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Segregation and Disparities in Health Services Use

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Abstract

We compared race disparities in health services use in a national sample of adults from the 2002 Medical Expenditure Panel Survey and data from the Exploring Health Disparities in Integrated Communities Project, a 2003 survey of adult residents from a low-income integrated urban community in Maryland. In the Medical Expenditure Panel Survey data, African Americans were *less* likely to have a health care visit compared with Whites. However, in the Exploring Health Disparities in Integrated Communities Project, the integrated community, African Americans were *more* likely to have a health care visit than Whites. The race disparities in the incidence rate of health care use among persons who had at least one visit were similar in both samples. Our findings suggest that disparities in health care utilization may differ across communities and that residential segregation may be a confounding factor.

Keywords

health care disparities; segregation; minority health

Racial disparities in health care utilization have been well documented (Institute of Medicine [IOM], 2003; Mayberry, Mili, & Ofili, 2000). Findings based on analyses of national survey data have contributed greatly to our understanding of health care disparities (Agency for Healthcare Research and Quality [AHRQ], 2006; IOM, 2003; Hargraves & Hadley, 2003; Lillie-Blanton & Hoffman, 2005; Mayberry et al., 2000). These studies do a reasonably good job of controlling for individual level demographic, health, and socioeconomic factors that are associated with race and could confound the observed association between race and health care use. However, these studies suffer from a limitation because they do not adequately control for environmental and market-level factors correlated with race that determines health care access and use. Race is correlated with these factors in part because of residential segregation. Residential segregation is an important confounder because it is associated with inequities in geographic availability of health care providers, information, transportation, and other factors that influence health care access and

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use (Williams & Collins, 2001). Hence, the disparities in access and use that produced inequities in these factors are often attributed to race. In other words, African Americans may have lower rates of health care use in comparison with Whites because of differences in geographic access to care due to residential segregation.

Prior studies have focused on racial differences in individual-level predisposing, enabling, and need factors for explanations of observed disparities in health care use (Hargraves & Hadley, 2003; Lillie-Blanton & Hoffman, 2005; Shi, 1999; Weinick, Zukekas, & Cohen, 2000). Lillie-Blanton and Hoffman (2005) concluded that a sizable share of the difference in whether a person has a regular source of care could be reduced if African Americans were insured at levels comparable with those of Whites. Weinick et al. (1999) found that approximately one half to three quarters of the disparities in health services use would remain even if racial and ethnic disparities in income and health insurance coverage were eliminated. Hargraves and Hadley (2003) found that health insurance and income are two major factors in disparities in access to care. However, they concluded that racial disparities in access to care were not entirely explained by differences in individual characteristics and health insurance coverage. Hargraves and Hadley found that community characteristics accounted for some differences in having a regular provider and seeing a doctor in the past year. They concluded that if African Americans lived in communities with levels of safety net providers, such as physicians providing charity care or emergency departments in hospitals, similar to that of Whites, disparities in utilization would diminish. Disparities exist even among Whites and minorities with a regular source of care. Shi (1999) found that in comparison with Whites, minorities relied more on hospital-based providers for primary care. This difference may not be due to patient preferences but rather to higher proportions of minorities living in center cities where hospitals provide more primary care.

This article compares race disparities in health care use in the Exploring Health Disparities in Integrated Community (EHDIC) project sample to a nationally representative sample from the Medical Expenditure Panel Survey (MEPS). EHDIC is an ongoing multisite study of race disparities within communities where Blacks and Whites live together, and there are no race differences in socioeconomic status. The first EHDIC site was in Baltimore, Maryland. Future EHDIC locations are planned. The purpose of the EHDIC project is to study disparities in health, health behaviors, and health care utilization among Blacks and Whites living in the same social context (LaVeist et al., 2008). The underlying premise is that the impact of race is confounded by social context (LaVeist, 2005). The EHDIC study is described in more detail elsewhere (Casagrande, Gary, LaVeist, Gaskin, & Cooper, 2007; LaVeist et al., 2008; Thorpe, Brandon, & LaVeist, 2008). The institutional review board of the Johns Hopkins Bloomberg School of Public Health approved the study, and all respondents gave informed consent.

