residence” when performing the decennial census enumeration; however, this approach is not always the best way to determine where a person is located. The Census Bureau estimates that approximately 3 percent of Americans do not live in a housing unit but instead live in group quarters, which are defined as “places where people live or stay in a group living arrangement that is owned or managed by an organization providing housing and/or services for the residents” (Stempowski, 2021). Group-quarters facilities are places such as college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, prisons, and worker dormitories.

Counting people at group-quarters locations can be problematic, particularly if they live at correctional facilities, because these citizens become “ghost constituents” (Wood, 2014). Prison gerrymandering is the process by which prisoners are counted at their places of incarceration, which are frequently located in rural communities or areas with predominately White populations (Ebenstein, 2018). Those White populations contrast with the prisoners themselves, who are typically ineligible to vote, are disproportionately of racial and ethnic minorities, and whose origin neighborhoods are depleted of population. The result is often the overrepresentation of rural areas in the political structure, which often have higher shares of White residents when delineating political representation (Stachulski, 2019). The incarceration rate used in this analysis is defined as the share of the population added to a census tract due to the No Representation Without Population Act.

Incarceration Rate by Neighborhood in Maryland

A report from the Prison Policy Initiative describes the high incarceration rate of some neighborhoods in Maryland (Prison Policy Initiative, 2022).² Baltimore City contains 9 percent of Maryland’s population, but 40 percent of prisoners in the state originate from the city.³ Many census tracts on the Eastern Shore, a rural area of Maryland which is poorer and whiter than the central portions of the state, also have elevated levels of incarceration. Previous analysis by the Justice Policy Institute and Prison Policy Initiative concluded that neighborhoods in Maryland with higher rates of incarceration are more likely to have higher unemployment rates, lower educational attainment, decreased life expectancy, greater vacant property rates, and poorer health indicators (Prison Policy Initiative and Justice Policy Institute, 2015).

Exhibit 1 maps the rate of incarceration by census tract in Maryland. Most census tracts (1,258 tracts, or 85.3 percent of the state total) have an incarceration rate of less than 500 per 10,000 population, slightly below the national rate of 0.629 percent (World Prison Brief, 2021). Baltimore City has a clear concentration of neighborhoods with high incarceration rates. The “White L” and “Black Butterfly,” as defined by Lawrence Brown of Morgan State University, appear on maps as

¹ Maryland Sn. 400; Hr. 496. 2010. “No Population Without Representation.” <https://mgaleg.maryland.gov/mgaweb/site/search/legislation?target=/2010rs/billfile/hb0496.htm>.

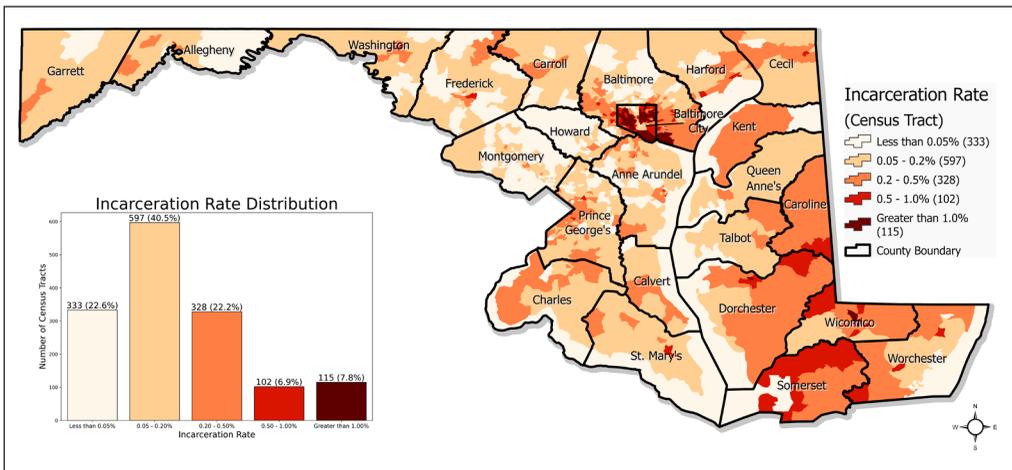
² Maryland Sn. 400; Hr. 496. 2010. “No Population Without Representation.” <https://mgaleg.maryland.gov/mgaweb/site/search/legislation?target=/2010rs/billfile/hb0496.htm>.

³ Baltimore City is an independent city not associated with any county and functions as county-level equivalent in Maryland.

the distinctive geographies in Baltimore that outline race and inequality in the city and nearby suburbs (Brown, 2022). Many census tracts in the southern Eastern Shore area also have high rates of incarceration. Pockets of census tracts with higher rates of incarceration are also present throughout the state, particularly in Prince George’s County along the border with Southeast Washington, D.C., an area with a high density of violent crime, including homicides (Sweet, Alexander, and Alexander, 2020).

Exhibit 1

Incarceration Rate by Census Tract in Maryland, 2020



Source: Data from 2020 Redistricting Data for Maryland (<https://redistricting.maryland.gov/Pages/data.aspx>) and analysis by author

Detecting Neighborhood Incarceration Rate Hot Spots

The data used for this analysis were the number of people incarcerated per population of 10,000. This value ranges from 0 (139 census tracts, or 9.4 percent of neighborhoods) to 3,767, or nearly 4 percent of the population being incarcerated.⁴ That rate is nearly six times higher than the rate for the United States (0.629%), which is the highest rate of incarceration in the world (World Prison Brief, 2021).

