



Racial and ethnic residential segregation and access to health care in rural areas



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ABSTRACT

This study examined the relationship between racial/ethnic residential segregation and access to health care in rural areas. Data from the Medical Expenditure Panel Survey were merged with the American Community Survey and the Area Health Resources Files. Segregation was operationalized using the isolation index separately for African Americans and Hispanics. Multi-level logistic regression with random intercepts estimated four outcomes. In rural areas, segregation contributed to worse access to a usual source of health care but higher reports of health care needs being met among African Americans (Adjusted Odds Ratio [AOR]: 1.42, CI: 0.96–2.10) and Hispanics (AOR: 1.25, CI: 1.05–1.49). By broadening the spatial scale of segregation beyond urban areas, findings showed the complex interaction between social and spatial factors in rural areas.

1. Introduction

To ensure equitable access to and utilization of primary and preventive care, addressing the potential challenges for rural populations in access to health care is an important concern. Though access to health care for rural populations is a priority for the National Academy of Medicine and the Agency for Healthcare Research and Quality (AHRQ), limited empirical work considers the role of social and contextual-level factors within rural areas that may help or hinder access and utilization of health care. We posit that in rural areas, residential segregation, defined as the geographic and social isolation of racial/ethnic minorities, is a key social factor that corresponds with disparities in access to health care.

Rural populations generally have higher morbidity and mortality rates relative to urban populations; individuals living in rural areas have fewer visits for preventive screenings, less access to specialists, and more preventable hospitalizations when compared to urban populations (Bennett, 2008, Chan et al., 2006, Laditka et al., 2009, Larson, 2006). Further, racial/ethnic minorities may face unique barriers in access to health care in rural areas. Depending on the outcome, there are mixed findings for whether African Americans and Hispanics in rural areas have less access and utilization of health care than their urban counterparts and rural non-Hispanic Whites (Bennett et al., 2012; Caldwell et al., 2016).

For generations, large concentrations of African Americans and

Hispanics have resided in the rural south or southwest, respectively, which reflect historical legacies of slavery, racial/ethnic oppression and changing national boundaries (Lichter et al., 2012; Burton et al., 2011). Nationally, while rural areas are composed of more non-Hispanic Whites, between 2000 and 2010, racial and ethnic minorities accounted for 83% of the rural population growth (Johnson, 2012). Settlement patterns, and clusters of both established and new racial/ethnic minority residents, are often easily recognizable in rural areas (Burton et al., 2011). The proportions of African Americans and Hispanics in rural areas overall may be lower than in urban areas, but estimates of residential segregation are estimated to be similar to urban areas (Lichter et al., 2007). In particular, rural areas characterized by high rates of growth of Hispanic populations may be highly segregated when compared to more established rural Hispanic areas (Lichter et al., 2010).

Segregation can perpetuate racial and ethnic disparities in health by restricting educational and employment opportunities, shaping physical and social characteristics of local areas, and concentrating poverty (Williams and Collins, 2001; Phelan and Link, 2015). Fewer studies examine how segregation contributes to racial and ethnic disparities in access to health care, despite inadequate access being associated with poorer health outcomes and unnecessary costs (LaViest et al., 2011). We expect that racial/ethnic minorities in rural areas will have restricted access to health care due to high levels of poverty and limited availability of health care resources. As racially/ethnically

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segregated communities tend to be low-income with restricted job and educational resources (Charles, 2003; Wilson, 1987), residents may have lower levels of access to health care when they live in areas with increasing levels of segregation. Specifically, higher concentrations of neighborhood poverty are negatively associated with reporting a usual source of health care and wellness visit (Litaker, 2005, Kirby and Kaneda, 2005). The problem may be worse in rural areas, where racial/ethnic minorities live in persistently poor areas (i.e. 20% or more of county is living in poverty continuously for the last 30 years); one-half of all African Americans and one-third of Hispanics are located in persistently poor areas, which are likely segregated from Whites and non-poor populations (Lichter and Johnson, 2007).

Another possible explanation linking segregation to access to health care are inequities in the local health care system and health care marketplace (Smedley et al., 2003). Similar to “white flight” in which neighborhoods transitioned from working class White to predominantly African American, there was also health care “White flight” in which providers and hospitals relocated to more affluent and mostly White suburban areas (Smith, 2005). More recently, Hispanic immigrants may have inherited a lack of services as they moved into predominantly African American neighborhoods (South et al., 2008). Current estimates show that high residential concentrations of African Americans are associated with public hospital closures and fewer primary care physicians (Ko et al., 2013; Gaskin et al., 2012). When health care is more segregated, minorities receive less health care and lower quality care when compared with Whites (Smith et al., 2007; Merchant et al., 2011). For rural areas, these experiences may be heightened, with more than 65% of rural counties being whole or partial Health Primary Shortage Areas, a designation used to increase the number of health professionals practicing in an area. In rural counties, Health Primary Shortage Areas are more likely to be in counties in which Hispanics and African Americans are the majority (Probst et al., 2004). From 2000 to 2011, rural counties with more non-White residents gained fewer rural health centers when compared to rural counties with more White residents (Ko et al., 2015). Understanding whether residential segregation contributes to access to health care, particularly in rural areas, can help to clarify whether “place-based” factors partially account for racial and ethnic disparities in health care.