New Contribution

Most national studies on race disparities in health care use do not adequately control for differences in geographic access to care because they usually control for provider availability at the metropolitan statistical area (MSA) or county level. This approach assumes that all persons in the MSA or county have similar geographic access to these providers. However, because residential segregation geographically concentrates minorities within MSAs, they may have less geographic access to care than Whites in the same MSA. We compare the disparities in health care use between Whites and Blacks who live in the same communities with disparities in a national sample. Our study explored whether there was a potential relationship between segregation in disparities because this has not been explored previously. Our findings provide preliminary evidence that a larger more rigorous study of the role of residential segregation and health care disparities is warranted.

Method

We analyzed disparities in health care use among Blacks and Whites in two data sets: the EHDIC sample (Baltimore), and the 2002 MEPS adult sample. We used the 2002 MEPS for comparison because the EHDIC survey was fielded in the summer of 2003 and asked about health care utilization during the prior year. EHDIC survey is a cross-sectional face-to-face survey of the adult population (age 18 and older) of two contiguous, census tracts in Baltimore, Maryland. This study site was selected because it is racially and economically balanced. We conducted a nationwide assessment of census tracts that met the following three criteria: (a) racially balanced, that is, at least 35% Blacks adults and 35% Whites adults; (b) economically balanced, that is, ratio of Black/White median income between 0.85 and 1.18; and (c) educationally balanced, that is, ratio of Black/White high school graduation rate ratios between 0.85 and 1.18. Nationally out of 66,438 census tracts only 435 met these criteria. Among these racially integrated communities, we selected census tracts representative of low- and high-income areas in urban and rural environments. The present study was based on results of the first EHDIC data collection, which were two contiguous low-income urban census tracts. Of the 3,555 adult residents, approximately 40% were enrolled into the study (N = 1,489) between June and August 2003. The sample had a higher proportion of Blacks but otherwise was representative of the residents of the two census blocks. The EHDIC sample was 59.3% Black and 44.9% male compared with 51% Black and 49.7% male from the 2000 census. The median incomes in EDHIC were $23,400 for Blacks and $24,900 for Whites. This was comparable with $23,500 for Black and $24,100 for Whites in the 2000 census. The age and educational attainment distributions were also similar to the census data, and the survey had similar coverage across the seven census blocks within two tracts.

The MEPS is a longitudinal survey that covers the U.S. civilian noninstitutionalized population. It is fielded by the AHRQ based on a sampling frame of the National Health Interview Survey. The MEPS is widely used as authoritative source of information on the nation's health care use. AHRQ uses it to monitor the nation's progress on health care disparities (AHRQ, 2006). More information about the MEPS is available on their Web site, www.meps.ahrq.gov/mepsweb. The 2002 MEPS sample consist of 23,264 noninstitutionalized adults between the ages of 18 and 64. Because the EHDIC consisted of only Blacks and Whites, we included only Black and White respondents reducing the sample to 16,546.

Our dependent variables were (a) whether the individual had visited to a health care professional in the past 12 months and (b) the total number of medical care visits in the past 12 months. We controlled for predisposing, enabling, and health need factors in our analysis. The independent variables included race, gender, marital status, age, education, health insurance status, income, general health, and presence of chronic conditions. In the MEPS sample, we also controlled for region of the country. Race, gender, and marital status were dichotomous variables with White, female, and married persons as the respective reference groups. To control for differences in health care utilization related to age, we used age minus 18 and the square of age minus 18. Educational attainment was measured using a set of categorical variables: 8 years or less, 9 to 12 years, some college, and college degree. (The reference group was persons with a high school diploma or GED.) Income was measured as a continuous variable in units of $10,000. Health insurance status was categorized as private, Medicare, and Medicaid/other public insurance coverage. The uninsured was the reference category. We used the respondents' self-reported general health and the presence of chronic conditions to measure health need. We created a dichotomous variable that indicated whether the respondents reported they were in fair or poor health. The presence of a chronic condition was ascertained by asking respondents if a "doctor or health care professional"

