

Neighborhood Characteristics and Health in Baltimore, Maryland

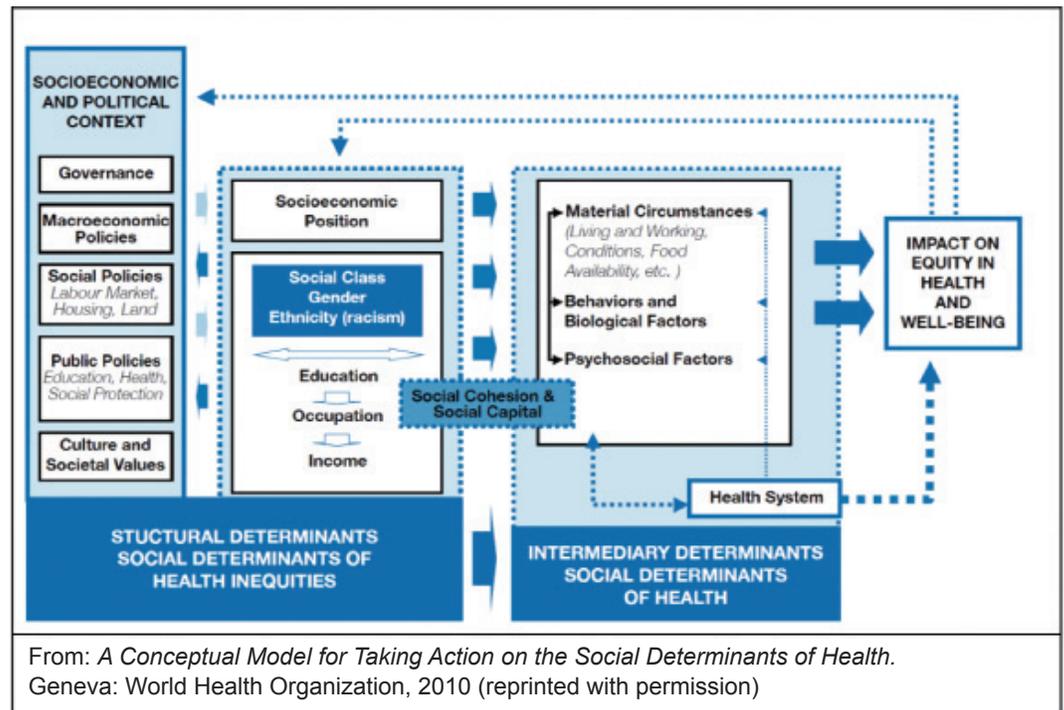
**TECHNICAL REPORT
Center on Human Needs
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Preface

Health is influenced by more than health care, and the same is true for health disparities.¹ Inequities in health exist for reasons that transcend access to health care or adequate health insurance coverage. Health is also heavily influenced by health behaviors (such as tobacco use), modifiable risk factors (such as obesity), and environmental conditions. These conditions are only partly a matter of personal choice. Adopting a healthier diet requires access to supermarkets or farmers' markets that sell fresh produce. Regular physical activity requires a conducive built environment and access to safe parks, pedestrian routes, and green space for residents to walk, bicycle, or play. Tobacco and alcohol use is influenced by enticing advertising and marketing practices. Exposure to environmental pollutants from unhealthy housing or from nearby factories and smokestacks are not choices made by residents but by society.

Figure 1:
World Health Organization
Conceptual Model for Social
Determinants of Health



In the language of social epidemiology, “downstream” determinants of health—ranging from unhealthy behaviors to living and working conditions—are the byproduct of “upstream” structural determinants (Figure 1) such as socioeconomic position, race-ethnicity, occupation, and social cohesion. These socioeconomic circumstances are themselves the result of upstream policies that create opportunities for education and employment, income and savings, social equality, and environmental stewardship. Macroeconomic policies create commercial incentives for industries to either promote unhealthy products or more healthful alternatives.²

Health also varies sharply by geography—across communities and neighborhoods—because unhealthful downstream conditions are often concentrated in disadvantaged areas. Areas populated by the poor or communities of color typically experience greater exposure to unhealthy conditions and material deprivation, a vicious cycle that is itself shaped by upstream factors. These upstream influences include historical antecedents, such as racial or ethnic discrimination and recurring cycles of poverty that inhibit economic growth and social mobility over generations, but also modern-day decisions about where to position highways and supermarkets and how much resource to invest in public transportation, housing, local development, crime prevention, public schools, job training, and social services. The recognition that “place matters” to health and the need to understand how unwise social policies foment health inequity comes at the recommendation of prestigious commissions sponsored by the World Health Organization,³ MacArthur Foundation,⁴ and Robert Wood Johnson Foundation.⁵

About the Place Matters Project

The Place Matters technical reports were produced by the Virginia Commonwealth University (VCU) Center on Human Needs (CHN) in collaboration with the Joint Center for Political and Economic Studies/Health Policy Institute (HPI) and the Virginia Network for Geospatial Health Research (VANGHR). All maps and geospatial analyses were produced by VANGHR.

The production of the Place Matters technical reports was funded by HPI under a subaward from a parent grant from the National Institutes of Health (grant 5RC2MD004795-02). The goal of the project was to prepare and disseminate a series of locally tailored Community Health Equity reports (CHERs) to assess population health inequities and related social and economic conditions for the following eight communities:

- Alameda County, California
- Baltimore, Maryland
- Bernalillo County, New Mexico
- Orleans Parish, Louisiana
- Cook County, Illinois
- San Joaquin Valley, California
- Boston, Massachusetts
- South Delta, Mississippi

The VCU CHN and VANGHR were contracted by HPI to develop technical reports on which the eight CHERs were based. What follows is the technical report for the city of Baltimore, Maryland. The focus of the report and the research questions it addresses were guided by extensive input from the Place Matters team in Baltimore. See the Methods Appendix on the CHN website for more details on analytic methods.

The project was approved by the VCU Institutional Review Board.

For more information about the Place Matters technical reports or collaborating organizations visit the websites listed below:

Center on Human Needs: www.humanneeds.vcu.edu

Health Policy Institute: www.jointcenter.org/institutes/health-policy

Place Matters Initiative: www.jointcenter.org/hpi/pages/place-matters

Virginia Network for Geospatial Health Research: vnghr.org/

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Introduction

The health of Baltimore City residents is related to many factors.⁶ As is true elsewhere, morbidity and mortality rates vary dramatically by age, gender, race, and ethnicity as well as with the prevalence of risky health-related behaviors.^{3,7-12} Place matters in health because characteristics of the areas in which people live, work, and socialize affect their opportunities, behaviors, environmental exposures, and access to medical care.¹³⁻¹⁸ Local conditions that may affect health include levels of stress and environmental toxins, the social and economic characteristics of individuals and families (such as education and income), and the characteristics of the communities in which people live.

Regional statistics oversimplify important geographic differences that exist between neighborhoods and communities within Baltimore City that contribute to large differences in the health of residents. Geographic disparities in health status within the city of Baltimore reflect, in part, past and present geographic patterns in the population and living conditions. The health of individuals and households in a given place and time are influenced by and reflected in current and historical community conditions.^{19,20} Regardless of one's education, income, or motivation to make healthy choices, exposure to risks introduced by crime, air pollution, lack of places to exercise, inadequate availability of and access to nutritious food, poor schools, jobs scarcity, and stress related to these community challenges can still significantly affect health.^{18,21-29} Historical patterns contribute to long-term trends of placing vulnerable populations in stressed areas. This in turn reinforces cycles of hardship that entrench patterns of socioeconomic disadvantage.³⁰⁻³⁴

This report focuses on the characteristics of the city of Baltimore and its communities that may affect health outcomes for residents, including education, housing quality, and neighborhood conditions. These characteristics are considered in relation to crime and life expectancy. Special consideration is given to the influence of residential segregation and the long-term legacy of historic "redlining" practices. Because regional and citywide statistics elide important geographic differences that exist between neighborhoods and communities in Baltimore City, and because these differences contribute to the large inequities in health among Baltimore residents, this report uses measures at the level of census tracts and Community Statistical Areas (CSAs, which are larger groups of contiguous census tracts).

Part I of this report provides descriptive information about the city of Baltimore and its residential areas, including population data, socioeconomic conditions, and health outcomes. Part II focuses on the historic practice of redlining and its correlation with longitudinal measures of distress throughout Baltimore. Part III examines the relationship between the quality of housing and neighborhoods and educational opportunity and how they relate to crime and health at the neighborhood level. Part IV presents conclusions drawn from these analyses. Appendices A and B on the CHN website present details about the data and methods that were used in preparing this report.



Part I. Background: Population, Community Characteristics, and Health in Baltimore City

Population

Baltimore is located roughly 30 miles north of Washington, DC, off the coast of the Chesapeake Bay in the eastern portion of Maryland. With a population of 637,418 in 2009,³⁵ Baltimore is Maryland's most populous city and, in part because of its location on the Chesapeake Bay, a major seaport in the mid-Atlantic region. The overall population density in Baltimore was 7,973.3 persons per square mile in 2009 but ranged by census

Table 1:
Demographic Characteristics
of City of Baltimore, the
State of Maryland,
and the United States

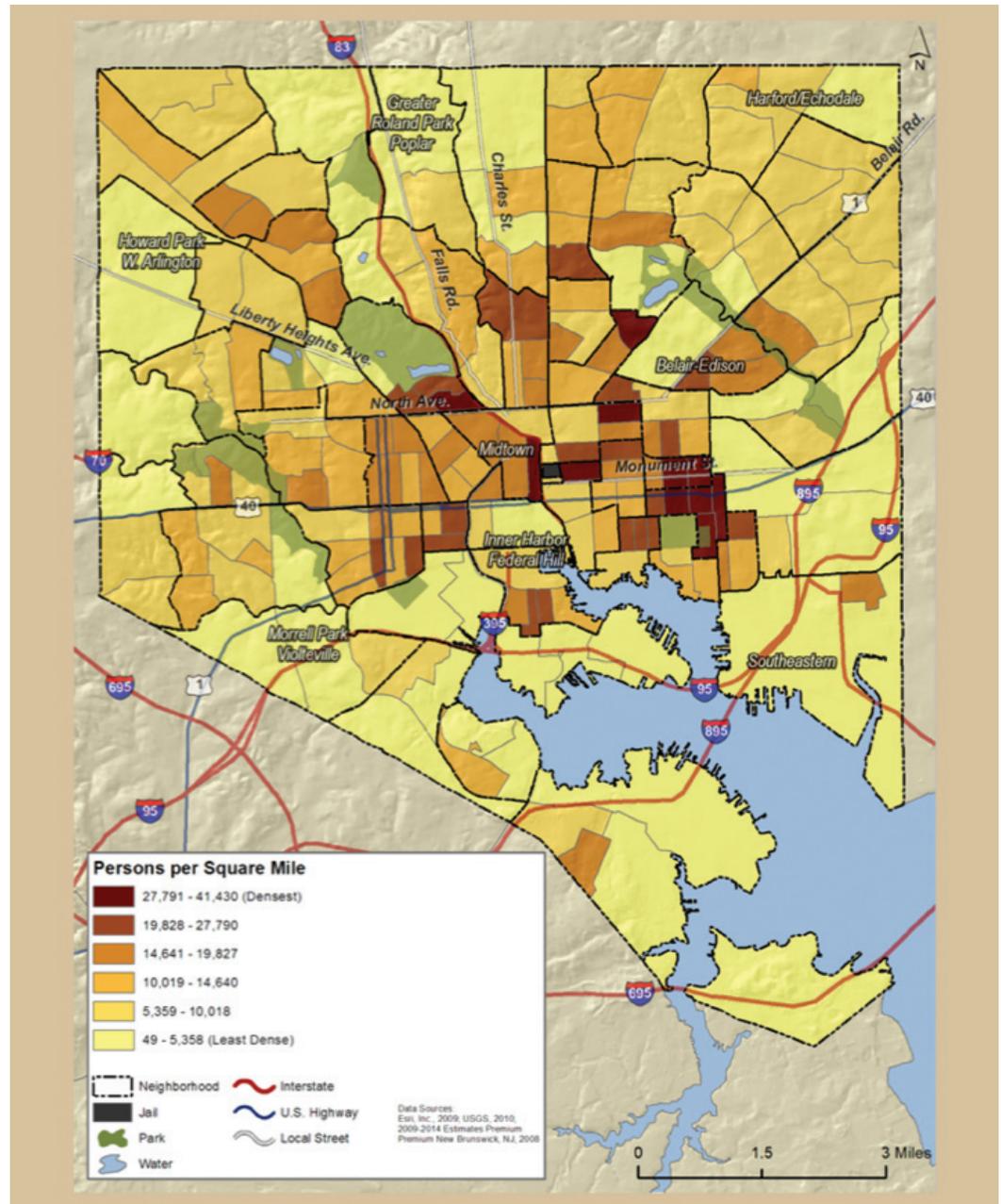
	Baltimore	Maryland	United States
Population (2009)(a)	637,418	5,699,478	307,006,556
Persons Per Square Mile (2009)(b)	7,973.3	586.3	86.7
Gender (2009)(a)			
Male (%)	46.6	48.4	49.3
Female (%)	53.4	51.6	51.6
Age Group (2009)(a)			
0 to 17 (%)	22.4	24.2	24.6
18 to 44 (%)	41.4	37.5	37.5
45 to 64 (%)	24.3	26.5	25.3
65 or older (%)	11.8	11.8	12.6
Race/Ethnicity (2009)(a)			
White (%)	30.7	56.6	64.9
Black (%)	62.1	28.7	12.1
Hispanic (%)	3.0	7.2	15.8
Asian (%)	1.9	5.1	4.4
Other (%)	2.4	2.4	2.8

(a) U.S. Census Bureau 2009, American Community Survey.

(b) 2009 Geolytics Premium Estimates.

Note: "Other" includes American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, and those who identified themselves as some other race or two or more races. Racial groups include the non-Hispanic population only; Hispanic can include any racial group.

