Self-rated Health and Residential Segregation: Does Wellbeing Vary by the Predominant Racial/Ethnic Group in a Neighborhood?

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Abstract:

Despite recent declines, racial segregation remains a detriment to minority neighborhoods. However, existing research is inconclusive as to the effects racial segregation has on health. Some argue that racial segregation is related to poor health outcomes, whereas others suspect that racial segregation may actually lead to improved health for some minority communities. Even less is known about whether minority access to white neighborhoods improves health. We address these gaps with individual data from the 2010 Philadelphia Health Management Corporation's Southeastern Pennsylvania Household Health Survey and census tract data from the 2010 Decennial Census and the 2006-2010 American Community Survey. We implement logistic multilevel models to determine whether and how a resident's self-rated health is affected by the racial/ethnic segregation of their neighborhoods. Our key finding suggests that the effects of segregation on self-rated health depends on an individual's race/ethnicity, with blacks and Latino residents most likely to experience adverse effects. Particularly, minorities living in predominantly white communities have a significantly higher likelihood to report poor/fair health than they would in segregated minority neighborhoods. These findings make clear that access to white neighborhoods is not sufficient to improve minority health, fuller neighborhood integration is necessary to ensure all have health equity.

Key words:

Racial Segregation, Self-rated health, Multilevel modeling, Philadelphia

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Introduction

A decade ago, the health literature called for the development of a multilevel research framework that could better clarify the association of racial segregation with individual health outcomes.[1] Since then, hierarchical modeling has been widely used to explore if an individual's health outcomes are adversely associated with his/her neighborhood's racial segregation,[2, 3] which is a common belief among health researchers.[4, 5] However, the evidence in the past decade has been mixed. Some found that racial segregation is related to poor health outcomes,[2, 3] whereas others reported that racial segregation is beneficial to health, particularly for non-black minorities.[6, 78, 9] As White and Borrell suggested,[10] this disagreement may be, in part, due to the lack of meaningful understanding of the mechanisms through which segregation affects health outcomes and little attention to measuring the concept of segregation, as well as the insufficient discussions on non-black minorities.

Recent research on segregation and health has widely employed the hierarchical modeling approach to refine the effect of segregation on individual health outcomes.[3, 7, 11] Segregation has been treated as an external and independent determinant of health in this knowledge stream and relatively few studies tried to untangle the complex relationships between racial segregation and health. Though Boardman suggested that hierarchical modeling helps researchers to investigate the underlying pathways between environmental factors and individual health,[12] little research has adopted this perspective to answer the question of how an individual's race/ethnicity moderates the effects of neighborhood segregation on their health.[10] Do minorities who live in predominantly minority places have worse health outcomes and does this relation vary among racial/ethnic groups? Or, does a minority's residence in a predominantly white neighborhood predict improved health?

Related to the exploration of pathways, conventional segregation measures heavily rely on the evenness and/or isolation dimension of segregation, such as dissimilarity index and isolation index.[13] Recently, several scholars have adopted a typology approach to segregation in order to capture the variable presence of a specific race/ethnicity group.[14, 15] This approach may be more useful than the conventional measures of segregation as typologies disaggregate neighborhoods within segregated cities, allowing us to compare segregated minority neighborhoods from predominantly white neighborhoods or racially mixed neighborhoods. Through this, we can determine whether and how a resident's racial/ethnic background interplays with segregated condition of his/her neighborhood, which may in turn affect health.

Residential segregation has been driven by racial discrimination against minorities in the housing market and choice of neighborhoods[4] and the US history suggests that African Americans are the major victim of segregation.[16] Therefore, the majority of the literature on health consequences of segregation has focused on African Americans and little is known about how segregation affects other minorities' health. In the past three decades, Hispanics and Asians have grown rapidly in the US[17] and recent findings about the protective effect of segregation on health are from the studies based on these burgeoning racial groups.[6, 7, 18] To more thoroughly understand how minorities' health is associated with segregation, it becomes crucial to consider these minorities at the same time and to investigate if the mechanisms from segregation to health differ by race/ethnicity.

