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Segregation and cardiovascular illness: The role of individual and metropolitan socioeconomic status

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ABSTRACT

Demographic and epidemiologic research suggest that cardiovascular illness is negatively linked to socioeconomic status and positively related to racial residential segregation. Relying on 2005 data from the Behavior Risk Factor Surveillance Survey and the American Community Survey, this study examines how segregation and SES (individual and metropolitan) impact hypertension for a sample of 200,102 individuals. Multilevel analyses indicate that both segregation and hypersegregation are associated with hypertension, net of individual and spatial SES. While individual and metropolitan SES have independent effects on hypertension, these effects also differ across segregation type. In segregated and hypersegregated environments, highly educated and high-earning individuals seem to be protected against hypertension. In extremely hypersegregated areas, areas where there is very little interaction with non-black residents, SES does not have any protective benefit. These findings reveal that SES has differential effects across segregation types and that hypertension in disadvantaged (extremely hypersegregated) areas may be a function of structural constraints rather than socioeconomic position.

1. Introduction

Sociological and social epidemiological research on spatial inequality emphasizes how racial residential segregation and socioeconomic conditions influence health. Specifically, impoverished individuals of low socioeconomic standing may live in residentially segregated areas because of differential access to employment or educational opportunities. For this socioeconomically disadvantaged population, gaining employment or a degree could potentially propel them into higher levels of socioeconomic status (SES), and could provide opportunities to live in more racially and socioeconomically diverse areas (de Souza Briggs, 1997).

Moreover, residentially segregated areas and economically disinvested communities may be gatekeepers for health-promoting resources because of a lack of social infrastructure. Research has shown that segregated areas lack convenient access to stores (Zenk et al., 2005), places to exercise (Kaczynski et al., 2010) and quality health care facilities (Williams and Collins, 2001). In addition, segregated areas have been associated with a higher risk of exposure to crime and environmental hazards, which are sources of stress on a daily basis (Acevedo-Garcia et al., 2003). Because there are large variations in the degree of racial clustering in metropolitan areas, racial differences in health also tend to be more pronounced in segregated cities (Subramanian et al., 2005). In this manner, residential segregation not only exacerbates socioeconomic disadvantage but also geographically accumulates health-related risks for minority residents in these areas.

While the research on segregation and health is expansive, there are noticeable gaps that this research addresses. First, there is a paucity of research relating spatial inequality (vis-à-vis residential segregation) across metropolitan areas to socioeconomic inequality within those areas. At the individual level, social class and health (Adler et al., 1994), race and health (Williams and Collins, 2001) and race and social class (Oliver and Shapiro, 2006) are all inextricably linked, but the interconnectivity of these three key social indicators varies across space (Acevedo-Garcia et al., 2003). As such, this research uses geographic heterogeneity to explore how space plays a role in determining health among people of various socioeconomic and racial backgrounds.

Second, because poor socioeconomic conditions (e.g., supermarket access and quality health care facilities) and dangerous environmental conditions (e.g., crime and environmental hazards) are characteristic of segregated areas, it is unclear to what extent a person's own socioeconomic status and the socioeconomic environment in which one lives influences an individual's risk of being chronically ill. That is, could the potentially negative effects of living in an impoverished area be ameliorated by elevating a person's socioeconomic standing? The present study suggests that in some areas where there is extreme segregation, certain

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socioeconomic indicators (such as education) may not be as predictive of health as other indicators that are more proximately related to health care (such as income). Also, while higher levels of segregation are associated with poor health, it is uncertain if extreme types of segregation (i.e., hypersegregation) have differential effects on health or if the effects of hypersegregation on health are identical to those from living in segregated environments. Thus, it is necessary to determine whether there are differences in individual and metropolitan-level health risks in segregated versus hypersegregated areas (Massey and Denton, 1989; Wilkes and Iceland, 2004), where there is an almost exclusive interaction with members of one's own race.

Third, while it is assumed that segregation is negatively associated with all health outcomes, very few studies quantify the effect that segregation has on hypertension. These studies focus on racial differences in hypertension within segregated areas and assume there is socioeconomic homogeneity within segregated areas. Research on this topic suggests that whites and blacks have similar cardiovascular outcomes when they live in areas with similar levels of segregation (Thorpe Jr. et al., 2006), and higher rates of hypertension for both whites and blacks are associated with higher levels of segregation (Kershaw et al., 2011). One study finds that within the context of New York City, segregation is not associated with racial differences in hypertension (White et al., 2011), which suggests that not all segregated areas produce racial differences in hypertension. Because of the insufficiency of research on this topic, further evidence is needed to assess whether race, socioeconomic status, or both are key in understanding the role segregation has on hypertension diagnoses. Hypertension is an important health concern: it is a major risk factor for heart disease, stroke, congestive heart failure, and kidney disease (Kannel, 1996). Currently one-third of adults have been diagnosed with hypertension (Rabe-Hesketh and Skrondal, 2012).