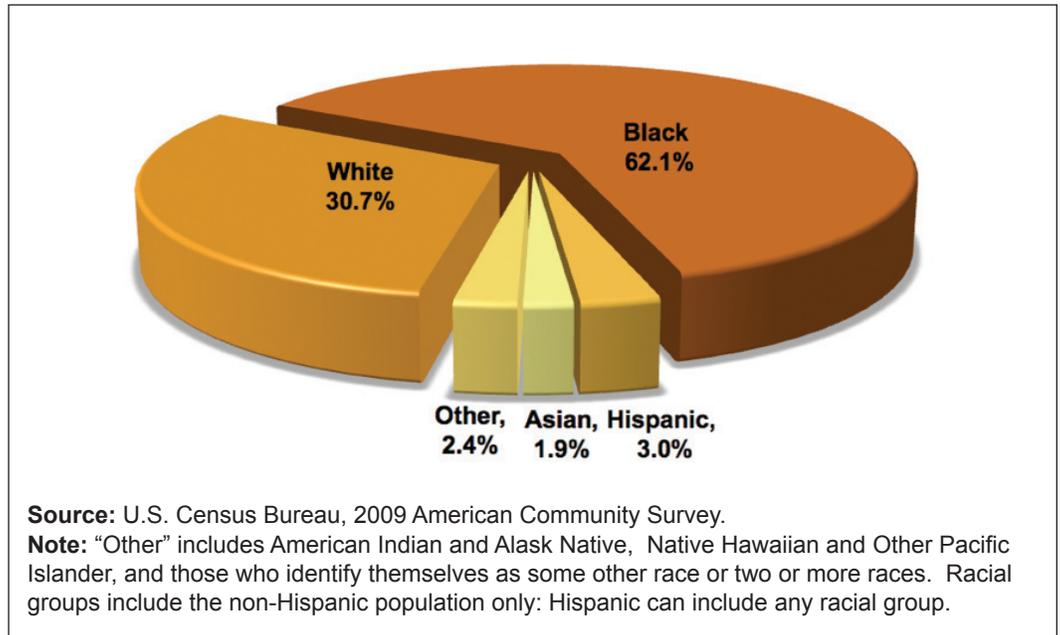
Map 1:
Population Density by
Census Tract, City of
Baltimore (2009)



tract from 48.6 persons per square mile in the Brooklyn/Curtis Bay/Hawkins Point area to more than 41,430 in the Madison/East End area (Map 1).³⁶

In 2009, almost two thirds of Baltimore's population was between the ages of 18 and 64 years (Table 1) and was predominantly Black (62.1%); 30.7% of the population was White, and 3.0% was Hispanic. The Black population makes up a much larger percentage of Baltimore's total population relative to that of Maryland and the United States (28.7% and 12.1%, respectively). Conversely, Baltimore's White population is comparatively smaller than in Maryland and the United States (56.6% and 64.9% respectively), as is its Hispanic population (7.2% and 15.8%, respectively) (Table 1 and Figure 2).³⁵

Figure 2.
Race/Ethnicity in City of
Baltimore, MD (2009)

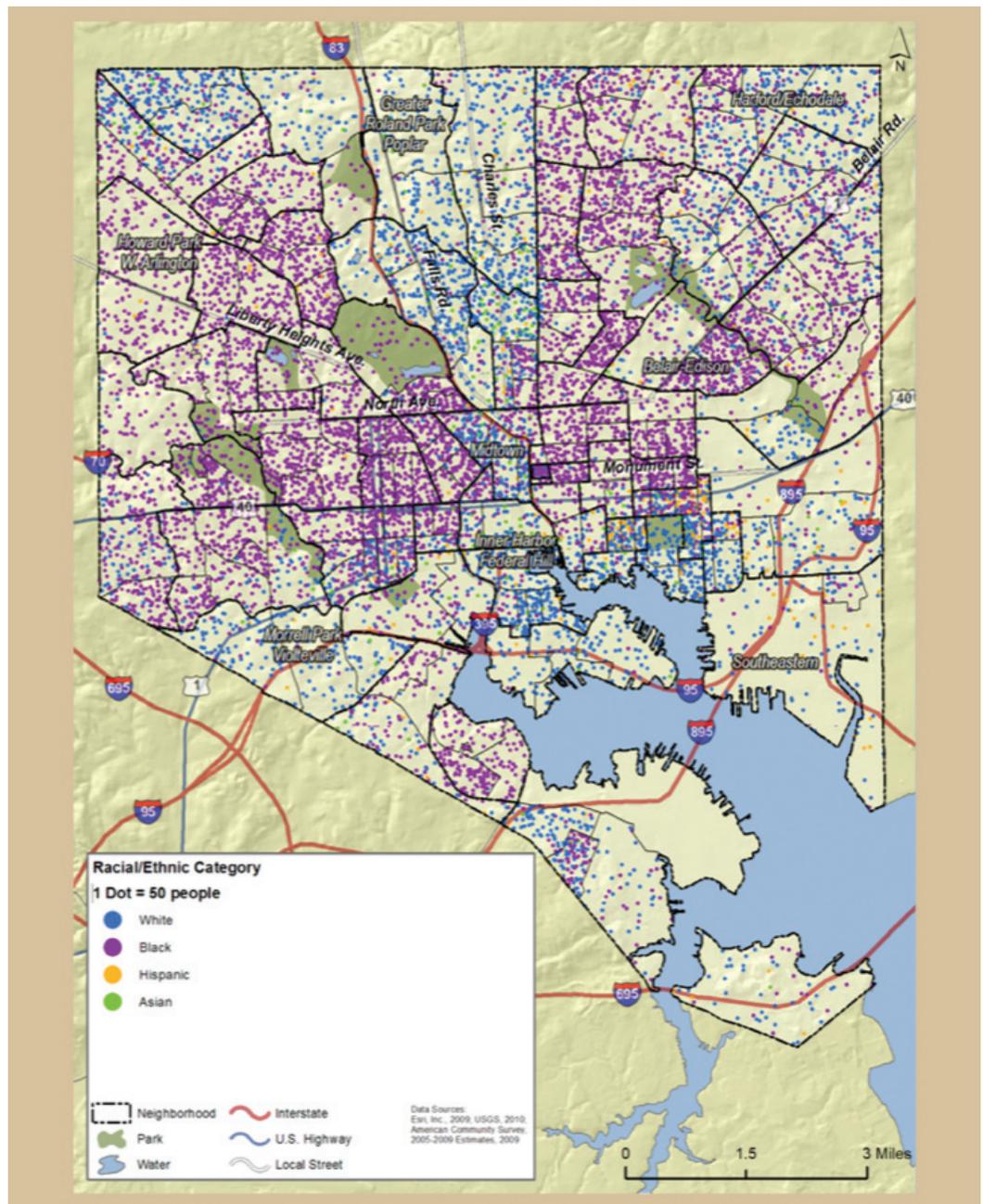


In many instances, people of color have historically been relegated to isolated and segregated communities that perpetuate cycles of hardship through avenues such as limited housing and employment opportunities and lack of access to capital. The extent to which an area is racially segregated may affect population health outcomes.^{18,37–42}

In part because of racial segregation, racial and ethnic groups are concentrated differently in specific areas of Baltimore.^{18,37,38} The Index of Dissimilarity is a measure of residential segregation that quantifies the percentage of the population that would have to move in order to produce a completely integrated community. The higher the value, the more segregated the area. In 2009, the Index of Dissimilarity for the White and Black population of Baltimore was 69.8% at the census tract level.⁴³ This Index of Dissimilarity ranks 13th among the 100 largest metropolitan statistical areas of the United States. Milwaukee, Detroit, metropolitan New York City, Chicago, and Cleveland occupy the top five spots, with an Index of Dissimilarity ranging from 75.6% to 80.9%.⁴⁴ In comparison, the state of Maryland had an index of 65.0% in 2009.⁴³

The diversity index is used to compare racial segregation at smaller geographic levels, such as the census tract. It is a measure of the likelihood that two people randomly chosen from an area will be of a different race or ethnicity. The higher the value, the less segregated the area. Although the index for Baltimore as a whole is 50.8%, the index ranges by census tract from 0% (no diversity) in tracts found in Sandtown-Winchester/Harlem Park, Greater Mondawmin, Greater Rosemont, and Brooklyn/Curtis Bay/Hawkins Point to 70.4% (high diversity) in Patterson Park North and East (between South Highland Avenue and Southeast Avenue and East Monument Street and Bank Street).

Map 2:
Racial and Ethnic
Distribution, City of
Baltimore (2005–2009)



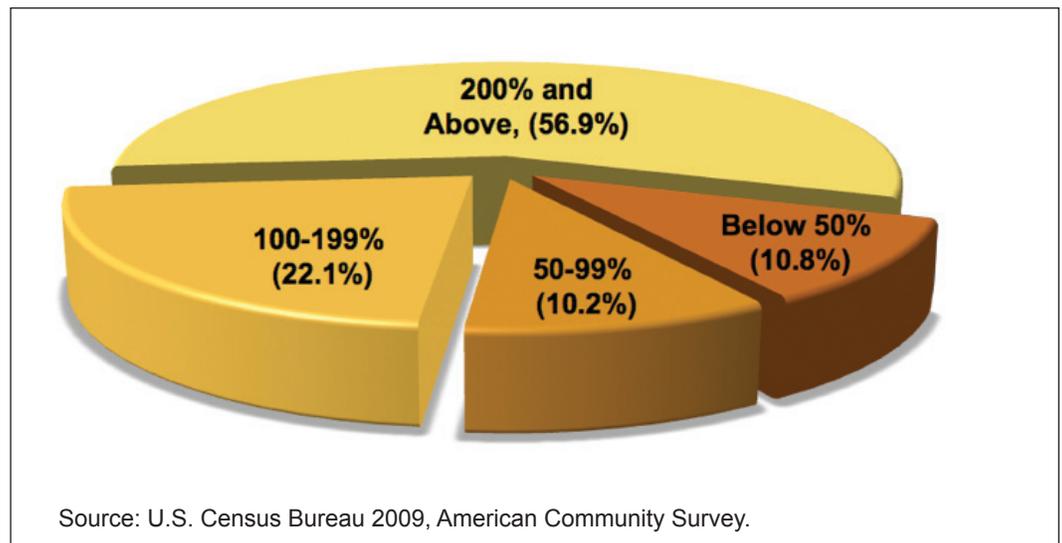
The racial and ethnic distribution throughout Baltimore is illustrated in Map 2. Areas with a concentration of purple dots are predominantly Black, whereas areas with a concentration of blue dots are predominantly White. The most diverse census tracts are in Patterson Park North and East. Half of the tracts in Highlandtown, Medfield/Hampden/Woodberry/Remington, and Morrell Park/Violetville are more than 90% White, whereas all of the tracts in Cherry Hill, Clifton-Berea, Dorchester/Ashburton, Edmonson Village, Forest Park/Walbrook, Greater Mondawmin, Greater Rosemont, Howard Park/West Arlington, Midway/Coldstream, Pimlico/Arlington/Hilltop, Sandtown-Winchester/Harlem Park, Southern Park Heights, and Upton/Druid Heights are more than 95% Black.

Socioeconomic Characteristics

As is true of other communities, socioeconomic conditions in Baltimore exert an important—and often unrecognized—influence on health status. Exposure to exogenous stress where people live, work, and play can affect health regardless of the quality or access to health care. Nationally, families living below the federal poverty level (FPL) are 3.6 times more likely to report fair or poor health than are those with incomes of at least twice the poverty level.⁴⁵ These daily stressors “are, in turn, created by political, social and economic forces.”³

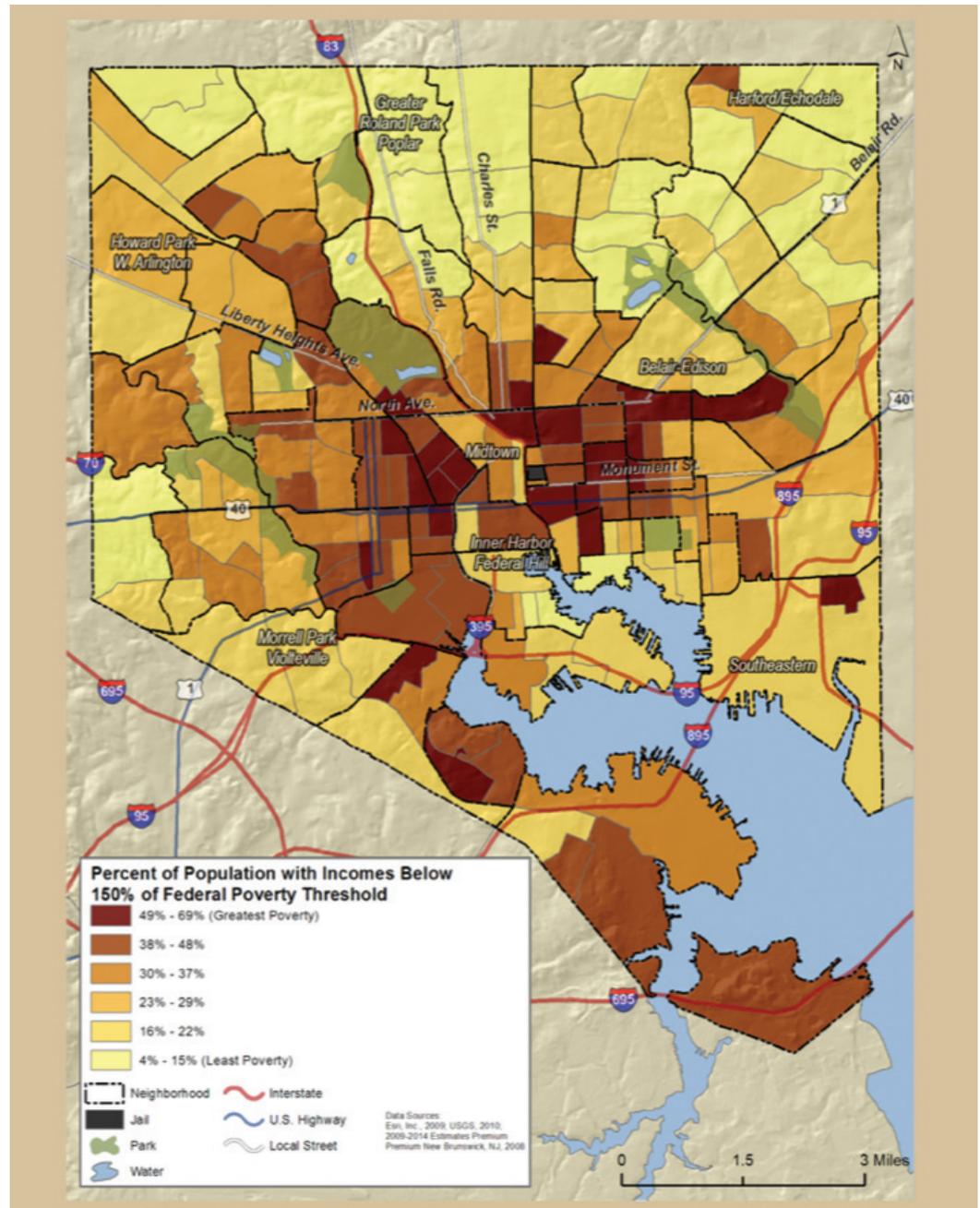
As of 2009, more than one fifth (21.0%) of households in Baltimore had incomes below the FPL.³⁵ The income-to-poverty ratio expresses household income as a percentage of the FPL. In 2009, 10.8% of households in Baltimore earned less than half the FPL (or a 0.5 income-to-poverty ratio), and 43.1% earned less than twice the FPL (Figure 3).³⁵ For a family of four, this was less than \$44,100 in 2009.

Figure 3:
Ratio of Income to Poverty,
South Delta (2005-2009)



The U.S. Census Bureau estimates that 23.6% of U.S. households had incomes below 150% of the FPL in 2009.³⁵ In Baltimore, 32.8% of the population had income less than 150% of the FPL, and 40.2% of Baltimore census tracts—representing 80 tracts—met or exceeded this level of poverty.³⁶ The spatial distribution of this population in Baltimore is illustrated in Map 3. At least half of the population earned less than 150% of the FPL in at least half of the census tracts in Jonestown/Oldtown, Perkins/Middle East, Southeastern, and Upton/Druid Heights.