This hot spot analysis uses the Cluster and Outlier function in ArcGIS Pro, Esri’s implementation of the Anselin Local Moran’s Index (Anselin, 1995). This core concept of the tool is built on Tobler’s First Law of Geography that “everything is related to everything else, but near things are more related than distant things” (Tobler, 1970). The function has two purposes. First, it produces a Global Moran’s Index, which describes whether a set of values are spatially dispersed, random, or clustered. Second, the function identifies local areas of clustering and outliers. Clustering can be areas of high values surrounded by similarly high values (referred to as High-High) or areas of low values surrounded by similarly low values (Low-Low). Outliers are areas of either high values surrounded by low values (High-Low) or areas of low values surrounded by high values (Low-High). The formula for the function is as follows (Esri, 2022):

⁴ One census tract in southern Baltimore City had an incarceration rate of 8 percent; however, it had only a population of 25 after the adjustment.

$$I_i = \frac{x_i - \bar{X}}{S_i^2} \sum_{j=1, j \neq i}^n w_{i,j} (w_j - \bar{X})$$

where:

- x_i is an attribute for feature i
- \bar{X} is the mean of the corresponding attribute
- $w_{i,j}$ is the spatial weight between feature i and j

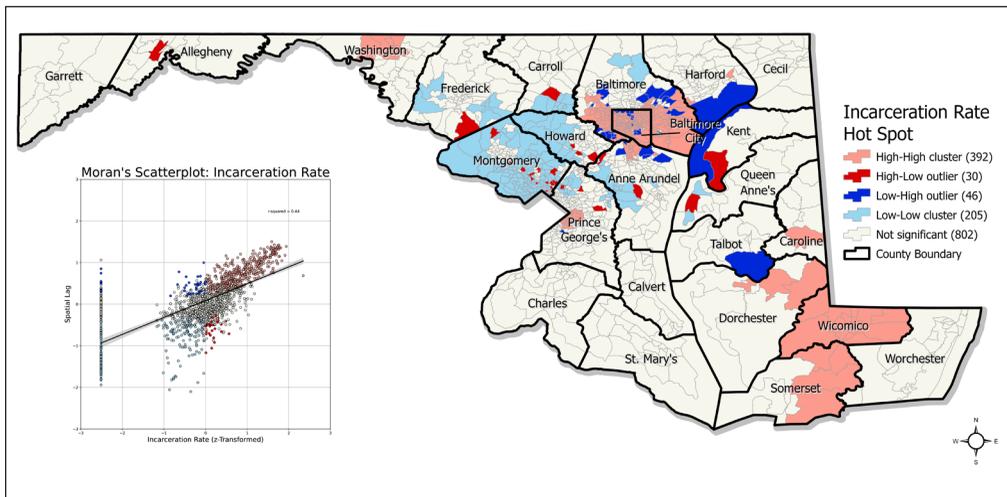
$$S_i^2 = \frac{\sum_{j=1, j \neq i}^n (x_j - \bar{X})^2}{n - 1}$$

with n equating to the number of the feature.

The Cluster and Outlier Analysis function outputs a report describing spatial autocorrelation of a set of values across space or the degree to which the values are clustered, dispersed, or random (Getis, 2010). The Global Moran's Index value was 0.41, indicating a moderately strong degree of clustering.⁵ The census tract-level results that were locally statistically significant are mapped in exhibit 2.

Exhibit 2

Incarceration Hot Spots in Maryland, 2020



Source: Data from 2020 Redistricting Data for Maryland (<https://redistricting.maryland.gov/Pages/data.aspx>) and analysis by author

Hot Spots, areas categorized as High-High, primarily appear in four areas throughout Maryland. The largest High-High cluster is in and around Baltimore City and its eastern and western suburbs. The “White L” and “Black Butterfly” mostly remain visible in this analysis. Several census tracts in western Maryland near Hagerstown, the Eastern Shore, and a portion of Prince George’s County are

⁵ $p < 0.0001$.

also High-High Clusters. Low-Low census tracts tend to cluster in the center of the state, mostly throughout the wealthier suburban counties, such as Frederick, Montgomery, Howard, southern Carroll, northern Prince George's, and western Anne Arundel counties. A few Low-Low census tracts are in Baltimore and Queen Anne's counties.

High-Low outliers, census tracts which have a higher rate of incarceration but are proximate to census tracts with low rates of incarceration, are primarily scattered throughout central Maryland, except for one census tract in Washington County. The High-Low census tract in northern Montgomery County is a signal for potential error in redistricting adjustment because the census tract contains a county detention facility and is in a generally wealthier area surrounded by Low-Low census tracts. Low-High census tracts, neighborhoods with low incarceration rates near census tracts with high incarceration rates, are primarily adjacent to High-High census tracts in and around Baltimore City, except for one census tract in Talbot County. These census tracts have lower incarceration rates, but they are near extremely high incarceration areas in Baltimore City.

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