had informed them they had hypertension, a heart condition, stroke, cancer asthma, or diabetes. The total number of "yes" responses was summed to create a continuous variable. In the MEPS sample, individuals were categorized by census region and urban–rural location. The reference categories were northeast and urban.

We estimated racial differences in having at least one health care visit and in the total number of health care visits on the MEPS and EHDIC samples. Data analysis was conducted using Stata 9 statistical analysis software. We estimated separate regression models for each outcome. Because the dependent variable in our first model was dichotomous, we used logistic regression analysis. Because our second dependent variable was a count variable, we used negative binomial analysis. Negative binominal regression controls for overdispersion in the dependent variable. To produce accurate national estimates, we used the sampling weights and accounted for the complex survey design of the MEPS. We used survey regressions procedures in Stata to adjust the estimates for clustering and stratification. We compared the coefficients on race between the MEPS and EHDIC regressions. To determine if the coefficient on race differed across samples, we pooled the data and estimated models, including a variable indicating the observation was from the EHDIC sample and an interaction term with this variable and race. We estimated this final model without the weighting the data.

Results

The means and standard deviations of the descriptive statistics for the EHDIC and MEPS samples are displayed in Table 1. The respondents in the EHDIC sample were more likely to have a health care visit than respondents in the MEPS (0.78 vs. 0.69). However, among persons who used care, respondents in the EHDIC sample had fewer visits than respondents in the MEPS (9.8 vs. 13.3). Respondents in the EHDIC sample were in poorer health than respondents in the MEPS. They were more likely to report that they were in fair or poor health (32% vs. 18%), and more likely to report that they had been told by a physician or health care professional they had a chronic condition (1.42 vs. 0.77). The EHDIC sample was 59% Black compared with 15% for the MEPS full sample. Respondents in the EHDIC sample were less likely to be married and were on average younger. The EHDIC sample had lower income and lower educational attainment. EHDIC respondents were less likely to have private health insurance (27% vs. 59%) and more likely to have Medicare coverage (28% vs. 17%). This was probably due to higher proportions of nonelderly EHDIC respondents with disabilities.

To analyze the effect of race on having a health care visit during the year, we estimated separate logistic regressions for each sample (see Table 2). We found differences in the race disparities across the data sets, but similarities for most of other covariates. In the MEPS, Blacks were less likely to have a health care visit compared with Whites (odds ratio [OR] = 0.735; $p < .001$). However, in the EHDIC Blacks were more likely to have a health care visits than Whites (OR = 1.435; $p = .017$). Using sample pooling EHDIC and MEPS, we tested whether the coefficient on race was statistically significant by incorporating a dummy variable indicating an observation from the EHDIC and an interaction term with race. The coefficient on the interaction term was 0.774 ($p < .000$) indicating that the difference in impact of race was statistically significant.

Comparisons of the other covariates such as gender, age, marital status, income, and education across samples show similarities in the directions and magnitudes of coefficients. The OR for male was 0.408 in the EHDIC sample compared with 0.365 in the MEPS. Both were statistically significant. The ORs for age, marital status, and income were also similar across the two samples, but statistical significance varied across samples. The impact of

educational attainment was similar in both samples—the odds of a health care visit increased with educational attainment. In comparison with high school graduates, persons with less than a high school education were less likely to have a health care visit. Conversely, persons with some college experience and those with 4-year college degrees or more were more likely to have a visit. While in the EHDIC sample, the ORs for some high school experience and some college experience were statistically insignificant, the magnitudes were similar to the MEPS sample.