Map 3:
Poverty by Census Tract,
City of Baltimore (2009)



Education

Education is a pathway to higher income and net worth and can also have a strong influence on health status and access to health care. In 2009, American adults (age 25 years and older) with less than a high school education or equivalent had less than half the earnings (\$18,432 versus \$47,510),³⁵ were three times more likely to die before age 65, and were more than six times more likely to lack health insurance as compared with those with a college education.⁴⁶ They were also more likely to engage in unhealthy behaviors such as cigarette smoking.⁴⁷

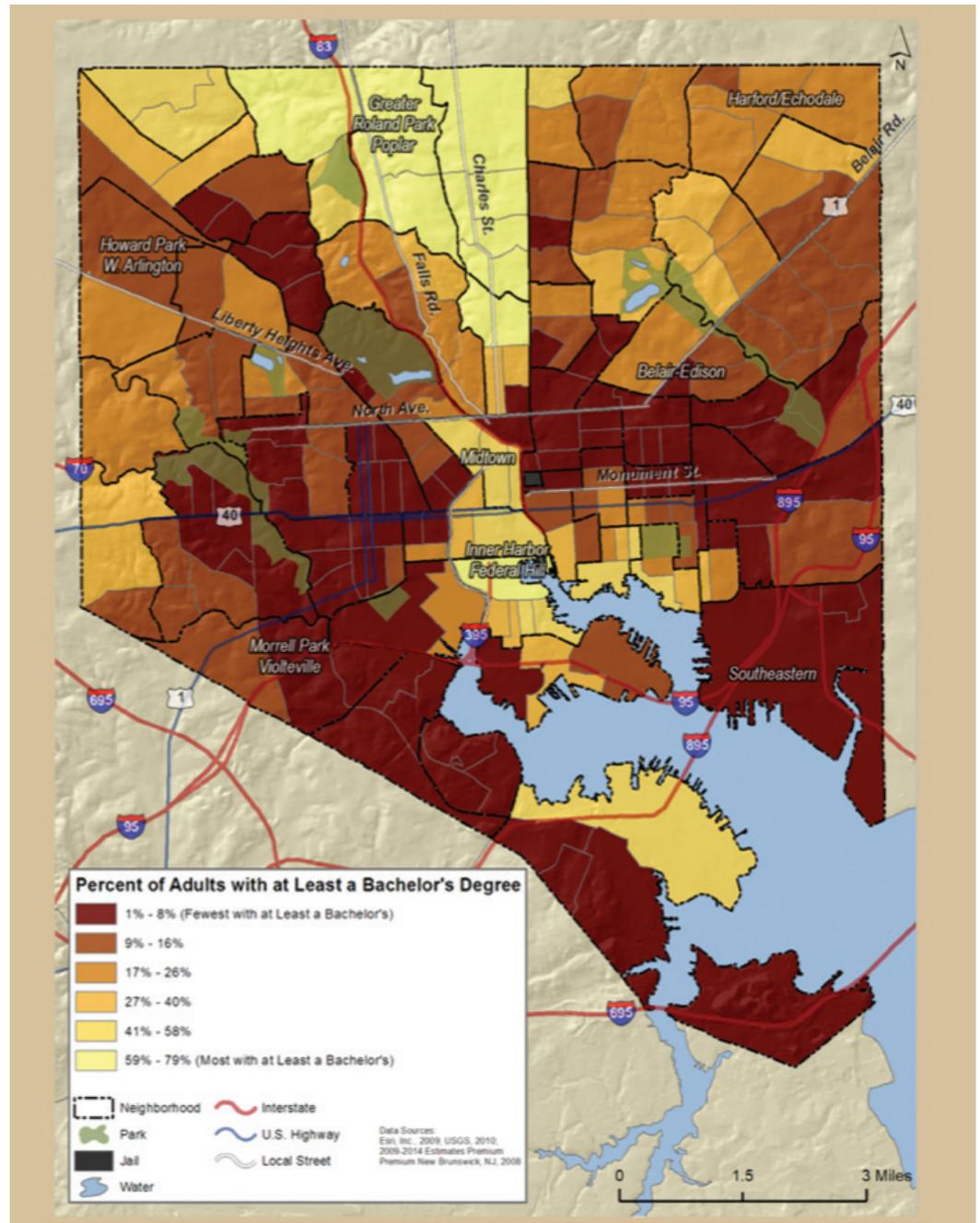
Table 2:
Socioeconomic
Characteristics of the City
of Baltimore, the State of
Maryland, and the
United States

	Baltimore (%)	Maryland (%)	United States (%)
Educational Attainment			
Less than High School	19.7	11.8	14.7
High School Only	30.8	26.7	28.5
Some College	23.4	25.8	28.9
Bachelor's Degree or Higher	26.1	35.7	27.9
Poverty Rate			
Below 50%	10.8	4.2	6.3
50-99%	10.2	4.9	8.1
100-199%	22.1	12.4	18.4
200% and Above	56.9	78.5	67.3

(a) U.S. Census Bureau 2009, American Community Survey.

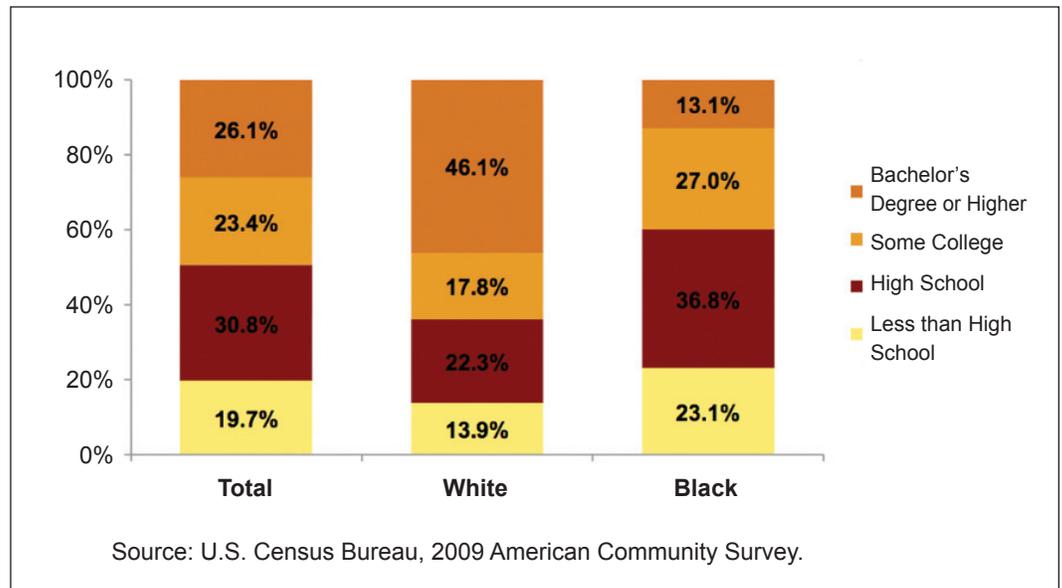
In 2009, the percentage of the adult population with at least a Bachelor's degree was lower in Baltimore than in either Maryland or the United States (Table 2).³⁵ This value, however, varies greatly by neighborhood. In at least half of the census tracts of Cherry Hill, Claremont/Armistead, Clifton-Berea, Greenmount East, Midway/Coldstream, Sandtown-Winchester/Harlem Park, Southern Park Heights, Southwest Baltimore, and Washington village, less than 5% of adults possessed a Bachelor's degree in 2009 (Map 4). (Note that these data do not track where Baltimore residents' education occurred—within or outside of the city and its educational system—only their level of educational attainment at the time of data collection.)

Map 4:
 Adults with a
 Bachelor's Degree,
 by Census Tract,
 City of Baltimore (2009)



Race and ethnicity are strong predictors of educational attainment. Compared with non-Hispanic White adults in 2009, Black adults in Baltimore were more than three times less likely to have earned a Bachelor's degree (Figure 4).³⁵ Black adults in Baltimore were also significantly more likely to lack a high school diploma than were non-Hispanic White adults.³⁵

Figure 4:
Educational Attainment in
Baltimore City, MD (2009)



Besides educational attainment, measures of educational proficiency also vary by place. The National Assessment of Educational Progress (NAEP) draws samples of students in the 4th, 8th and 12th grades to gauge the level of proficiency in various subjects. In 2009, the percentage of Baltimore 4th and 8th graders who scored below basic proficiency in reading, mathematics, and science was higher than the same rate for the state of Maryland.⁴⁸ In most grades and subjects, the percentage that was below basic proficiency in Baltimore was twice the rate seen in Maryland.⁴⁸

Health Outcomes

Disparities in health outcomes based on demographic factors are well established. In 2007, life expectancy at birth for the United States was 77.9 years: 73.6 years for Blacks, compared with 78.4 years for Whites.⁴⁹ Nationally, Blacks had the highest age-adjusted premature mortality rate (death before the age of 65 years) among racial or ethnic groups in 2007. The Black rate for prematurely mortality was 163.2 premature deaths per 100,000 persons higher than the White rate, which is a rate ratio of 1.7 Black premature deaths for every White premature death. In Baltimore, Blacks had a rate difference of 259.1 more premature deaths per 100,000 residents compared with Whites, which is a rate ratio of 1.8 Black premature deaths for every White premature death.

Race is also strongly associated with birth outcomes. The infant mortality rate in the United States for 2007 was 6.8 deaths per 1,000 live births, but outcomes differed significantly by race⁵⁰: The infant mortality rate was 5.7 per 1,000 for White mothers and 12.5 per 1,000 for Black mothers.⁵⁰ Infant mortality is more than 24 times greater for infants with a birthweight of less than 2,500 grams than it is for infants at or above this weight.⁴⁹ In the United States, Black mothers are almost twice as likely to deliver a child

with a low birthweight as compared with White mothers (13.7% to 7.2% respectively).⁴⁹ Black mothers in Baltimore and Maryland are also at an increased risk of low birthweight (Table 3).

Table 3.
Health Characteristics
of City of Baltimore,
the State of Maryland,
and the United States

	Baltimore City	Maryland	United States
Life Expectancy	72.7 ^(a)	78.7 ^(b)	77.9 ^(c)
Premature Mortality* (2007)^(d)	490.5	239.5	231.1
Non-Hispanic	496.8	246.2	238.4
Hispanic	N/A	103.1	173.0
White	331.6	205.5	221.5
Black	590.7	358.5	384.7
All Cause Mortality Rate* (2007)^(c)	1,078.1	783.1	760.2
Non-Hispanic	1,089.0	796.5	776.3
Hispanic	298.9	299.7	546.1
Black	1,181.3	935.0	978.6
Low Birth Weight Rate (2008) (%)^(e)	12.8	9.2	8.2
Non-Hispanic (%)	13.2	9.6	8.6
Hispanic (%)	6.6	7.0	7.0
White (%)	8.8	7.2	7.2
Black (%)	15.1	13.1	13.7

(a) Calculations performed by the VCU Center on Human Needs from 2005–2009 death data from the Baltimore City Health Department and population data from the 2009 Geolytics Premium Estimates and 2001–2008 Geolytics Premium Estimates datafiles.

(b) Calculations performed by the VCU Center on Human Needs from 2007 death data provided by the Centers for Disease Control and Prevention CDC WONDER Online Data Tool and population estimates from 2001–2008 Geolytics Annual Premium Estimates Database.

(c) Health, United States 2010: With Special Features on Death and Dying; the Centers for Disease Control and Prevention: 2007.

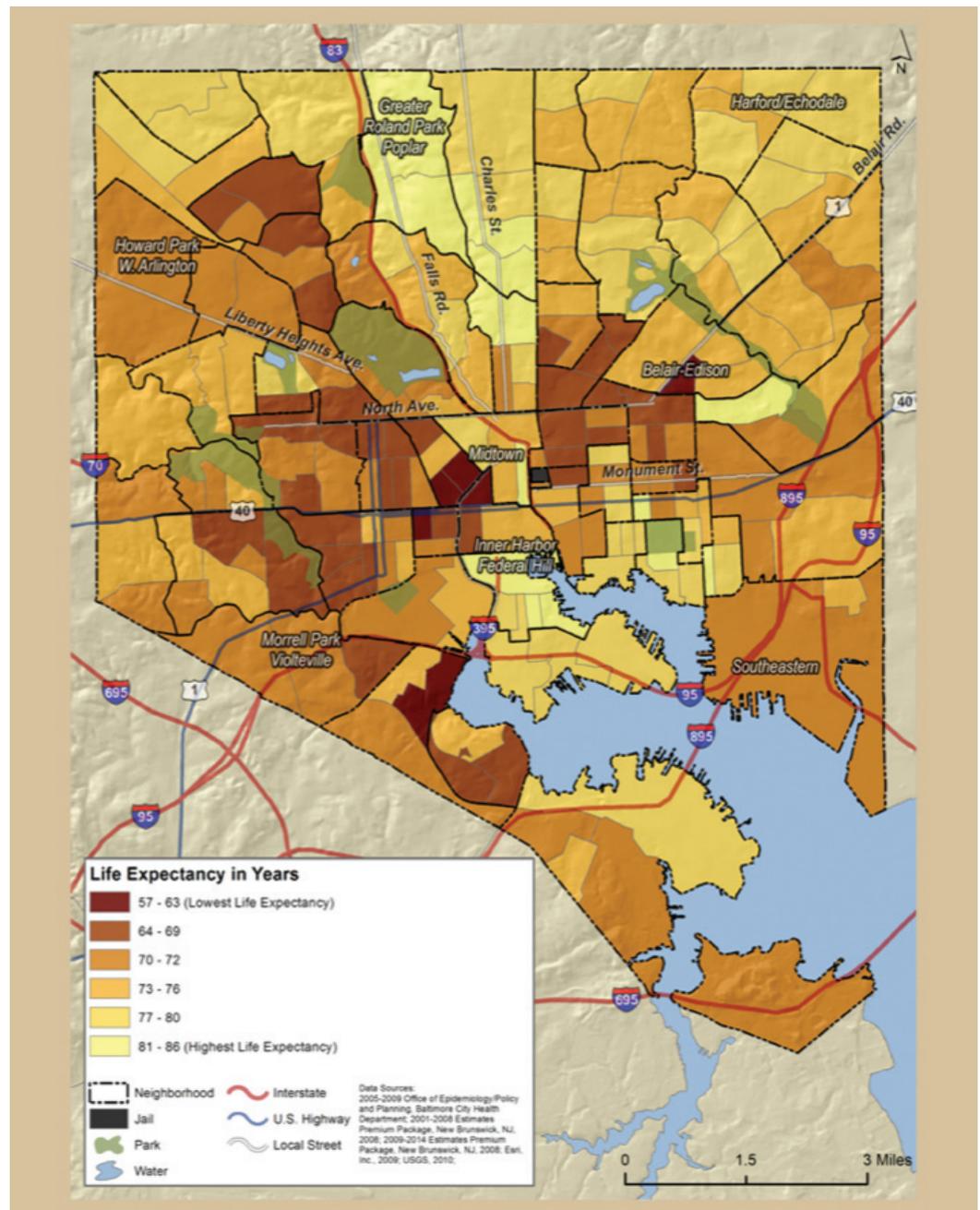
(d) 2007 Centers for Disease Control and Prevention CDC WONDER Online Data Tool.

(e) National Center for Health Statistics, National Vital Statistics Report Volume 58, Number 17. 2006.

* Mortality statistics are per 100,000 population

Given the geographic variation in socioeconomic factors that affect health in Baltimore, it follows that health outcomes—including life expectancy—vary sharply by neighborhood as well (Map 5). Between 2005 and 2009, life expectancy varied by 29.6 years between census tracts in Baltimore. The highest value (86.3 years) was found in Greater Roland Park/Poplar between Falls Road and North Charles Street, north of Wyndhurst Avenue. The lowest value (56.7 years) was found in Upton/Druid Heights between North Fremont and Pennsylvania Avenue, north of West Franklin Street.

Map 5:
Life Expectancy by
Census Tract, City of
Baltimore (2005–2009)



Other health outcomes—including HIV/AIDS mortality, drug-induced mortality, and homicides—vary sharply by place as well. Cherry Hill, Poppleton/The Terraces/Hollins Market, Sandtown-Winchester/Harlem Park, and Upton/Druid Heights all commonly have mortality rates for these categories that are in the 10 highest for CSAs in Baltimore, as well as having life expectancies in the bottom 10. The distribution of adverse outcomes is in part determined by social, economic, and demographic factors, all of which may be influenced by local, state, and federal policies seemingly disparate from health. Part II of this report will investigate the long-term impact of redlining policy on distress in Baltimore neighborhoods.