The research linking residential segregation to health care has been primarily restricted to urban areas, with findings being mixed whether segregation consistently corresponds with lower levels of access to health care. On the one hand, fewer African Americans living in predominantly African American neighborhoods had an office-based physician visit in the past year, compared with Whites in predominantly White neighborhoods (Gaskin et al., 2011). Hispanic families who lived in neighborhoods with more Hispanics reported higher levels of dissatisfaction that their family could get needed medical care, relative to White families living in White neighborhoods (Kirby et al., 2006). On the other hand, being Hispanic and living in a predominantly African American county was associated with an increase in preventive screenings compared to Hispanics living in other types of counties (Benjamins et al., 2004). African Americans and Hispanics may also perceive fewer barriers to health care when they live in a county with people of a similar race/ethnicity (Haas et al., 2004).

A concern when calculating measures of residential segregation is the geographic unit used to describe the distribution of individuals across micro-units within macro-units. Conceptually, census block groups or tracts approximate “neighborhoods” and the residential separation of certain racial/ethnic groups within larger housing markets in a county or metropolitan area (Krieger et al., 2004). In rural areas, the geographies of scale for segregation are a particular challenge as census geographies vary more widely than those in urban areas and rural populations can live in areas where the nearest neighbors or physicians are miles away. Considering Christaller's (1966) classic notion of central places which specified how simple

and specialized services are spatially arranged, the relevant macro-units of geographic areas may vary by service type (Dartmouth Institute, 2016), as adults may travel a few miles for primary care but possibly further for specialists and hospitals. Segregation challenges these classic notions of threshold and range for people seeking medical services. While people may access health care outside of their immediate residential area, living in a county characterized by higher levels of segregation could limit the placement of services in relation to that neighborhood and the social and financial resources needed to access those services, thereby creating a starkly uneven distribution of services that would be less sensitive to changes in the spatial scale considered. In a national study of rural segregation, census blocks served as the micro-unit, and census designated places served as the macro-unit (Lichter et al., 2007). A review of research on African American residential segregation and health showed some variation in the macro-unit, with most studies using metropolitan statistical areas (48%) and census tracts as the micro-unit (White, 2011). In this study, we examine whether our results are sensitive to differing spatial scales.

This study tested three hypotheses to examine the potential influence of residential segregation in rural areas, operationalized as non-metropolitan areas, on access to four types of health care services. First, higher levels of segregation are expected to correspond to lower levels of access to health care. Second, the relationship between segregation and access to health care is predicted to differ by individual-level race/ethnicity. And third, in rural areas, the identified associations are hypothesized to remain even when the spatial scale of the segregation measure changed.

2. Methods

2.1. Data and sample

The study used individual, census tract, and county-level data from three sources. Individual-level data were drawn from the 2005 through 2010 Medical Expenditure Panel Survey (MEPS) Household Component File, which provided self-reported information regarding respondents' access to health care. The MEPS is conducted by AHRQ and is a nationally representative survey conducted in person in English and Spanish, with a response rate ranging from 54% to 61%. To obtain contextual level characteristics, county and tract information of MEPS respondents were merged with data from the American Community Survey 2005–2009 and the Area Health Resources Files 2010. We used restricted data for this study. The data file was created by AHRQ, and we conducted the analyses of this data file at the California Census Research Data Center.

The pooled 2005–2010 MEPS sample contained 113,814 respondents, aged 18–64. The Agency for Healthcare Research and Quality was able to match the addresses for 94.5% of respondents to county and census tract level data, resulting in an analytic sample of 107,593 respondents. Due to the restricted nature of data, we were unable to identify the tracts and counties of residence for the 6221 individuals in the pooled data who are therefore not in the analytic sample. Some individual-level variables contained missing data (n=722); a sensitivity analyses revealed minimal bias. Depending on the outcome, samples ranged in size. For national estimates, samples ranged from 106,024 to 49,992. For non-metropolitan area estimates, samples ranged from 16,545 to 7921.

2.2. Measures

2.2.1. Access to health care

Access to health care was defined as the capacity to obtain health care and the utilization of preventive screenings. Each outcome adheres to recommendations set forth by the U.S. Preventive Services Task Force, American Cancer Society, and Healthy People 2020 goals.

Usual source of health care gauges the capacity by which respon-

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