The goal of this study is to address these issues above by using the typology approach to segregation investigating whether the relationship between segregation and health could be moderated by individual race/ethnicity, particularly black, Hispanic, and Asian, with hierarchical modeling.[14, 15, 19] The subsequent sections are organized as follows: we will review the relation

of segregation to health and propose the research hypotheses of this study. We will then discuss data, measures, and methods used in this study, followed by the analytic results, discussion, and conclusions.

Background

According to Kramer and Hogue,[5] the adverse relationship between racial segregation and population health was first uncovered in 1950 when Yankauer reported that in New York City, the infant mortality rates for both white and black soared with the increase in the concentration of black.[20] However, in contrast to social scientists, health researchers had not paid much attention to this adverse association till 1990s[5] and the mechanisms through which racial segregation operates to affect health remain elusive.[10] In addition, previous studies of segregation and health have mainly focused on African Americans and relatively little is known about how segregation affects other non-black minorities' health. The past three decades have witnessed a dramatic change in the minority composition in the US due to the influx of immigration from Latin America and Asian.[17] While some hope this new racial diversity may lead to greater racial integration, others warn segregation has endured between racial groups.[21, 22] Hence, there is a different landscape of racial segregation, particularly in the US metropolitan areas, and the scope of the investigation on racial segregation and health should be broadened accordingly.

What are the potential explanations for the adverse relationship between segregation and health? First, racial segregation has been related to poverty concentration.[23] Recent studies find that the race/ethnicity-specific poverty rates and racial segregation jointly contribute to the spatially concentrated poverty.[24, 25] Explicitly, minorities that live in poverty are more likely to be segregated than their white counterparts. The poor minorities are exposed to an environment with reduced employment opportunities and increased likelihood of mismatch of jobs and

individual skills.[26] As a consequence, the interplay between racial segregation and poverty directly minimizes life chances and leads to negative health outcomes.[5] Second, related to the previous point, minorities in areas with high levels of racial segregation may have poorer social environments, such as higher crime and worse quality education than their white peers. As Link and Phelan argued,[27] these social conditions are the fundamental causes of diseases and may contribute to poor health outcomes directly.[4, 28] Third, racial segregation may be associated with political alienation and powerlessness[28, 29] and these factors would lead to relatively few resources being channeled into an area. As a result, predominantly minority neighborhoods are more likely to be neglected and lack infrastructure than predominantly white neighborhoods.[25, 30-32] The neglected environment potentially exposes local residents to multiple health risks and thus a negative association with health outcomes may be observed.[33] Strully, for example, found that health clinics with predominantly minority patients have insufficient access to vaccines in comparison to other places.[34]

The discussions above convey two important messages. On the one hand, to advance the literature on racial segregation and health, it is imperative to include other minority groups into analysis and to clearly examine the mechanisms that link segregation to health. On the other hand, the reasons for why segregation matters presume that segregation is bad for health for *all* residents in a neighborhood and fail to consider the potential differences across race/ethnicity groups: Many of non-black minorities are immigrants and their segregation experience should be qualitatively different from black.[35] This raises the question: does segregation mean advantage for some?

Non-black minority residents in racially homogenous neighborhoods have been found to have very close social ties, which suggests possible residual health benefits.[9, 36] Klinenburg's

study of the 1995 Chicago heat wave, for example, found that Hispanic communities had a lower death toll than other groups because these residents kept a close watch on one another.[37] Even in the UK, Bécares and colleagues found that the supportive networks between minorities in densely ethnic communities create a protective effect which may mitigate the negative health consequences resulting from racial discrimination.[8, 9] They find this protective effect is especially profound for non-black communities, namely for south Asian Indian and Bangladeshi communities. However, closer inquiries into the relation between segregated communities and better health are not conclusive. The benefits of living in minority communities have been found to be inconsistent at best.[11, 36] For example, Bécares and colleagues did not find a significant relation between ethnic density and improved self-rated health, whereas Subramanian et al. reported a positive association between segregation and poor self-rated health.[3, 8]