Part II. Racial Segregation, Redlining, and Community Distress

A strong body of literature finds that health is dependent on far more than health care.^{3,9-12} Policies and community conditions that affect the well-being of a population (such as distribution of wealth, educational opportunity, employment opportunities, safe communities, adequate food sources, well-maintained and reliable housing, and lack of exposure to environmental pollutants) also play a role in determining health. For example, people living in areas with high home ownership tend to have enhanced social bonds, improved psychosocial and physical health, and positive outcomes for youth.⁵¹ Conversely, communities with high per capita rates of liquor stores and vacant buildings/lots tend to have higher rates of crime.⁵²⁻⁵⁴

Because of the association between health and social factors, policy decisions that affect other sectors of daily living may adversely affect health outcomes without decision makers being aware of the ultimate consequences. The city of Baltimore has a long history of housing and lending policies that have had a significant impact on the distribution of racial and ethnic minority communities. The West Ordinance of 1910 attempted to prohibit the transfer of home ownership from a White household to that of a Black household in an area that was majority White.⁵⁵ Such explicit covenants were later declared unconstitutional, but other, more furtive housing policies have contributed to the high level of racial and ethnic segregation seen in Baltimore today.

During the early to mid 1930s, the housing market of the United States was still rebuilding from the Great Depression. In an effort to stimulate both home ownership as well as employment in the construction sector, the federal government passed the National Housing Act of 1934, which established the Federal Housing Administration (FHA).³⁰ As part of its operations, the FHA created the Home Owners' Loan Corporation (HOLC), which aided the cause by purchasing mortgages that had already defaulted from smaller lenders⁵⁶ and selling them back to the original borrowers at lower interest rates and more generous financial terms.³⁰

Table 4:
Present-Day Baltimore
Neighborhoods Redlined
by the Home Owners'
Loan Corporation (HOLC)
in the 1930s

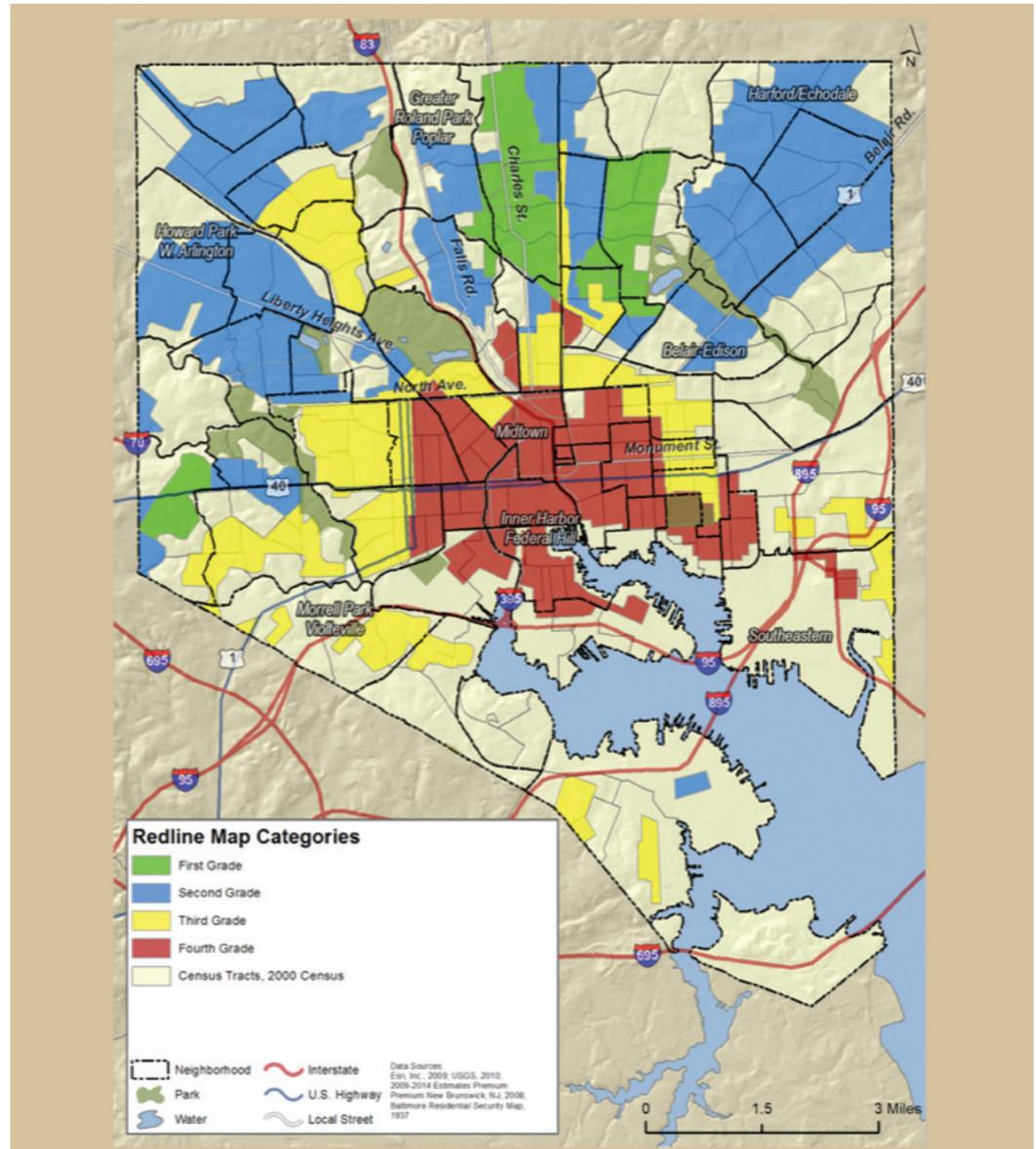
Canton	Clifton-Berea	Downtown/Seton Hill
Fells Point	Greater Charles Village/Barclay	Greater Mondawmin
Greenmount East	Highlandtown	Inner Harbor/Federal Hill
Jonestown/Oldtown	Madison/East End	Medfield/Hampden/ Woodberry/Remington
Midtown	Midway/Coldstream	Orangeville/East Highlandtown
Patterson Park North & East	Penn North/Reservoir Hill	Perkins/Middle East
Poppleton/The Terraces/Hollins Market	Sandtown-Winchester/Harlem Park	South Baltimore
Southeastern	Southwest Baltimore	The Waverlies
Upton/Druid Heights	Washington Village	

Data Source: HOLC residential security maps in HOLC City Survey Files, Record Group 195, National Archives, Washington, DC.

Note: Census tracts denoted as "Redlined Tracts" may have been only partially included in high-risk areas of HOLC's Residential Security Maps.

HOLC created a series of neighborhood-specific risk appraisals of mortgage markets for all U.S. cities with population sizes exceeding 40,000.^{30,56} The appraisals were operationalized in the form of residential security maps⁵⁶ that were color-coded to signify the level of risk in investment assumed to exist in particular neighborhoods. The risk investment categories used to designate Baltimore neighborhoods are illustrated in Map 6, with blue indicating the lowest risk and red indicating the highest. These maps were also known as “redlining” maps, because high-risk areas were outlined in red. The area of the city primarily affected by this risk classification scheme was in and around the present-day Inner Harbor and Downtown areas. Specific neighborhoods that were at least partially redlined are listed in Table 4

Map 6:
Home Owners' Loan Corporation Residential Security Map for Baltimore circa 1930s (reproduced)



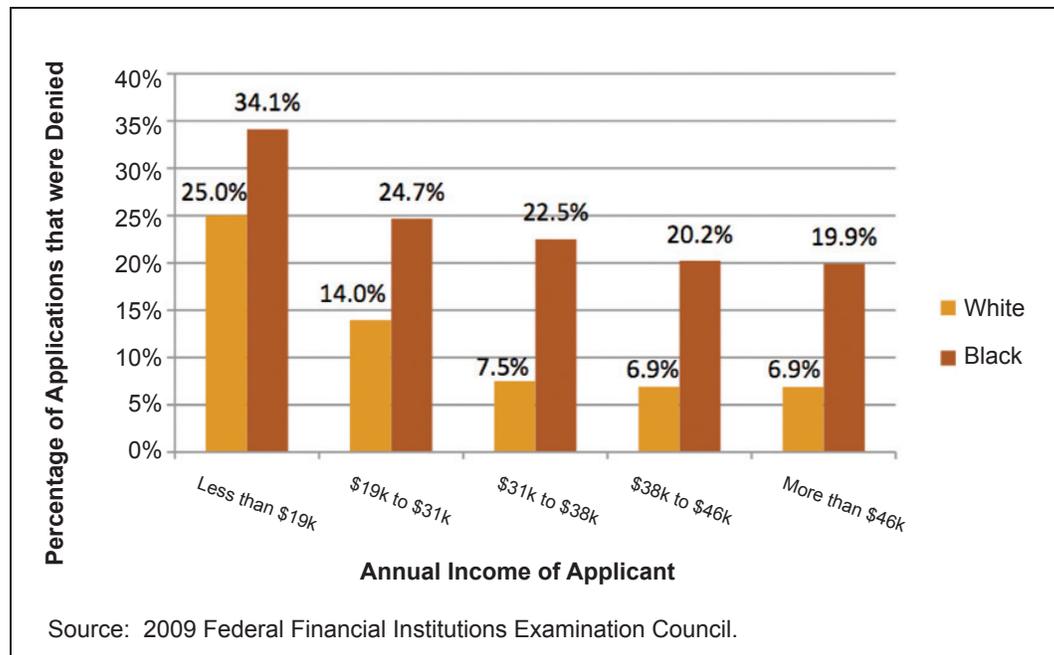
HOLC classified risk on the basis of the age and condition of buildings as well as the presence of an established or even a nascent non-White population.^{30,57,58} New suburban developments that were home almost exclusively to White residents were considered the safest areas in which to invest.^{30,58} These risk assessments had long-term effects on op-

portunities for affordable home ownership, which disproportionately benefitted suburban White residents.³⁰ At the same time, the FHA restructured home loans from the previously restrictive terms to today's more modern terms. However, in order to qualify homes needed to meet FHA loan eligibility standards, including minimum lot size and separation from other structures.^{30,56,58} In addition to marginalizing communities on the basis of racial composition, FHA practices precluded inner city homes such as row houses from eligibility while increasing the availability of credit in the suburbs.⁵⁸

The evidence for a direct effect of the residential security maps on lending practice is inconclusive, with different findings across cities.^{58,59} Although the HOLC effectively gave tacit approval of the federal government to perform such risk assessments, the practice of identifying areas as high risk on the basis of the presence of a non-White community was already in use in the sector.⁵⁸ Findings do suggest, however, that practices such as those used by the HOLC not only made loans to inner-city areas more difficult, they also encouraged White flight to the suburbs, increasing segregation and concentration of poverty in cities such as Baltimore.^{30,58} Although subsequent federal legislation prohibited discrimination in lending practices, this occurred decades after HOLC instituted redlining.⁶⁰⁻⁶²

The assessment practices used by HOLC—and perpetuated by FHA loans in the 1940s to early 1960s—reduced the availability of credit for members of racial or ethnic minority groups. Although such practices are no longer permissible by federal law, there remains a discrepancy between the availability of home loans for Black Baltimore residents compared with White Baltimore residents. The percentage of home loan applications that were denied by race in Baltimore in 2009 is shown in Figure 5. Even within income groups, Black Baltimore residents were more likely to be denied home loans than were White residents.

Figure 5.
Percentage of Home Loans Denied by Race and Income, Baltimore-Towson MSA (2009)



Data are presented in Table 5 on the relationship between historical redlining and persistent “distress” from 1970 to 2009 related to home ownership, poverty, segregation, and education according to whether or not any part of a census tract was redlined by HOLC in the 1930s. We define distress in each of these categories as follows:

- **Home Ownership:** Census tracts in the bottom quartile for the percentage of housing units that are owner-occupied
- **Poverty:** Census tracts in which greater than 20% of the population is below the FPL
- **Segregation:** Census tracts in which at least 90% of the population is one race
- **Education:** Census tracts in the bottom quartile for the percentage of adults with a Bachelor’s degree

Any tract that meets these definitions and has done so since at least the year 2000 is considered to be in persistent distress. We investigated tracts at five points in time: 1970, 1980, 1990, 2000, and 2009.

Table 5:
Persistent Distress by
Redline Status, City of
Baltimore (1970–2009)

	Redlined Census Tract (%)	Non-Redlined Census Tract (%)
Home ownership (census tracts in the lowest quartile for home ownership rate)		
Distressed Since At Least 2000	46.8**	9.8**
Distressed Since At Least 1970	35.1**	5.7**
Poverty (poverty rate > 20%)		
Distressed Since At Least 2000	53.2**	26.8**
Distressed Since At Least 1970	44.2**	13.8**
Segregation (tracts with 90% or more one race)		
Distressed Since At Least 2000	48.1	47.2
Distressed Since At Least 1970	42.9*	30.1*
Education (census tracts in lowest quartile for adults with a Bachelor’s degree)		
Distressed Since At Least 2000	20.8	15.4
Distressed Since At Least 1970	7.8	4.9
Data Source: 2009 Geolytics Premium Estimates; Geolytics Neighborhood Change Database.		
Note: Census tracts denoted as “Redlined Tracts” may have been only partially included in high-risk areas of HOLC’s Residential Security Maps.		
*Statistically significant at P < .10.		
**Statistically significant at P < .05.		

The findings in Table 5 show that previously redlined census tracts were significantly more likely to have distress spanning several decades in terms of home ownership and poverty. Census tracts that were at least partially redlined in the 1930s were almost five times more likely to be in the lowest quartile for home ownership in at least two census periods and more than six times more likely to be so for at least five census periods. Redlined tracts were twice as likely to experience persistent poverty and more than three times more likely to do so for at least five census periods. Differences were not significant between redlined and non-redlined census tracts for the proportion of adults with a Bachelor's degree or the proportion of tracts in which one race/ethnicity comprised 90% or more of the population at the 95% confidence level.

