



Original article

Diagnostic accuracy of self-reported racial composition of residential neighborhood



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ABSTRACT

Purpose: To examine the diagnostic accuracy of self-reported measures of individuals' perceptions of the racial and ethnic composition of their communities with objective data (i.e., census) as the criterion standard and assess differences in concordance in subjective and objective measures of segregation by race and ethnicity.

Methods: We examined data from 943 adult community health center visitors in Suffolk County, New York to assess differences between self-reported racial composition of current neighborhood and 2010 U.S. Census data. A cross-sectional convenience sample was obtained; questionnaires were used to compare participant responses about the racial composition of their current neighborhood and their town of residence.

Results: Respondents who self-identified as white were more likely to self-report racial composition of their neighborhood consistent with 2010 Census estimates. Relative to census estimates, 93.1% of blacks overestimated the proportion of their current neighborhood that was black, and 69.8% of Hispanics overestimated the proportion that was Hispanic.

Conclusions: There were statistically significant differences between the participants' self-reported neighborhood racial composition and census data across race and ethnicity groups. Future studies are needed to validate self-reported measures of individuals' perceptions of the racial and ethnic composition of their communities to examine the association between individual segregation experience and health.

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Introduction

Suffolk County, New York is a large suburb of New York City with a population of approximately 1.5 million residents; 71.6% non-Hispanic white, 6.8% non-Hispanic black, 16.5% Hispanic, and 5.1% other [1]. The county has experienced some substantial demographic changes in the past decade; the nonwhite population increased by 41% between 2000 and 2010. Although Suffolk County is becoming more diverse, it is not becoming more integrated. Regardless of their income, blacks and Hispanics in Suffolk County tend to live in segregated communities [2], and these communities

tend to have higher poverty rates, lower median incomes, poorer schools, older housing stock, and lower home ownership rates [2].

Residential segregation is the physical separation of two or more groups into different neighborhoods. There is substantial evidence to demonstrate that place and environment (physical, built, and social) impact health [3–5], and research has documented associations between segregation and higher mortality and homicide rates, poor birth outcomes, cardiovascular disease, poor self-reported health, infectious diseases, and exposure to toxins [6–19]. These outcomes are thought to result from the negative effects of segregation on the social and material resources that promote health and from the increased exposure to social and physical environments that adversely affect health [20,21]. Segregation systematically and spatially contains some populations to areas with concentrated poverty, exposure to chronic stressors, and a landscape characterized by disinvestment and decay. While often just a few miles, there

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can be starkly different exposures to neighborhood aesthetics and resources [22,23]—including those that are thought to be fundamental determinants of health—money, knowledge, power prestige, and social support [24]. Thus, segregation is often isolation from opportunity and opportunity structures, which can have grave consequences on health over the life course.

The dissimilarity index is a common measure of segregation that ranges from 0 (perfect integration) to 100 (complete segregation) [25]. The dissimilarity index measures evenness and can be interpreted as the proportion of minority residents who would have to change census tracts in order for the population to be evenly distributed [26]. Based on 2010 U.S. Census data, the Suffolk County black-white dissimilarity index is 62 and the Hispanic-white dissimilarity index is 41. In other words, almost three-fifths of blacks and approximately two-fifths of Hispanics in Suffolk County would need to move out of their current neighborhoods and into predominately white communities to create integrated neighborhoods [27]. In 2010, for a U.S. city with a population of more than 100,000, on average, the black-white dissimilarity index is 57 and the Hispanic-white dissimilarity index is 48 [28], meaning that Suffolk County is slightly more segregated for blacks and less segregated for Hispanics than the average U.S. city.