If living in segregated communities results in uncertain health benefits with the potential of serious detriment, does a minority's residence in predominantly white communities lead to better health? While segregation literature typically argues that access to white neighborhoods should improve a resident's conditions,[15, 26] existing work on health is divided: On the one hand, moving into white majority areas may lead to improved conditions including better access to recourses for minorities. On the other hand, a small minority population in a white community may still experience social isolation and corresponding health disadvantages due to a lack of the social connections.[36] Thus, while the literature makes it apparent that racial segregation has some negative effects on health, it is not clear which residents experience the worse health.

To address these issues, this study argues that the association between health and segregation should be associated with the race/ethnicity of a resident and their neighborhood. Insufficient integration of races leads to ill health. We propose the following two hypotheses

(H1): regardless of race/ethnicity, residents living in a neighborhood predominated by a certain racial/ethnic background have poorer health than those living in a mixed neighborhood. (H2) that minorities living in a neighborhood predominated by white will suffer from segregation more than their counterparts who live in a mixed neighborhood.

Data and methods

Data source: To test our hypotheses, we chose the Philadelphia metropolitan area as our study site given its high levels of residential segregation in contrast to other American metropolitan areas.[14] Though the past four decades have witnessed a significant decrease in racial segregation in the US, the Philadelphia metropolitan area is still featured with clear color lines.[16] To better understand how an individual's self-rated health may relate to neighborhood characteristics, we constructed a two-level dataset where individuals are embedded in their neighborhoods. Regarding the definition of neighborhood, we followed the suggestion by Cutler and colleagues[38] to use census tract as a proxy for an individual's neighborhood because census tracts are "separated by observable boundaries such as rivers, highways, or major streets" (p.460), which helps residents to perceive their living environment. The neighborhood census tract data comes from the 2010 summary file 1 (SF1) Decennial Census and the 2006-2010 American Community Survey (ACS).

The individual level data were drawn from the 2010 Philadelphia Health Management Corporation's (PHMC) Southeastern Pennsylvania Household health survey, a survey conducted biannually in five counties of the Philadelphia metropolitan area. The PHMC survey aims to collect information on individual health behaviors, health status, and health care utilization, as well as demographic and socioeconomic status. Using a stratified sampling frame and random-digit dialing methodology, the PHMC survey is representative of the population within the

survey area, and has been found to closely resemble demographic profiles of other data sources maintained by federal agencies, such as the Behavioral Risk Factor Surveillance System.[39] The PHMC data also provides the balancing weights that could be applied to multivariate analysis in order to adjust for the potential sampling errors.[40]

Measures: The dependent variable in this study is self-rated health (SRH), a powerful predictor for diseases or mortality[41] and widely adopted in health research.[42, 43] The respondents were asked to evaluate their health as poor, fair, good, very good or excellent. Their answers were further dichotomized into poor/fair (coded 1) and good/very good/excellent (coded 0), which is a conventional practice. Due to the binary nature of the dependent, the logit link function will be used in our multivariate analysis.

Other individual covariates include age, gender, poverty, race/ethnicity, marital status, employment status, and education attainment. Respondents reported their ages in years and we treated *age* as a continuous variable. Males and females were coded as 1 and 0 in *gender*, respectively, and those who lived under the federal poverty line were coded as 1 in *poverty*, otherwise 0. As for *race/ethnicity*, the PHMC classified respondents into non-Hispanic white (reference group), non-Hispanic black, Hispanic, and non-Hispanic other minorities. Three race/ethnicity dummy variables were included in the analysis. *Marital status* was categorized into four groups: single (reference group), married or living with a partner, widowed/divorced/separated (WDS), and other marital status. Five *employment statuses* were reported in the PHMC data, namely full-time employed, part-time employed, retired, other employment status, and unemployed (reference). *Educational attainment* was treated in a similar fashion. Those who did not complete high school were treated as the reference and the following

four achievements were analyzed as dummy variables: high school diploma, some college education, college education, and advanced degree.