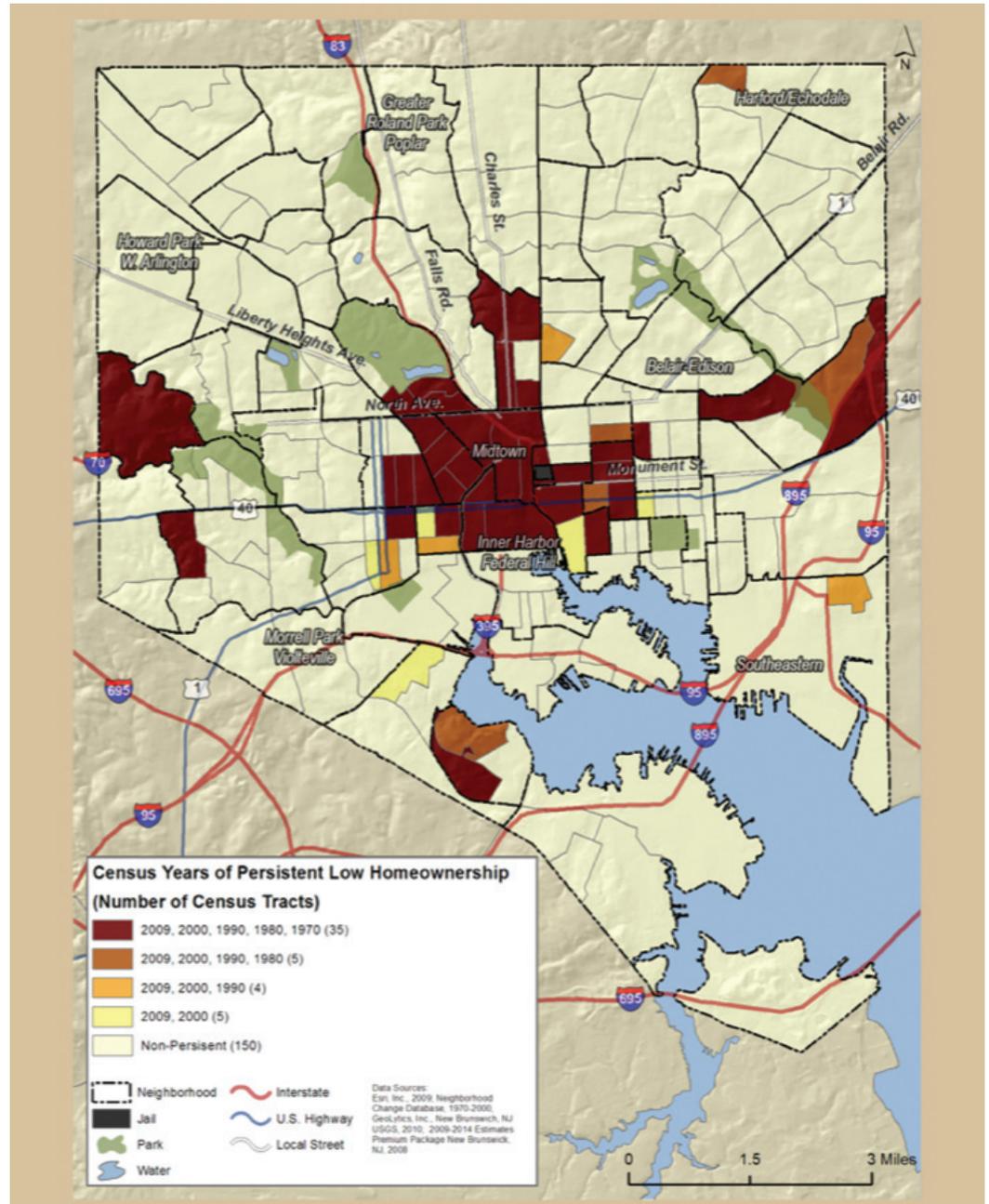
These results are suggestive of the long-term effects of redlining, but they should not be viewed as conclusive because (1) overlay of the historic redlining map with current census-tract boundaries is imperfect and includes census tracts that may have been only partially redlined, and (2) redlining was largely based on racial composition of neighborhoods, which in itself is potentially related to historical and contemporary socioeconomic conditions and demographic characteristics of communities. Because racial segregation and redlining were intertwined, caution is warranted in making assumptions about causal pathways leading to the indicators of distress examined here.

We produced a series of longitudinal maps in order to further investigate the relationship between historically redlined areas and persistent distress in Baltimore over the past five decades (1970–2009). The census tracts of Baltimore that have persistently been in the lowest quartile for home ownership—an indicator of a lack of wealth—are illustrated in Map 7.⁶³ The area framed by Kirby Lane, Route 1, and North Washington Street (north of the harbor) that was redlined in the residential security map has many census tracts that have had low owner occupancy rates over the past five decades. The previously redlined neighborhoods of Downtown/Seton Hill, Midtown, and Upton/Druid Hill have been in the lowest quartile over this period. Not all areas with persistently low home ownership were historically redlined (such as Dick-eyville/Franklinton).

Those tracts that were redlined appear to have lower home ownership rates overall, but not all redlined areas currently have low ownership rates. A few areas of Baltimore that were redlined by HOLC during the 1930s have been significantly redeveloped since that time. As a result of this investment, our metrics of distress in these areas are not as high as would be predicted on the basis of the areas having been redlined. This is likely a result of shifting populations rather than a reduction in the level of distress of the original population. The most significant redevelopment activity has occurred in Baltimore's Inner Harbor. As shown in Map 6, this area was almost entirely redlined by HOLC in the 1930s. At the time, it was mainly an industrial port, but from as early as the late 1950s when the 33-acre Charles Center was built,⁶⁴ significant investment had been made in transforming the neighborhood to a high-tourism area. A more recent development proj-

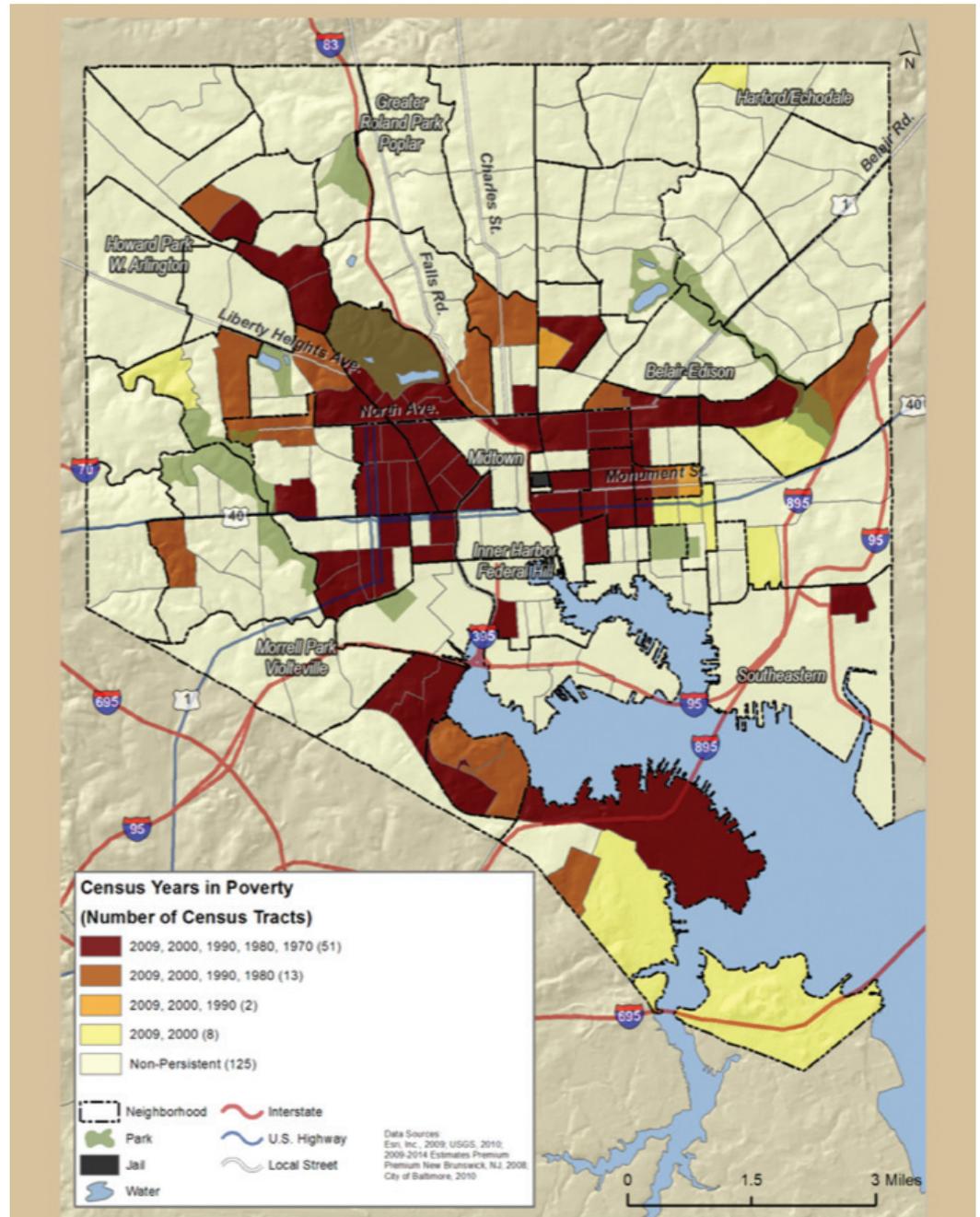
ect is East Baltimore Development, Inc. (EBDI). Starting in 2004, the initiative functioned by acquiring properties, relocating households, and rehabilitating areas.⁶⁵ These properties have been predominantly between East Federal Street and East Monument Street, east of Broadway Boulevard.

Map 7:
Persistent Lack of Home Ownership, Baltimore (1970–2009)



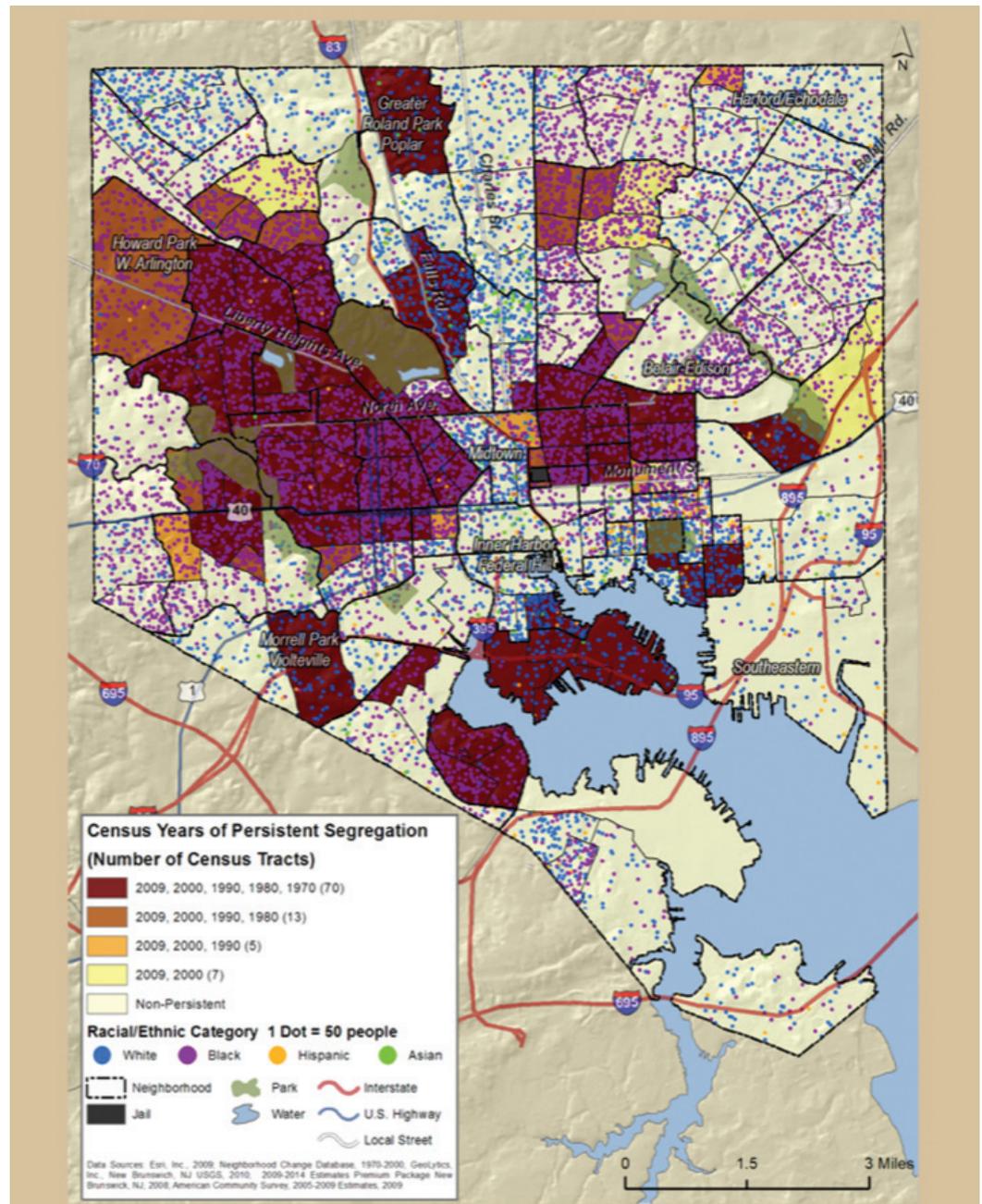
Census tracts that have been in persistent poverty for up to five decades are shown in Map 8. Here, too, previously redlined tracts tend to have experienced persistent poverty, with the exception of Inner Harbor. Between 1970 and 2009 in Baltimore, the entire neighborhoods of Penn North/Reservoir Hill, Perkins/Middle East, Sandtown-Winchester/Harlem Park, and Upton/Druid Hill meet the definition for persistent poverty.

Map 8:
Persistent Poverty by
Census Tract, City of
Baltimore (1970–2009)



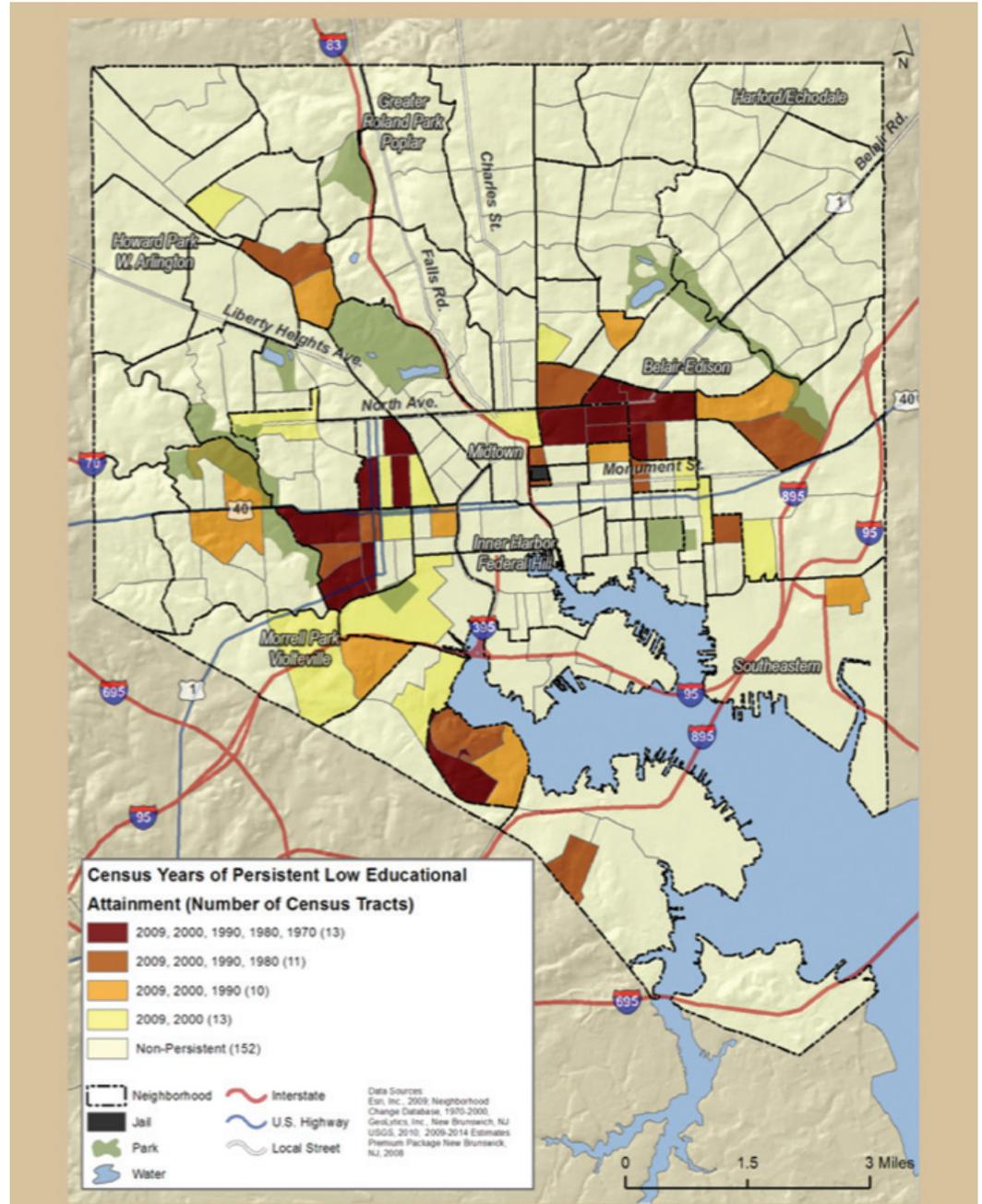
Persistent segregation is displayed in Map 9. The current racial/ethnic population is also shown as a dot density overlay in order to highlight which census tracts are currently majority White and which are majority Black. All of the census tracts that comprise South Baltimore have been at least 90% White since 1970; all of the tracts in Cherry Hill, Clifton-Berea, Dorchester/Ashburton, Forest Park/Walbrook, Greater Mondawmin, Greater Rosemont, Sandtown-Winchester/Harlem Park, and Upton/Druid Hill have been at least 90% Black for the past five census periods.