The current study uses data from a large, nationally representative sample to answer these three questions. Specifically, this research explores whether living in segregated areas is predictive of hypertension, how socioeconomic factors at the metropolitan level are related to socioeconomic factors at the individual level in predicting hypertension, and whether a person's SES buffers hypertension differently depending on the type of segregated environment in which he or she lives. In this manner, different levels and kinds of segregation in metropolitan areas may be shown to produce differential effects from individual SES on whether a person will be diagnosed with having hypertension.

2. Background

2.1. Racial residential segregation and health

As a persistent feature in the US, residential segregation, or the extent to which two or more groups are physically separated in urban areas, is tied to poor health among African Americans (Williams and Jackson, 2005) through institutional racism, which is designed to protect whites from social interaction with minorities (Williams and Collins, 1995; Wilson, 1987). Further, the degree of residential segregation is much greater for blacks than for any other racial group (Massey and Denton, 1989). While individual dimensions of segregation have been tied to health, it is important to note that blacks also experience simultaneous high segregation across multiple dimensions of segregation (Osypuk and Acevedo-Garcia, 2008). The deleterious health effects of this kind of segregation, called hypersegregation, are less established in the literature. However, for both segregation and hypersegregation, related poor health outcomes range from disparities in engaging in risky behaviors such as smoking or drinking alcohol (Kramer and Hogue, 2009) to mortality (Eitle, 2009; Hearst et al., 2008).

It is important to disentangle segregation from hypersegregation for several reasons. First, methodologically, the two are composed of different measurements. Hypersegregation is defined as jointly high values on five segregation indices (evenness, exposure, centralization, clustering and concentration). Conversely, segregation is conventionally defined as lying on the numerical continuum of one or two segregation indices. Thus, areas can be quantified as having low or high levels of segregation, and areas can be typified as being hypersegregated.

Second, conceptually, segregation and hypersegregation present different social realities for individuals who reside in the areas. By definition, segregation is the separation of one group from another. In this research, segregation is further clarified by suggesting that it occurs racially within the context of where people live. Thus, racial residential segregation is the racial separation of one group in a particular residential area from another. The division between races is physical. In contrast, hypersegregation is defined as a "multidimensional character [istic]" (Massey and Denton, 1989: 389) whereby minorities are economically, educationally, environmentally, politically, residentially, and socially isolated from whites. Accordingly, there is an exclusive daily interaction with members of one's own race within hypersegregated locales. Thus, the division between races is extreme primarily because it is both physical and social.

Third, compositionally, black representation in segregated and hypersegregated metropolitan areas is distinctively different. Massey (2004) suggests that a majority of all blacks and a great majority of urban blacks experience high levels of residential segregation in metropolitan areas. Additionally, about half of all urban blacks and about 40% of all blacks experience hypersegregation, which is the kind of separation that mirrored South African apartheid (Massey, 2004). The compositional difference between segregated and hypersegregated areas is an important distinction because educational, health and social outcomes have been shown to be more detrimental for blacks in hypersegregated metropolitan areas than in segregated ones. Specifically, blacks in hypersegregated communities experience higher frequencies and more negative ramifications of school dropout (Williams and Collins, 2001), low birth weight (Osypuk and Acevedo-Garcia, 2008) and personal victimization (Eitle, 2009) than blacks in segregated communities. Thus, it is critical to compare segregated and hypersegregated metropolitan areas instead of treating them as the same phenomenon.

While researchers have linked segregation to health outcomes, the literature shows some inconsistency, as other research illustrates advantageous and race-based nuances to the relationship between segregation and health. For example, Smaje (1995) suggests that the concentration of minorities in areas may mean that there is a greater level of political empowerment and community integration, which are both associated with favorable health. In addition, LeClere et al. (1997) notes that in the National Health Interview Survey-National Death Index linked files, neighborhood characteristics such as ethnic concentration lowered the risk of mortality but only for particular ethnic groups such as Mexican Americans. As evident in these studies, the community's social content (i.e., how individuals in a community are organized and relate to one another) may be a protective factor for health.

Regardless, a plethora of research suggests that segregated environments are associated with deleterious health outcomes. These effects are concentrated in the spatial environment and are not artifacts of general racial differences in health. To illustrate, Fang et al. (1998) uncovered racial differences in health in racially concentrated areas. Independent of socioeconomic status, whites