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Race disparities in low birth weight in the U.S. south and the rest of the nation☆

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ABSTRACT

There are well-documented and as yet unexplained disparities in birth outcomes by race in the USA. This paper examines the sources of disparities in low birth weight between blacks and whites in the US, by focusing on differences in disparities between two very distinct geographic areas, the Deep South and the rest of the country. Two findings from prior research drive the analyses: first, health overall is worse in the Deep South states; second, race disparities are smaller in the Deep South than in the rest of the nation. A number of potential explanations for these findings are examined using nationally representative data on approximately 8,000 children born in the US in 2001. Results suggest that, first, almost all of the increased burden of low birth weight in the Deep South states may be explained by differences in race composition and socioeconomic status between the Deep South and rest of the nation. Second, the slightly lower race disparities found in the Deep South states are being driven not by better outcomes for black mothers, but by two other factors: higher returns to socioeconomic status for black mothers and much worse outcomes for poor white mothers in the Deep South compared with the rest of the country.

Introduction

There are well-documented and as yet unexplained disparities in birth outcomes by race in the United States. One question that has been insufficiently explored is how much infant health disparities vary within the United States. South/non-South comparisons within the US are possibly of particular value since those areas are thought to differ considerably in terms of race relations and residential segregation, factors associated with health outcomes. The South/non-South comparison is also of value because overall health has been shown to be worse in the South than in the rest of the nation, yet there is evidence that race disparities may be lower in the South for some measures of health.

These two puzzles (worse health overall in the South and lower race disparities in the South) suggest that one or a combination of the following are operating: (1) Higher proportion of blacks and lower levels of socioeconomic status (SES) across all groups in the South than in the rest of the nation; (2) Higher prevalence of risk factors in the South than in the rest of the nation; (3) Smaller black/white differences in SES in the South than in the rest of the nation; (4) Higher health returns to SES for blacks or lower returns for whites in the South than in the rest of the nation; or (5) The health disadvantages associated with living in the South are greater for whites as compared to blacks. These potential explanations are explored.

Background

Non-Hispanic black children, who are also more likely to be poor, have much higher rates of infant mortality, preterm birth, and low birth weight (LBW) than do white children (Martin et al., 2006; Matthews & MacDorman, 2006). A number of social processes have been hypothesized to contribute to these disparities, including poverty, low levels of education, exposure to toxic environments, bad neighborhoods, poor working conditions, lack of access to quality health care, discrimination, and high levels of stress (Williams & Collins, 1995). Because no national data source has measures on all these constructs or how they change across the life course, race disparities in most studies remain unexplained.

An alternative approach to understanding the source of race disparities is to examine geographic variation in disparities, taking advantage of the differing political, economic, and social contexts across areas. These types of analyses can point to or rule out particular mechanisms that contribute to disparities. A recent study comparing racial disparities in LBW in the US and England, countries with different policy contexts, found similar overall rates of LBW and black/white disparities in the two countries, suggesting that lack of health insurance and extreme poverty are not the driving forces behind these disparities (Teitler, Reichman, Nepomnyaschy, & Martinson, 2007).

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A similar comparative approach can be applied within the US, where there is substantial geographic variation in health outcomes. Regional differences in measures of adult health, including stroke, cancer, cardiovascular disease, and mortality rates have been previously identified in the US, with higher burdens of disease in Southern, particularly rural, areas (Chandra & Skinner, 2004; Glymour, Avendano, & Berkman, 2007). In a recent ranking of all US states, those in the South were in the bottom quintile on 32 separate indicators of quality of the health care system, access to health care, and health outcomes (Cantor, Schoen, Belloff, How, & McCarthy, 2007).

Regional differences are also apparent for birth outcomes. In 2003, rates of LBW varied from 6% in Washington to 11.4% in Mississippi (Martin et al., 2005). Higher rates of infant mortality, LBW, and preterm birth have been found for the entire Southern region (Allen, Buehler, Hogue, Strauss, & Smith, 1987; Thompson, Goodman, Chang, & Stukel, 2005), and are particularly apparent in the Deep South states (Goldhagen et al., 2005), a cluster of contiguous states in the Southeastern region of the US, which relied heavily on plantation agriculture and the slave trade prior to the American Civil War. While this classification has no uniform definition, Alabama, Georgia, Louisiana, and Mississippi are always included, with other states (Arkansas, Florida, North Carolina, South Carolina, Tennessee, Texas, and Virginia) often included (Deep South, 2009).