Map 9:
Persistent Segregation
by Census Tract, City of
Baltimore (1970–2009)



The census tracts of Baltimore that have been in persistent educational distress are illustrated in Map 10. This measure of distress seems to conform less with the redlined areas than do the previous measures, but the most affected tracts still surround the center city. The neighborhoods with low levels of college education were Clifton-Berea, Greenmount East, and Sandtown-Winchester/Harlem Park, where more than half of the tracts that comprise the neighborhood occupied the lowest quartile every decade since 1970.

Map 10:
 Census Tracts
 Persistently in the
 Lowest Quartile for Adults
 with a Bachelor's Degree,
 City of Baltimore
 (1970–2009)



In this section, we have explored the legacy of redlining on socioeconomic conditions over time and persistent racial segregation. Because redlining was in large part based on the existence of racial segregation in the 1930s, and because segregation and societal distress continue to be highly correlated, we cannot make assertions about the causes of geographic disparities in measures of distress in Baltimore. It is clear, nonetheless, that certain neighborhoods and census tracts in Baltimore have suffered from high levels of distress for many decades. The likely effect of redlining is perhaps most apparent in the relatively low levels of home ownership in previously redlined census tracts. Although our analysis did not show statistical differences in the likelihood of segregation or educational distress at a high confidence level, this may be in part due to our definitions of distress. Comparing areas on the basis of lower education attainment such as adults lacking a high school diploma, or single racial categories that exceed 70% or 80% of the population, may provide some insight into the impact that redlining had in these metrics of distress. In the next section, we look at contemporary housing and neighborhood conditions in Baltimore and the relationship of these conditions to crime and life expectancy.

Part III. Neighborhood Quality and the Educational Environment and their Relationship to Health

Housing and Neighborhood Characteristics

Previous studies have documented the relationship between housing quality and health outcomes. Housing units that expose residents to mold, pests, lead, or dangerous environmental conditions such as extreme cold or heat have detrimental effects on health.⁶⁶⁻⁷² As noted in the previous section, neighborhood characteristics can also affect health.

The co-occurrence of several less desirable community characteristics may have a compounded detrimental impact on well-being and health. To sum up the risks associated with housing and neighborhood conditions, we used data reduction methods to develop a risk index in order to estimate the comparative level of risk in Baltimore neighborhoods. We statistically combined the risk measures listed below to create a risk score for each census tract (see Appendix A for details):

- The rate of electricity shutoff due to a failure to pay, per housing unit
- The rate of pest complaints (rodents or insects) per housing unit
- The rate of lead violations per housing unit
- The density of vacant buildings and lots per square mile
- The ratio of liquor stores per person
- The percentage of households that do not own their home

The analysis resulted in the creation of two risk indices: The first index includes electricity shutoffs, pest complaints, and lead violations, and the second includes the vacancy rate, liquor stores per capita, and home ownership. We will refer to the first index as the Housing Risk Index (HRI) and the second as the Neighborhood Risk Index (NRI). For the HRI and the NRI, higher values indicate greater levels of distress (a higher HRI indicates higher rates of electricity shutoffs, pest complaints, and lead violations, and a higher NRI indicates a higher rate of vacant buildings/lots, liquor stores, and percentage of people who do not own their home).

Baltimore neighborhoods with the highest level of housing distress, as measured with the HRI, were located in Clifton-Berea, Greater Rosemont, Greenmount East, Madison/East

End, Patterson Park North and East, Pimlico/Arlington/Hilltop, and Southwest Baltimore. In each of these neighborhoods, more than half of the census tracts had an HRI score that was in the highest quintile for Baltimore.

The neighborhoods of Downtown/Seton Hill, Greater Charles Village/Barclay, Greenmount East, Perkins/Middle East, Sandtown-Winchester Harlem Park, Southeastern, Southwest Baltimore, and Upton/Druid Hill exhibited the highest amount of neighborhood distress as measured with the NRI. More than half of the tracts in these areas had scores that were in the highest quintile for Baltimore. When compared with the findings of our analysis of persistent distress in the previous section, small areas within Sandtown-Winchester/Harlem Park and Upton/Druid Hill consistently exhibit characteristics of risk and distress as defined by this report.

We examined how the NRI and HRI correlated with data from the Neighborhood Inventory for Environmental Typology (NifETy).⁷³ The NifETy data, representing all residential neighborhoods in the city of Baltimore, are gathered by using visual surveys of blocks to quantify the presence or absence of undesirable community characteristics. Areas that have a higher prevalence of undesirable neighborhood conditions (such as broken windows, loitering, or graffiti) result in higher NifETy scores. The following scores are produced from the NifETy data:

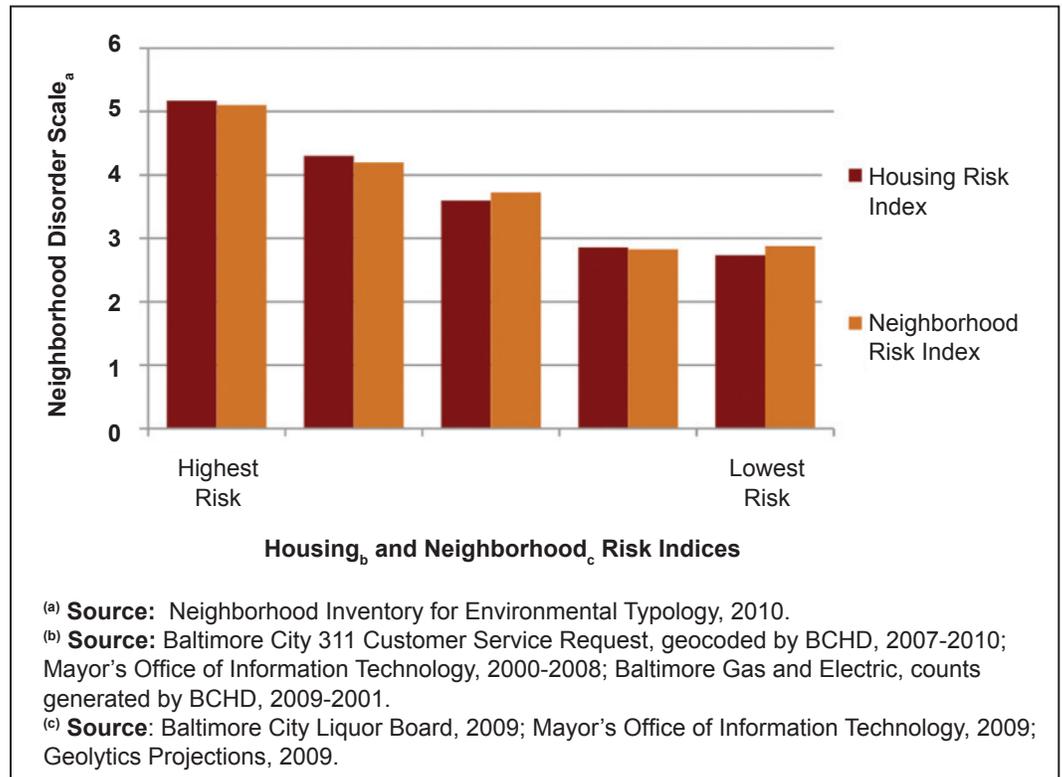
- **Alcohol score:** presence of alcoholic beverage bottles, broken bottles, persons consuming alcohol, and intoxicated persons.
- **Drug score:** presence of syringes, baggies, vials, blunt cuts/wrappers, pot roaches, and persons using and/or selling drugs.
- **Alcohol and Drug score:** the sum of the Alcohol and Drug scores.
- **Violence score:** presence of blood, shell casings, police tape/outlines, memorials, yelling, swearing, and fights.
- **Disorder score:** presence of structures with broken windows, unboarded abandoned buildings, unmaintained property, trash in open spaces, broken bottles, graffiti, noise, people yelling, public alcohol consumption, drug paraphernalia, and discarded alcoholic beverage bottles.⁷⁴

Analysis of the relationship between NifETy values and the HRI and NRI without controlling for any other variables demonstrated a statistically significant relationship with all NifETy measures.

- The NifETy Disorder score had the strongest relationship to both the HRI ($r = 0.65$, $P < 0.0001$) and NRI ($r = 0.59$, $P < 0.0001$).
- Both indices were more correlated with the Alcohol score (HRI: $r = 0.53$, $P < 0.0001$; NRI: $r = 0.51$, $P < 0.0001$) than with the Drug score (HRI: $r = 0.49$, $P < 0.0001$; NRI: $r = 0.41$, $P < 0.0001$).
- The Violence score had the lowest correlation but the association was still moderately strong (HRI: $r = 0.41$, $P < 0.0001$; NRI: $r = 0.40$, $P < 0.0001$).

The relationship between the HRI/NRI scores and the NifETy Disorder score is illustrated in Figure 6. We split census tracts into quintiles (five equal groups) on the basis of their HRI and NRI score and calculated the average Disorder Score for these groups of tracts. Census tracts with the highest HRI score had an average Disorder score that was 89.2% higher than in tracts with the lowest HRI score. The average Disorder score was 77.3% higher for tracts with the highest NRI score as compared with tracts with the lowest NRI score. These correlations provide support for the validity of the HRI and NRI as measures of community risk.

Figure 6:
Neighborhood Disorder by
Housing and Neighborhood
Risk, City of Baltimore
(2000-2010)



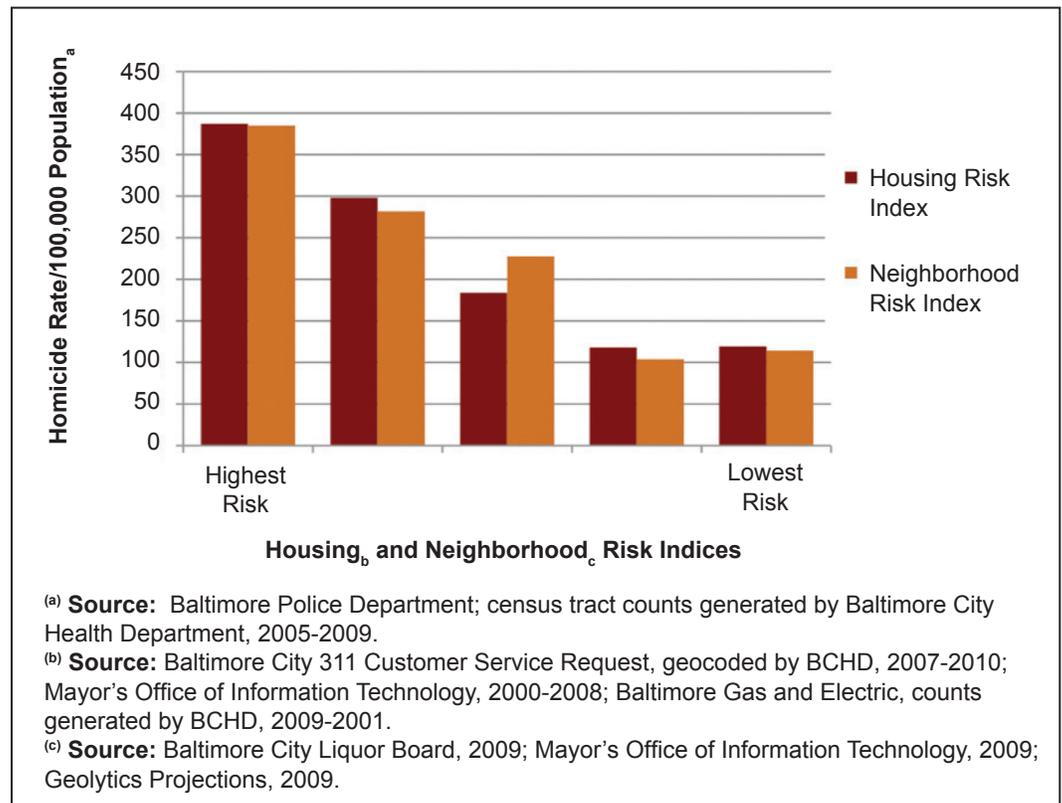
Housing and Neighborhood Characteristics and Crime

Previous studies have suggested that the level of housing and neighborhood risk in a community is predictive of the crime rate. For example, neighborhoods with high concentrations of vacant buildings⁷⁵ and liquor stores⁷⁶ tend to have higher crime rates, whereas childhood exposure to lead is associated with higher arrest rates in early adulthood.⁷⁷

In Baltimore, we found that at the census-tract level, neighborhood or housing risk correlated with homicide and nonfatal shooting rates. Bivariate correlation coefficients (that calculate the strength of relationship between two variables without controlling for any other variables) indicate that homicide and nonfatal shooting rates at the census-tract

level were significantly correlated with the HRI ($r = 0.65$, $P < 0.0001$) and NRI ($r = 0.62$, $P < 0.0001$). This relationship is illustrated in Figure 7: Grouping Baltimore census tracts into quintiles (five equally sized groups) according to their HRI and NRI scores demonstrates the highest homicide rates in the census tracts with the highest risk index scores. Homicides in census tracts with the highest HRI were more than three times as common as in tracts with the lowest HRI. The same homicide ratio was observed in tracts with the highest NRI.