For the neighborhood measures, we utilized 2010 SF1 Decennial Census data to establish a racial typology of neighborhoods and the 2006-2010 ACS was used to capture the socioeconomic conditions in a neighborhood. Specifically, our typology is adopted from Ellen's and compares different compositions of non-Hispanic whites, non-Hispanic blacks, and 'others' – including Hispanics and non-Hispanic Asians, and racially mixed people.[19] This typology articulates many assumptions inherent within the segregation literature of evenness. For mixed communities of non-white racial/ethnic groups, it assumes an upper limit of 50%, corresponding to dichotomous evenness measures of segregation. Neighborhoods which are predominately white, predominantly black, or predominantly some other minority group constitute places which are segregated. Given the small number of mixed communities within Philadelphia, we combined all possible combinations of mixed neighborhoods into one category of mixed neighborhoods to be used as a reference group. Please see Table 1 for the typology definitions.

[Table 1 Here]

The Ellen's version of this typology was intended for studying racial integration at the national level while our study is focused on a single metropolitan area, requiring some adjustments due to the difference in the local racial/ethnic breakdown.[19] Most notably, while the original version includes various categories to account for different mixed communities (e.g. mixed white and black) we reduced the number of types of mixed communities to one category. This was done because the Philadelphia metropolitan area has comparatively few mixed

neighborhoods, a testament to the area's high racial/ethnic segregation. More discussion on the differences of our typology to Ellen's is available upon request.

Regarding *socioeconomic conditions*, we extracted the following six variables and applied the principal factor analysis to them to generate a single standardized socioeconomic status measure: percent with college educated or greater (factor loading=0.761), percent married (0.908), percent unemployed (-0.752), percent living in poverty (-0.899), percent of female-head households (-0.894), and income per capita (0.942). The principal factor analysis results suggested that almost 75 percent of the variation among these variables were explained by just one factor and the composite score helped us to avoid multicollinearity. This approach is similar to that proposed by Sampson and colleagues.[44]

Analytic approach: The first stage of our analytic plan is to obtain descriptive statistics of the variables above for a basic understanding of the data and our research area. The second stage is to implement multivariate analysis. Given the two-level data structure and the binary dependent variable, the logistic multilevel modeling was employed to examine the hypotheses. The statistical specification of the full model can be expressed as

$$\eta_{ij} = \log(\phi_{ij}/1-\phi_{ij}) = \gamma_{00} + u_{0j} + \sum \gamma_{0l} w_{lj} + \sum \beta_{kj} x_{ijk}$$

,where η_{ij} is the log odds of reporting fair/poor SRH for the i^{th} respondent in the j^{th} neighborhood, ϕ_{ij} is the odds of reporting fair/poor SRH for the same person, γ_{00} is the intercept, and u_{0j} indicates the random effect across neighborhoods. γ_{0l} represents the association of w_{lj} (covariate l in the j^{th} neighborhood) with SRH, and β_{kj} is the relationship of x_{ijk} (feature k of the i^{th} respondent in the j^{th} neighborhood) with SRH. We first included only the individual covariates (x's) into the analysis and then added the neighborhood variables (w's) into the regression model. In order to better understand the mechanism between racial segregation and SRH, the cross-level

interaction between an individual's race/ethnicity and his/her neighborhood typology was considered. As several recent studies suggested,[12, 45] examining the cross-level interactions allows researchers to answer the question of how environmental factors get under the skin. In this study, the interplay between an individual's race/ethnicity and neighborhood segregation would be used to test the second hypothesis.

Results

The descriptive statistics of the variables used in this study were summarized in Table 2. Note that the mean values for the dummy variables could be interpreted as the proportions of those who were coded 1. Overall, 18 percent of the PHMC respondents reported poor/fair health, which is comparable with the number (15%) reported by the Centers for Diseases Control and Prevention.[46] The poverty and unemployment rates in the survey area were 9 and 8 percent, respectively. As for racial composition, the 2010 PHMC survey included 67 percent of non-Hispanic white, 23 percent of non-Hispanic black, roughly 6 percent of Hispanic, and 4 percent of non-Hispanic other minority groups. These figures closely matched to those reported by Census Bureau.[47] Regarding other individual characteristics, almost 10 percent of the respondents did not complete high school education, while more than 40 percent of the individuals had at least a college degree.