The Deep South has a unique political and social history, especially with regard to segregation and race relations, which provides a useful context in which to compare race disparities in health with the rest of the nation. Studies exploring race disparities in adult health across urban and rural areas in the US (most rural areas being in the South and urban areas in the non-South states) have found lower disparities between blacks and whites in rural areas, mostly due to poor outcomes for blacks in Northern urban centers (Geronimus, Bound, Waidmann, Colen, & Steffick, 2001; Geronimus, Bound, Waidmann, Hillemeier, & Burns, 1996; Geronimus, Colen, Shochet, Ingber, & James, 2006). Only one study, using data from 1980, explored race disparities in infant health by region, and found lower disparities in infant mortality and LBW in the South than in other regions (Allen et al., 1987).

Another approach to understanding the sources of racial disparities is to explore how the role of SES in improving child health varies across groups. Though graded relationships between SES and child health have been well-documented, only a handful of studies have examined these relationships for birth outcomes across racial groups, and have generally found the strongest graded associations for whites, and weaker or non-existent ones for blacks (Acevedo-Garcia, Soobader, & Berkman, 2005; Colen, Geronimus, Bound, & James, 2006; David & Collins, 1997; Kleinman & Kessel, 1987; Nepomnyaschy, 2009; Pallotto, Collins, & David, 2000; Parker, Schoendorf, & Kiely, 1994). The consequence of this pattern is that the largest black–white disparities in LBW are found for those at higher levels of SES (Colen et al., 2006; Geronimus, Hicken, Keene, & Bound, 2006; Nepomnyaschy, 2009). Whether these findings hold in the Southern states, given the legacy of institutional discrimination, on the one hand, and worse infant health and higher levels of poverty across all groups, on the other hand, is an important question that has not been addressed.

Because of the lack of broader measures in most data, maternal education is the most commonly used measure of SES in research on infant health. Studies that used different indicators of SES found that results were sensitive to the indicator used (Braveman, Cubbin, Marchi, Egerter, & Chavez, 2001; Parker et al., 1994). The variability in the associations of infant health with SES across race and ethnicity and by SES indicator calls for a broader set of measures of SES to be included in such studies.

This study extends previous cross-national work to explore regional differences in racial disparities in birth outcomes within the US. This study also extends prior work examining associations between SES and birth outcomes across groups, by exploring regional variation in these associations. This work contributes to prior research by using a new, nationally representative study of over 8000 children, which contains rich data on family SES, parental health, health behaviors and many other individual and family characteristics.

Data and methods

Data

This study uses data from the Early Childhood Longitudinal Survey–Birth Cohort (ECLS-B), a nationally representative study of over 10,000 children born in the US in 2001. Births were sampled from Vital Statistics records, and the sample consists of children born in 2001 who were alive at the 9-month baseline interview, had not been given up for adoption, and who were born to mothers 15 years old or older (see Bethel, Green, Kalton, & Nord, 2005 for detailed study description). The current study is based on interviews with mothers when the infant was 9 months old (baseline), to which birth certificate data were appended. The analysis sample is based on approximately 8500 singleton births with the following exclusions: multiple births ($n = 1700$), respondent was not the biological mother ($n = 100$), missing data on birth weight ($n = 150$), and missing data on covariates ($n = 150$) (for variables with <100 missing observations). For variables with >100 missing cases (financial assets, first birth, obesity, prenatal care, and medical risk factor), missing indicator variables were created and included in the regression models. The analysis sample was identical to the full ECLS-B sample based on demographic characteristics (results available upon request).

LBW was based on report of birth weight on the birth certificate and coded as a dichotomous variable if the child weighed less than 2500 g. LBW has been found to be a well-measured and reliable indicator of child health and is associated with a number of poor subsequent health and developmental outcomes (Reichman, 2005), though these associations are not necessarily causal (Basso, Wilcox, & Weinberg, 2006; Wilcox, 2001).

Following Goldhagen et al. (2005), the mother's residence in the Deep South at the time of the child's birth, from the birth certificate, is coded as a dichotomous variable if she resided in one of the nine following states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee. Though this grouping of states does not represent a universal definition of the Deep South, these states are a contiguous group of states in the south of the US and nearly all have elevated rates of LBW as compared with the national average (Martin et al., 2006).

Mothers' race/ethnicity, from the birth certificate, is collapsed into three groups: non-Hispanic white, non-Hispanic black, and all other race/ethnicities. For analyses examining overall differences between the Deep South/non-Deep South areas, all three groups are included in the analyses; for the analyses of black/white disparities, the other race/ethnic group is dropped (3300 cases). The final analyses are based on approximately 700 blacks and 900 whites in the Deep South states, and 800 blacks and 2900 whites in the rest of the states.

The following demographic and SES variables are included: mother's age at birth (<20, 21–30, >30); mother's education ($<$high school, high school/GED (General Equivalency Diploma), some college, college degree or higher); household income from all sources in the past year (collapsed into approximate quartiles: bottom quartile $\leq$\$15,000; 2nd quartile = \$15,001–\$30,000; 3rd