Figure 7:
Homicide Rate by
Housing and Neighborhood
Risk (2000-2010)



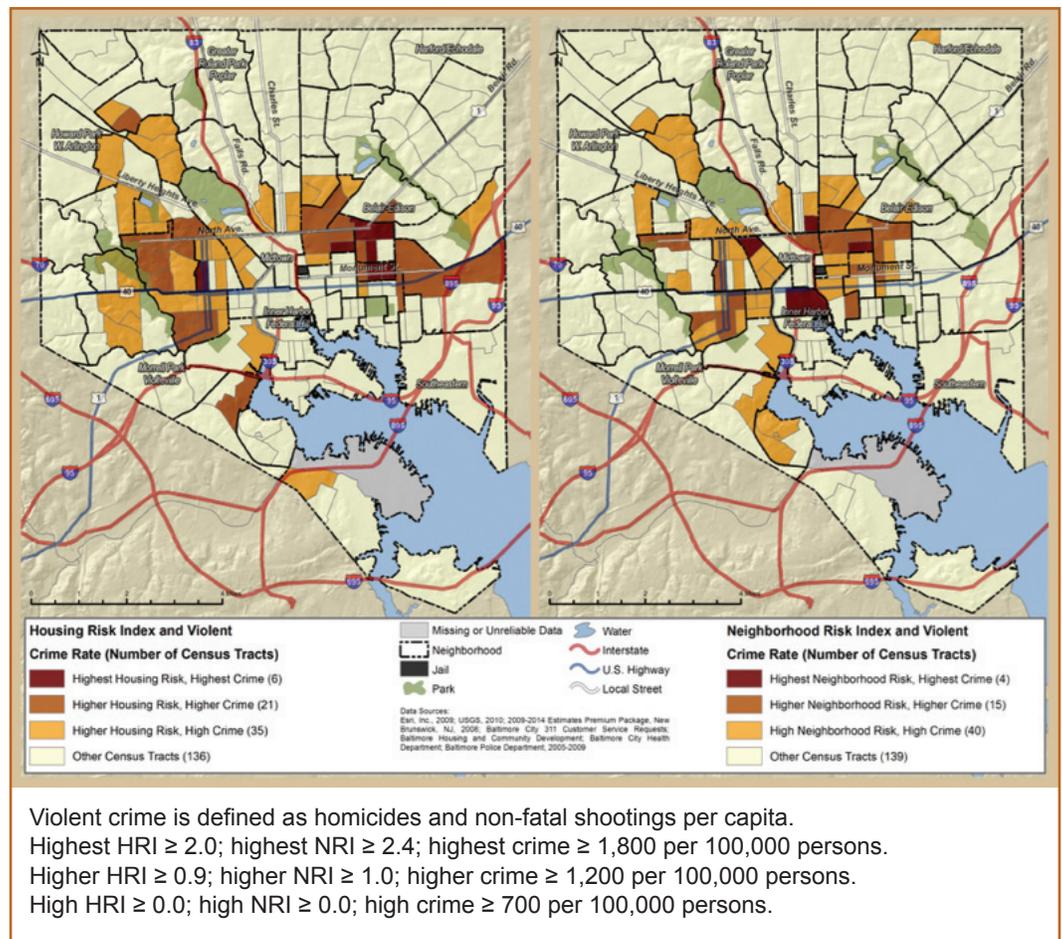
In order to estimate the independent effects that housing and neighborhood risk exert in relation to crime, controlling for other potentially confounding factors, we conducted a multivariate linear regression predicting the homicide/nonfatal shootings rate. The results show that both the HRI and the NRI have a statistically significant relationship with the violent crime rate by census tract even after controlling for the composition of the census-tract population by gender, race, ethnicity, educational attainment, median income, and age. Taken together, all of these characteristics are highly predictive of the violent crime rate in Baltimore (adjusted $r^2 = 0.72$) (see Appendix A for details).

Although these results suggest that high HRI and NRI scores tend to occur in neighborhoods with high violent crime rates, the spatial distribution of these distressed tracts is also an important consideration. Distressed tracts that are clustered together spatially into one large enclave augment isolation from other nondistressed tracts because opportunities for interaction are decreased.³⁰ In order to investigate the tendency of these distressed

tracts to cluster, we conducted a spatial autocorrelation analysis between the HRI and NRI and the rate of homicides/nonfatal shootings. The results revealed a moderately strong tendency for clustering among census tracts with high crime rates and both high HRI (Moran's I = 0.43, P < 0.05) and high NRI (Moran's I = 0.41, P < 0.05) values. The tracts that appear to cluster in this fashion—high risk with high crime—are displayed in Map 11.

The areas with the highest co-occurrence of the HRI and homicides/nonfatal shootings are Greater Rosemont, Clifton-Berea, Madison/East End, and Perkins/Middle East. Downtown/Seton Hill, Perkins/Middle East, Upton/Druid Heights, and Greater Charles Village/Barclay have the highest co-occurrence of homicide/nonfatal shootings rate and neighborhood risk.

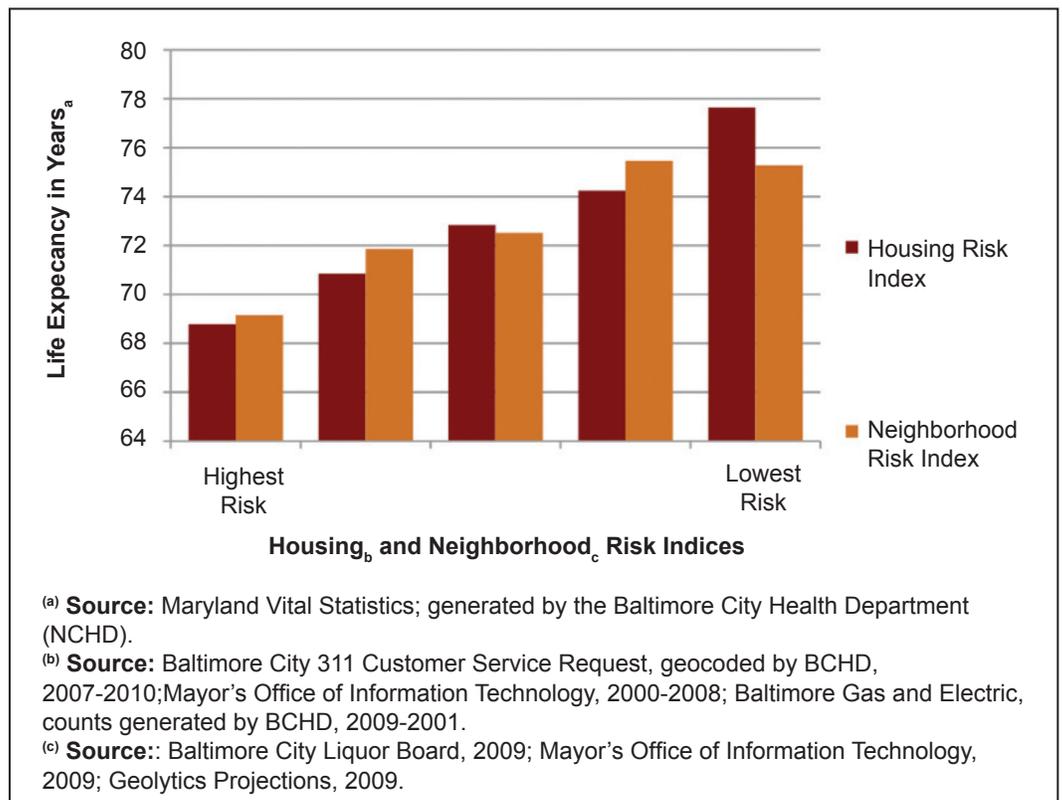
Map 11:
Co-Occurrence of
High Risk Score and
Homicide/Nonfatal Shooting
Rate, Baltimore (2009)



Housing and Neighborhood Characteristics and Life Expectancy

As noted earlier, the literature establishes the important health consequences associated with unhealthy housing and neighborhood characteristics.^{66-69,71} Risks are induced not only by exposure to lead, rodents, or allergens in the home but also by exposure to unhealthy conditions in the neighborhood, ranging from inadequate sources of nutritious foods and physical activity to overexposure to liquor stores, tobacco, and crime. Neighborhood exposures affect residents not only in their risk of violent injuries or death but also in the level of stress exerted on social cohesion and public safety. In Baltimore, we also found a striking association between the housing and neighborhood index and life expectancy itself. Life expectancy at the census tract level is significantly correlated with both the HRI ($r = -0.52$, $P < 0.0001$) and the NRI ($r = -0.43$, $P < 0.0001$), without controlling for any other variables. Grouping census tracts by quintile (five equally sized groups) according to values of the HRI and the NRI, we found that the average life expectancy in census tracts in the lowest HRI quintile was 8.9 years longer than the average life expectancy in census tracts in the highest HRI quintile. Life expectancy in the quintile with the lowest NRI scores was 6.1 years longer than that in the quintile with the highest NRI scores.

Figure 8:
Life Expectancy by Housing
and Neighborhood Risk,
Baltimore (2000-2010)



In order to investigate the independent effects of the HRI and NRI on life expectancy at the census-tract level, we conducted a multivariate linear regression analysis that controlled for the composition of the census tract in terms of gender, race, ethnicity, educational attainment, median income, and age. The model was highly predictive of life expectancy (adjusted $r^2 = 0.70$) in Baltimore, and both the HRI and the NRI remained statistically significant even after controlling for the other variables. The correlations for both the HRI and the NRI were negative, indicating that as housing or neighborhood risk increases, life expectancy tends to be shorter (see Appendix A for details).

Educational Opportunity

Low educational attainment or achievement can affect well-being in a variety of ways. For example, in 2010 the national unemployment rate for adults without a high school diploma was nearly three times higher than for those with a Bachelor's degree.⁷⁸ Similarly, the poverty rate in 2009 was more than 10 times higher for those without a high school diploma as compared with those with at least a Bachelor's degree.³⁵

Education is also tightly linked with health metrics. In 2009, compared with adults with a Bachelor's degree, adults in the United States without a high school diploma were four and half times more likely to be in fair or poor health, had more than twice the prevalence of diabetes, and had a higher likelihood of being hospitalized.⁴⁵ In addition, they were more than six times more likely to be uninsured, almost three times more likely to lack a usual source of care, and three times more likely to forgo medical care because of cost.⁷⁹

The spatial distribution of educational attainment in Baltimore was shown in Map 4. Proficiency scores (scores on standardized tests designed to reveal the level of skill on a particular subject of a student) also vary significantly by place in Baltimore. In 2009, 39.5% of third grade students attending school in Patterson Park North and East scored below basic proficiency (indicating insufficient mastery of basic skills) in reading tests—the highest of any CSA in Baltimore. Patterson Park North and East also had the highest percentage of 8th graders scoring below basic (49.6%) in reading tests. Conversely, in Greater Roland Park/Poplar and Mount Washington/Coldspring, zero third graders scored below basic, and in North Baltimore/Guilford/Homeland, 10.3% of 8th graders scored below basic in reading, the lowest percentage of all Baltimore CSAs.

Absenteeism among students is also a significant problem. Students cited for chronic truancy are at a higher risk of more serious forms of delinquency,⁸⁰ such as substance abuse, gang involvement, and criminal activity in adulthood.⁸¹ Absenteeism also increases the likelihood of dropping out of school before graduation.⁸² There is evidence that absenteeism in the early years of education is more damaging than in later years.⁸³ According to data we obtained from the Baltimore City Public Schools, the CSA with the highest rate of absenteeism among elementary school students was Perkins/Middle East,

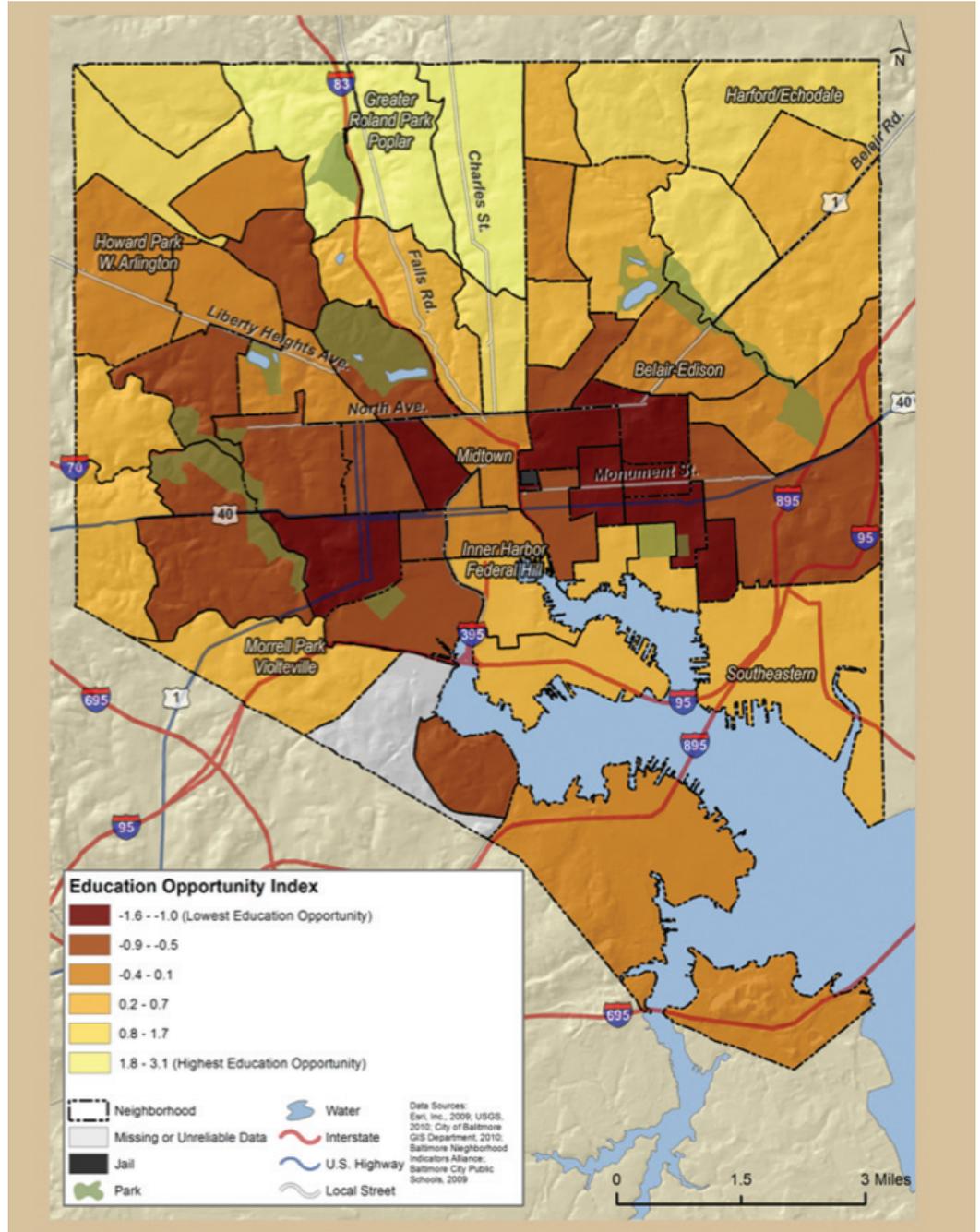
where 17.1% of students attending school in that CSA missed 20 days of school or more. Absenteeism among older students was greatest in Madison/East End, Highlandtown, and Jonestown/Oldtown, where more than half of high school students missed at least 20 days of school. Conversely, only 1.0% of Greater Roland Park/Poplar elementary students and 7.8% of high school students missed this amount of school, the lowest rates in the city.