[Table 2 Here]

At the neighborhood level, 60 percent of the neighborhoods were predominantly white and 14 percent were predominantly black. About one quarter of the neighborhoods in the Philadelphia metropolitan area were mixed communities. The high percentages of predominantly white and black neighborhoods suggested that racial segregation remains an issue in Philadelphia despite the decrease in the past three decades.[16] As discussed in the previous section, the

socioeconomic condition of a neighborhood is a standardized factor score based on six social variables and thus, its mean and standard deviation were 0 and 1. The descriptive statistics and comparisons with other data sources suggest that the 2010 PHMC are reliable and appropriate for this study.

The multilevel logistic regression results were shown in Table 3 and the odds ratio for each covariate was reported. An unconditional model (without any covariates) was implemented to justify the use of multilevel analysis (results not shown but available upon request). The Chi-square value of the unconditional model was 1394.95 with a p-value less than 0.001, suggesting that the proportion of those who reported poor/fair SRH was not evenly distributed across neighborhoods and neighborhood features like segregation may play a role in explaining this phenomenon. Model 1 only included individual level covariates and the findings here largely corresponded to the SRH literature.[41] For example, age was positively associated with the likelihood of reporting poor/fair health. Specifically, every 1-year difference in age was related to 2.7 percent increase in the likelihood (1.027-1=0.027) of reporting poor/fair SRH. Males and residents living in poverty were also positively correlated with poor/fair SRH. Individual marital and employment status were both significantly associated with SRH. Regarding race/ethnicity, in contrast to non-Hispanic white, non-Hispanic black residents were 50 percent more likely to report poor/fair health and the likelihood to answer poor/fair SRH was more than double among Hispanic residents. Even for non-Hispanic other minorities, the disadvantage in contrast to white was also found.

Neighborhood typology and socioeconomic conditions were included in Model 2. Comparing with Model 1, the associations of individual level covariates with SRH did not change much, except for race/ethnicity and marital status. After accounting for neighborhood

typology and socioeconomic conditions, the disparities in SRH between non-Hispanic white and other minorities were reduced. The likelihood of reporting poor/fair SRH was reduced by almost 50 percent ((0.274-0.526)/0.526= -0.48) for non-Hispanic black and more than 25 percent ((0.777-1.051)/1.051= -0.26) for Hispanic. Despite the least reduction, the likelihood of reporting poor/fair SRH was dropped by more than 10 percent ((0.271-0.311)/0.311= -0.13) for non-Hispanic other minorities. However, somewhat surprisingly, neighborhood typology was not significantly associated with SRH, while socioeconomic conditions were negatively related to SRH. *Ceteris paribus*, a one unit increase in the socioeconomic condition score was related to more than 25 percent (1-0.727=0.273) decrease in the likelihood of reporting poor/fair SRH. The finding in Model 2 suggested that the neighborhood socioeconomic conditions could be used to explain, in part, why the gap in the likelihood of reporting poor/fair SRH between non-Hispanic white and other minorities exists. Further bolstering these results, when removing socioeconomic status from Model 2 (results not shown but available upon request), those residing in predominantly white neighborhoods are almost 20% less likely (Odds ratio=0.82) to report poor/fair self-rated health. This suggests that white neighborhoods have better socioeconomic conditions, with implications to their health. Moreover, it demonstrates that racial segregation and socioeconomic status are related. In Model 3, we further considered the interactions between race/ethnicity groups and the predominantly white neighborhood. For non-Hispanic black, those who lived in the predominantly white neighborhood were almost 90 percent more likely (1.864-1=0.864) to report poor/fair SRH than their counterparts who lived in other types of neighborhood. More importantly, in contrast to Model 2, the association between non-Hispanic black and SRH became non-significant, which suggested that the association in Model 2 may be driven by those non-Hispanic black who lived in predominantly white neighborhoods. The