Residential segregation is one of the many causes of racial disparities in health [16,29]; as such, residential segregation has become an important construct in health disparities research. Although much of the literature has used objective measures of segregation based on census data [7,9,14,15,30], others, similarly, have demonstrated that individual perceptions of segregation have an effect on health outcomes such as homicide, crime, and overall longevity [12,31–36]. There is a need to understand how accurately individuals' perceptions of their segregation experience within their environment reflects the environment as it is objectively described by data such as the U.S. Census. There are mixed results in the literature about the concordance of objective and subjective segregation measures [37–39]; this could be because an individual's segregation experience may differ significantly from that of their environment (i.e., an individual may attend a diverse school, but be in a segregated classroom) suggesting that difference between objective and subjective measures may be due to the unit of analysis and that both may have implications for health outcomes similar to the way both structural and personally mediated racism impacts health [40]. The development of measures to assess individuals' perceptions of the racial and ethnic composition of their communities is therefore needed to examine the relationship between segregation experience and health outcomes or status. We examined the diagnostic accuracy of a self-reported measure of racial composition of current neighborhood against 2010 Census data in Suffolk County, New York.

Methods

Study design and setting

Waiting room questionnaires were administered at three community health centers managed by the Suffolk County Department of Health Services (SCDHS), Division of Patient Care Services. The SCDHS is a safety net provider for the county with a network of eight family health centers located in minority and medically underserved communities. These centers provide comprehensive health care services to all residents in Suffolk County, accepting Medicaid and Medicare as well as other forms of insurance. Uninsured and underinsured residents are billed on a sliding fee scale based on their household income in relation to the federal poverty level. Study inclusion criteria required participants be at least 18 years old and able to speak and write in English. Trained data

collectors approached all adult visitors in the waiting rooms of the health centers. Data were collected between November 2009 and April 2010, on different days of the week and at different times of the day.

Sixty two percent of the people approached agreed to complete the questionnaire. Of the 1970 individuals that agreed to participate, 1519 (77.1%) completed the questionnaire, and 943 of those met study inclusion criteria and provided the information needed for the analyses conducted in this study. The primary reason for incomplete questionnaires was being called in for care before the questionnaire was complete. Respondents are primarily from the three towns in which the health centers are located ($n > 100$ for each). However, the sample has responses from 65% of the towns in Suffolk County. Of the 59 towns in our sample, 95% have at least four respondents.

This study was approved by the Stony Brook University Committee on Research Involving Human Subjects, the SCDHS Institutional Review Board, and the National Institutes of Health Office of Human Subjects Research. All participants completed a verbal consent process and received a written information sheet about the study before completing the questionnaire.

Racial composition measure

Respondents' self-report of the perceived racial composition of current neighborhood was assessed using an item adapted from the Behavioral Risk Factor Surveillance System [41] and the National Survey of Black Americans [12]. Participants were asked to check all that apply for the racial composition of their neighborhood (mostly, about half, and some) among three racial and ethnic groups (whites, blacks, and Hispanics). There was also a "not applicable" response option resulting in 10 possible response options. The racial composition measure assessed racial composition in six environments (junior high school, high school, neighborhood growing up, current neighborhood, place of employment, and place of worship). Neighborhood was not explicitly defined for participants, nor did we ask length of time residing in this neighborhood in this study. Participants were further asked to indicate their town of current residence. Racial composition by town (e.g., Amityville, Mastic Beach) was pulled from the 2010 U.S. Census and categorized into thirds ($<33\%$, $33\%–66\%$, and $>67\%$) to conceptually match with the survey question response options of mostly, about half, and some; Census data were linked to survey data by town.

Sample

Analysis is limited to respondents that self-identified as non-Hispanic white, non-Hispanic black, or Hispanic, with nonmissing responses to the racial composition question. Respondents' race and ethnicity were determined by their responses to two questions: (1) What is your ethnicity? (i.e., Hispanic, non-Hispanic) and (2) What is your race? (i.e., African-American or black, white, Asian or Pacific Islander, Native American, or other).

Statistical analysis

Data were analyzed using SAS/STAT software, version 9.3, for Windows (Cary, NC); statistical significance was assessed as P less than .05. A cross-sectional convenience sample of health center visitors responded to questionnaires that assessed self-reported perceived racial composition of their current neighborhood. We examined the concordance between self-reported racial composition of current neighborhood and objective racial composition of town from 2010 Census data (i.e., percentage of white, black, and Hispanic residents). Analysis for this study was performed in 2012.

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