To sum up the risks associated with educational attainment, proficiency, and absenteeism, we used data reduction methods to develop an Education Opportunity Index (EOI). We used the EOI to estimate the comparative level of risk related to education variables in Baltimore neighborhoods. We statistically combined the risk measures listed below in order to create a risk score for each CSA in Baltimore (see Appendix A for details):

- Percentage of the adult population (age 25 years and older) with a Bachelor's degree (2009)
- Percentage of elementary school students who missed less than 20 days of school (2009)
- Percentage of middle school students who missed less than 20 days of school (2009)
- Percentage of high school students who missed less than 20 days of school (2009)
- Percentage of 3rd grade students who scored at least basic proficiency in reading (2009)
- Percentage of 8th grade students who scored at least basic proficiency in reading (2009)

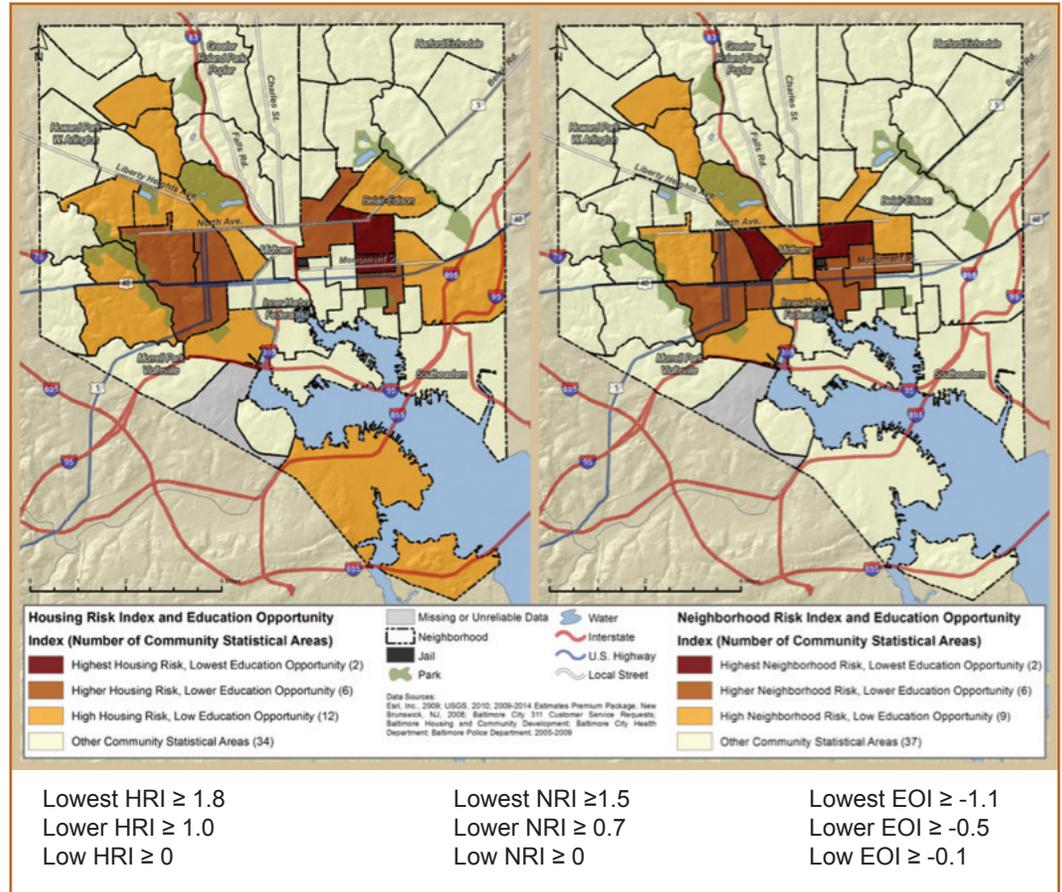
Higher EOI values are indicative of a better educational environment—a greater percentage of adults with Bachelor’s degrees, lower absenteeism rates, and fewer students scoring below basic on proficiency tests. The CSA with the highest EOI score was Greater Roland Park/Poplar. The lowest scores were in Madison/East End, Upton/Druid Heights, and Patterson Park North and East. The spatial distribution of the EOI in Baltimore for 2009 is illustrated in Map 12.

Map 12:
Educational Opportunity
Index by Community
Statistical Area, City of
Baltimore (2009)



We found that the EOI is strongly correlated with both the HRI ($r = -0.65, P < 0.0001$) and the NRI ($r = -0.55, P < 0.0001$), indicating that the same areas that exhibit unfavorable housing and neighborhood characteristics also tend to have low education metrics as well. The areas of Baltimore where high scores HRI and NRI scores co-occur with low EOI scores are highlighted in Map 13.

Map 13:
Co-Occurrence of High Housing and Neighborhood Risk Factors with the Educational Opportunity Index, Baltimore (2009)



The CSAs where the highest housing risk co-occurs with the lowest education scores are in Clifton-Berea and Madison/East End. The highest neighborhood risk co-occurs with the lowest education scores in Upton/Druid Heights and Greenmount East.

The EOI was highly correlated with several health metrics, the most striking being life expectancy. Life expectancy had the strongest bivariate correlation (not controlling for any other factors) with the EOI ($r = 0.76$, $P < 0.0001$). Other health and community metrics significantly correlated with the EOI were the rate of drug-induced deaths ($r = -0.66$, $P < 0.0001$), HIV/AIDS mortality ($r = -0.61$, $P < 0.0001$), and homicide mortality ($r = -0.66$, $P < 0.0001$). These relationships are illustrated in Figures 9 and 10. The average life expectancy in CSAs with the highest educational opportunity is 8.6 years longer than in CSAs with the lowest EOI. The risk of death from drugs or homicide is more than three times higher—and HIV/AIDS mortality is more than four times higher—than in CSAs with the highest educational opportunity.

Figure 9:
Life Expectancy by
Education Opportunity,
Baltimore (2005-2010)

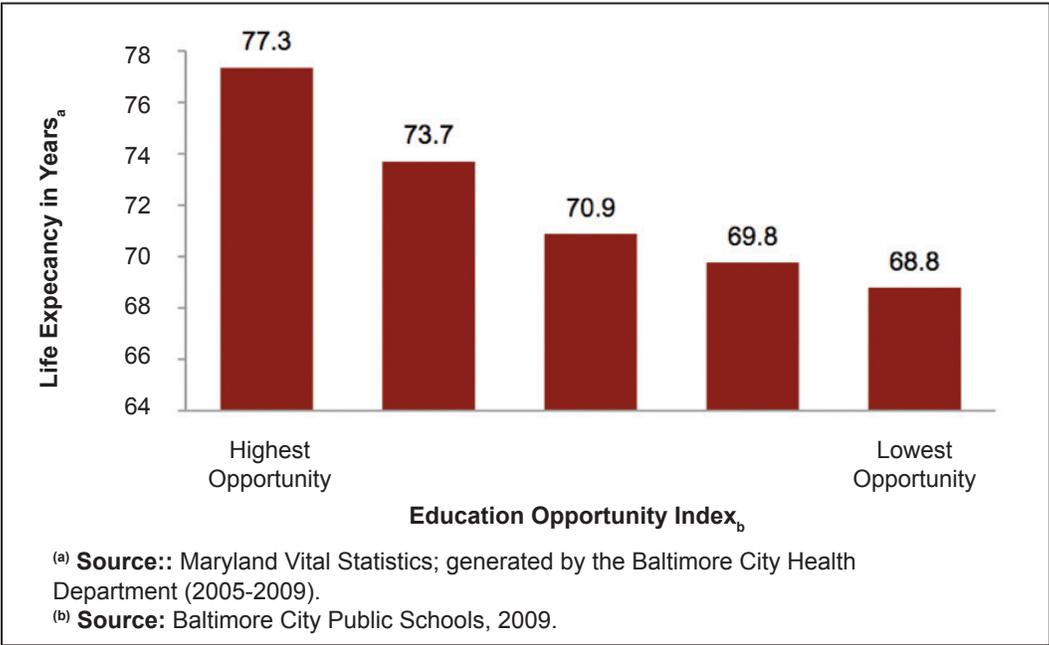
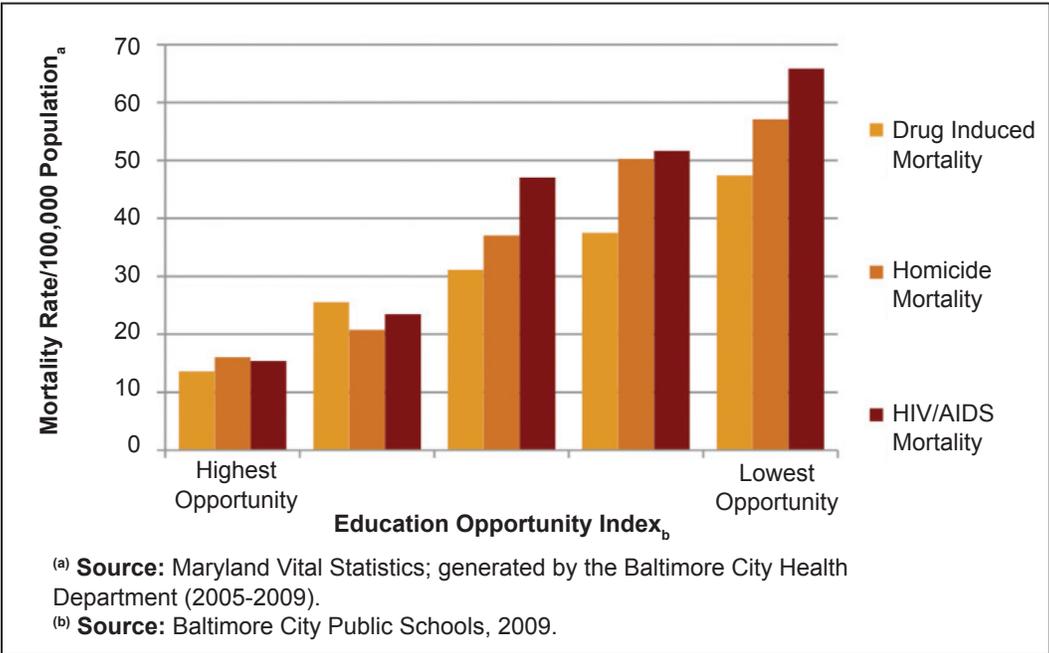
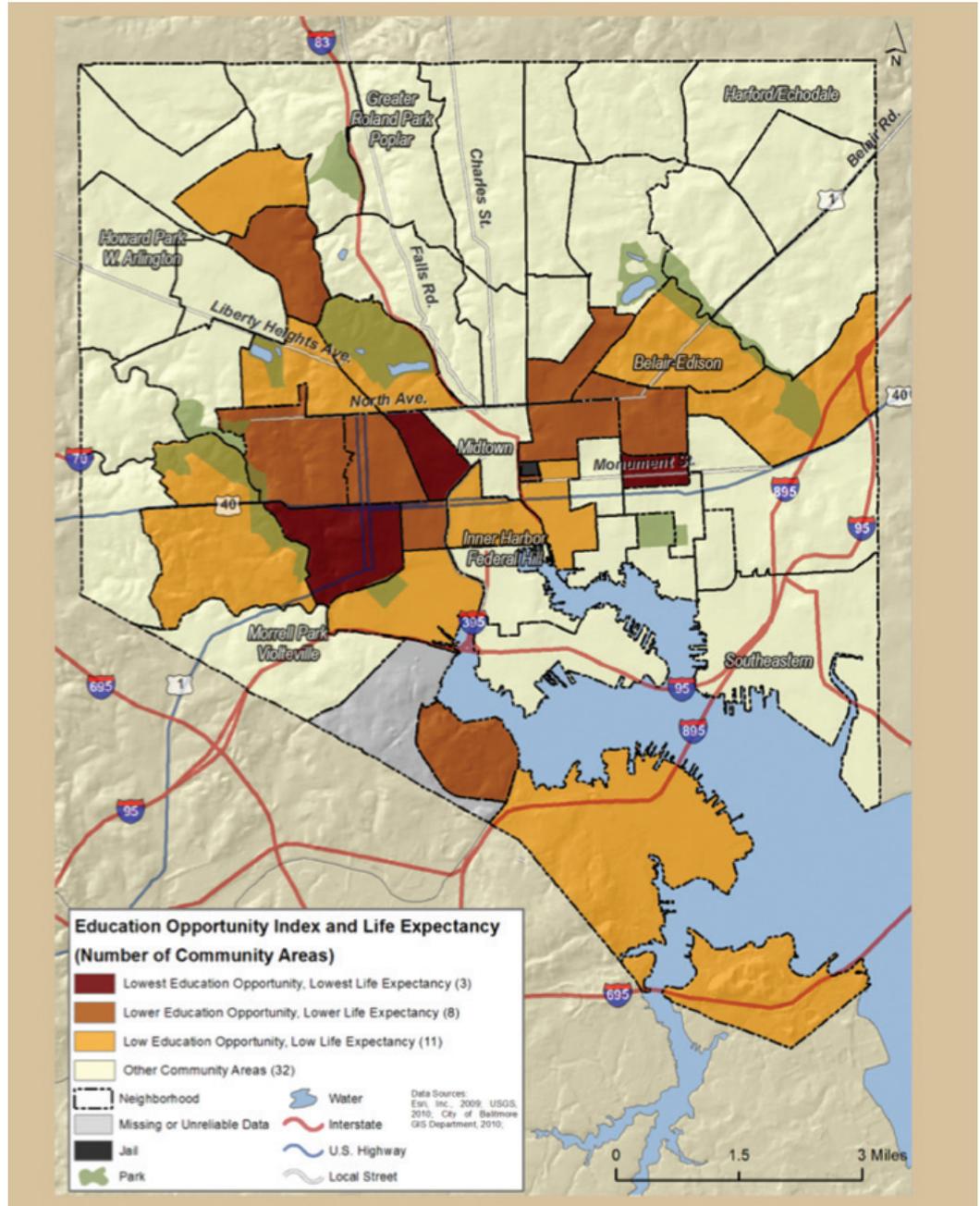


Figure 10:
Mortality by
Education Opportunity,
Baltimore (2005-2009)



CSAs with low educational opportunity and lower life expectancies have a moderately strong tendency to cluster together (Moran's $I = 0.36$, $P < 0.05$) rather than disperse randomly throughout the city. The areas where low educational opportunity and low life expectancy appear to cluster in one area are displayed in Map 14. The CSAs where the lowest educational opportunity and the lowest life expectancies co-occur are in Madison/ East End, Southwest Baltimore, and Upton/Druid Heights.

Map 14:
Co-Occurrence of Low Educational Opportunity and Low Life Expectancy, City of Baltimore (2009)



Part IV. Conclusions

We found evidence that risk related to housing quality, neighborhood conditions, and educational opportunity are predictive of crime, adverse health outcomes, and shorter life expectancy in the neighborhoods of Baltimore. The HRI and the NRI exhibited statistically significant relationships with life expectancy and homicide/nonfatal shooting rates independent of other known social, economic, and demographic factors in health. Better educational opportunities tended to correlate with longer life expectancy at the CSA level. Educational opportunity and housing/neighborhood risk also have a strong relationship with each other, indicating that tracts with high levels of risk often have a low level of educational opportunity, potentially producing a compounded adverse effect on health outcomes. Because of the cross-sectional nature of the data and other important limitations (such as lack of individual-level data), we cannot estimate the extent to which these factors have a causal relationship to the outcomes studied; however, we have found that neighborhoods with high levels of housing/neighborhood risk and/or low educational opportunity along with poor health outcomes tend to cluster together rather than being randomly dispersed throughout the city and that many of these associations have the dose-response relationship seen in causal relationships.

In 2009, Baltimore was the 13th most segregated major metropolitan area in the United States in terms of Black\White segregation.⁴⁴ The historical legacy of redlining in the 1930s may still be exerting a lingering effect on life in Baltimore because those exclusionary policies continue to shape the demographic composition of Baltimore's communities, especially patterns of home ownership and segregation. Areas with a history of protracted social and economic distress are of particular concern. The perpetuation of concentrated poverty, racial segregation, low home ownership rates, and poor educational attainment will likely foster undesirable social and health outcomes for both the near and longer term.

Areas that exhibit a longitudinal pattern of distress are of particular concern. The perpetuation of future generations living in areas of concentrated poverty, racial or ethnic segregation, lack of material wealth, and/or poor educational attainment fosters undesirable social outcomes and compounds health effects. Areas of Cherry Hill, Clifton-Berea, Greenmount East, Sandtown-Winchester/Harlem Park, and Southwest Baltimore consistently exhibit characteristics of distress in comparison with the rest of the city over the past five decades. The average life expectancy in these areas between 2005 and 2009 is 67.2 years, which is more than five years shorter than life expectancy for the city as a whole during this time period.

Poor health and shorter life expectancy economically affects Baltimore not only by increasing health care costs but also by limiting the output of the workforce. Similarly, limited opportunity for educational success decreases the productivity of the workforce, a significant detriment in a knowledge economy. Understanding the ramifications of policy decisions does not change the reality of limited resources available for addressing all of Baltimore's goals, but a more holistic view of the consequences of every decision improves the chances of well-informed and well-crafted policy strategies.

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