similar pattern was observed for non-Hispanic other minorities. More explicitly, those who identified themselves as non-Hispanic other minorities and lived in the predominantly white neighborhoods were twice (1.984) as likely to report poor/fair SRH as those who lived in other types of neighborhood. The individual level association between non-Hispanic other minorities and SRH was non-significant in Model 3. Nonetheless, the findings for these two minority groups could not be applied to Hispanic as the interaction term in Model 3 was not significant and the individual level association of Hispanic and SRH remained. These findings supports earlier research which suggests that living within predominantly white neighborhoods does not improve health for minorities, as well as offering further evidence that racial segregation does have residual negative effects on health.[36] It should be noted that the odds ratios reported in Model 3 for other individual and neighborhood level covariates were fairly close to those reported in Model 2. That said, the inclusion of the interaction terms did not change other findings in Model 2, and the mechanism between neighborhood segregation typology and SRH was through an individual's race/ethnicity, particularly non-Hispanic black and other minorities. In the next section, we will discuss these findings.

Discussion

This study employed multilevel modeling and typologies of different racially segregated neighborhoods to explore how neighborhood residential segregation affects self-rated health. We revisit our hypotheses with the findings above. We first hypothesized that residents of any race/ethnicity background will have poorer health when living in a neighborhood predominated by a certain racial/ethnic group than living in a mixed neighborhood but we did not obtain evidence to support. While an individual's race/ethnicity does predict poor/fair self-rated health, we could not identify a significant and direct relation between residence in segregated minority

neighborhoods and poor/fair self-rated health. However, our second hypothesis was verified, the residence of black and other non-Hispanic minorities in predominantly white communities predicts poor/fair self-rated health. In other words, while living in a minority community has inconclusive effects onto self-rated health, being one of the few minorities in a mostly white area does predict poor/fair self-rated health. Without studying the interactions between individual race/ethnicity and neighborhood segregation, this would not be revealed.

These findings contribute to the literature of urban health by directly measuring the effects neighborhood segregation has on self-rated health. We find how segregation effects health is steeped in nuance. While residence in predominately minority neighborhoods does not predict poor/fair health, the interaction between neighborhood socio-economic conditions suggests that minorities still are suffering from systematic racial inequality from their neighborhoods which adversely affect health.[4, 27, 28, 34] Detrimental neighborhood effects on minority health due to racial segregation are especially visible for black and other non-Hispanic minorities who live in predominantly white areas. This finding supports past research which suspected that minorities in white areas may suffer from poorer health due to the isolating effects of localized discrimination.[8, 36]

This paper has several limitations. First, we were unable to categorize different types of mixed neighborhoods, limiting the discussion on the advantages or disadvantages of various mixed communities. Second, the PHMC covers only the Philadelphia metropolitan area, which has a relatively small Asian and Hispanic community. Future research should replicate our analysis in other regions of the US as well as internationally to determine how the effects of segregation vary in places with distinct racial/ethnic compositions. Third, future research should attempt to identify the mechanisms that explain the protective effects of non-black ethnic

communities in the literature, such as the tendency of ethnic enclaves/communities to self-segregate so as to maximize internal advantage.[8, 9, 48] Fourth, the cross-sectional nature of this study limits our ability to directly identify causal relationships between neighborhood segregation and self-rated health. Finally, using a different definition of neighborhood may generate different results, though census tract has been commonly used in exploring neighborhood effects.[49]

Several policy implications may be drawn from our findings. Given the evidence for our second hypothesis, the effects of segregation are not limited to minority places alone. Health policies need to be adopted which more aggressively target minority populations within segregated neighborhoods. More fundamentally, these findings reiterate the need for sustained efforts to racially integrate neighborhoods. Minority access to white neighborhoods alone is not sufficient to ensure improved health. Instead, the most viable path for health equity is through 'true' integration wherein neighborhoods are more evenly divided between racial/ethnic groups. Otherwise, minorities living in a segregated area may suffer most in contrast to their counterparts in a less segregated neighborhood. This necessitates an integration of health policies and housing policies to ensure needy communities are integrated and properly served by health providers.

Table 1: Typology of Neighborhoods by Race

Neighborhood Type	Definition
Predominantly White	At least 60 percent white; no minority group represents more than 20 percent
Predominantly Black	At least 50 percent is black; no more than 20 percent classified as other races
Predominantly Other	At least 50 percent are other races; no more than 20 percent classified as black
Mixed Community	No more than either 50 percent white, 50 percent black, or 50 percent other race

Table 2. Descriptive statistics for individual and neighborhood level variables

	Mean/percent†
Individual Level (n=9,983)	
Dependent variable	
Self-rated health (poor/fair=1, otherwise=0)	0.18
Independent Variable	
Age	52.93
Gender (Male = 1, Female =0)	0.34
Living in Poverty (yes=1, otherwise =0)	0.09
Race/ethnicity	
Non-Hispanic White (ref.)	0.67
Non-Hispanic Black	0.23
Hispanic	0.06
Non-Hispanic Others	0.04
Marital Status	
Single (ref.)	0.23
Married/living with partners	0.54
Widow/divorced/separated	0.22
Other marital status	0.01
Employment Status	
Unemployed (ref.)	0.08
Full time employed	0.44
Part time employed	0.11
Retired	0.24
Other employment status	0.13
Educational Attainment	
No high school diploma (ref.)	0.07
High school education	0.31
Some college education	0.21
College education	0.24
Advanced degree	0.17
Neighborhood Level (n=978)	
Segregation Typology	
Predominantly White	0.60
Predominantly Black	0.14
Predominantly Other	0.02
Mixed community	0.24
Socioeconomic status	
Socioeconomic conditions	0.00

† For dummy variables, the mean values represent the percents or proportions of the groups coded 1. Standard Deviations were not included in this table as they may not be interpretable for dummy variables. These figures available upon request.

Table 3. Odds Ratios for multilevel logistic regression of self-rated health with individual and neighborhood-level covariates

Variable	Model 1	Model 2	Model 3
Intercept	0.080***	0.071***	0.078***
Individual Level			
Age	1.027***	1.027***	1.027***
Gender (Male = 1, Female =0)	1.164*	1.171*	1.169*
Living in Poverty (yes=1, otherwise =0)	1.711***	1.613***	1.611***
Race/ethnicity (reference: White)			
Non-Hispanic Black	1.526***	1.274*	0.998
Hispanic	2.051***	1.777***	1.478*
Non-Hispanic Others	1.311*	1.271*	0.842
Marital Status (reference: single)			
Married/living with partners	0.837*	0.877	0.881
Widow/divorced/separated	1.155	1.171	1.176
Other marital status	1.173	1.195	1.221
Employment status (reference: unemployed)			
Full time employed	0.527***	0.534***	0.534***
Part time employed	0.712*	0.727*	0.728*
Retired	0.775	0.802	0.803
Other employment status	2.483*	2.483***	2.488***
Educational attainment (reference: no high school)			
High school education	0.760*	0.791*	0.790*
Some college education	0.636***	0.674***	0.676***
College education	0.329***	0.368***	0.368***
Advanced degree	0.299***	0.342***	0.338***
Neighborhood Level			
Predominantly White		1.114	0.972
Predominantly Non-Hispanic Black		0.814	0.901
Predominantly Other		0.838	0.853
Socioeconomic Status		0.727***	0.717***
Cross Level			
Black X Predominantly White			1.864**
Hispanic X Predominantly White			1.342
Other X Predominantly White			1.984**
Intercept Random Effect (Variance Component)	0.200	0.144	0.144
Log-likelihood	-12,779.64	-13,179.09	-12,933.70

***p≤.001; **p≤.01; *p≤.05

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