However, there were some differences in the impact of health and health insurance status. Other than race, fair/poor health was the only other covariate where the direction of the ORs differed across the sample. Persons in fair/poor health in the MEPS were more likely to have a health care visit (OR =1.749; $p < .001$), while in EHDIC persons in fair/poor health were less likely to have a visit (OR = 0.927), although this association was statistically insignificant. The association of number of chronic conditions and the odds of a health care visit was in the same direction in both samples but stronger in the MEPS sample. The pattern for insurance status was different across the samples. For both sample, the odds of privately insured persons having a health care visit were more than twice the odds of the uninsured. Medicaid coverage had greater impact for persons in the MEPS (OR = 2.183) relative to persons in EHDIC (OR = 1.407), while Medicare had a greater impact for persons in EHDIC (OR = 2.761) compared with persons in the MEPS (OR = 1.734).

To analyze the effect of race on the total number of health care visits during the year, we estimated negative binominal regressions for each sample (see Table 3). In the MEPS, among persons who had at least one visit, African Americans had a 29% lower incidence rate of visits compared with Whites. In the EHDIC sample, among persons with at least one visit, African Americans had a 19% lower incidence rate of visits compared with Whites. In both models, the overdispersion parameter was significantly different from 1 indicating that the negative binominal regression technique is appropriate for analyzing the data. To test whether the effect of race was statistically different across the two samples, we estimated models pooling both samples. We found that the coefficient of an interaction term was 0.062 ($p < .343$), which indicated that the difference was not statistically significant.

The relationships of the other covariates to number of health care visits were not as similar in magnitude and direction as in the logistic regression models. Only incidence rate ratios (IRRs) for number of chronic conditions, some college, college degree or better, and Medicare were similar in magnitude. For a few of the covariates, the estimated IRRs were in opposite directions across the samples, while for others the estimated IRRs were statistically insignificant for one or both samples.

Discussion

We found differences in the impact of race on health care use between the MEPS and EHDIC samples. The differences between the MEPS sample and the EHDIC sample with respect to the impact of race lie in who gets care, but for the individuals who do get care, there is no significant difference in the race disparity in average number of visits. Nationally, Blacks were less likely to have a health care visit when compared with Whites, but in the EHDIC sample Blacks were more likely to have a visit when compared with Whites. However, the race disparity in the incidence rate of use of health care visits among persons who had at least one visit was the same for Blacks and Whites in the EHDIC and national samples. Our findings suggest that there is a potential relationship between segregation and race disparities in health care use. A more rigorous study is warranted to determine whether segregation confounds the relationship between race and health care use.

The relationship between residential segregation and health care is understudied, but numerous studies have explored the relationship between residential segregation and health (Acevedo-Garcia, 2001; Acevedo-Garcia, Lochner, Osypuk, & Subramanian, 2003; Culhane & Irma, 2005; LaVeist, 1993, 2003; Morello-Frosch & Jesdale, 2006; Subramanian & Acevedo-Garcia, 2005; Williams & Collins, 2001). Segregation has been linked to disparities in infant and adult mortality rates (LaVeist, 1993, 2003; LaVeist & Wallace, 2000; Polednak, 1996a, 1996b; Yankauer, 1950), high-risk pregnancies (Bell, Zimmerman, Mayer, Almgren, & Huebner, 2007; Osypuk & Acevedo-Garcia, 2008), poor health (Subramanian & Acevedo-Garcia, 2005),exposure to cancer-causing air toxics (Morello-Frosh & Jesdale, 2006),and rates of tuberculosis and other infectious diseases (Acevedo-Garcia, 2000). The primary mechanisms for these relationships are the environmental risk factors that accompany segregation (Williams & Collins, 2001). Segregated communities often have fewer and lower-quality public resources and higher rates of poverty (Acevedo-Garcia, 2000).

In contrast to the voluminous literature on segregation and health, studies on segregation and health care are relatively sparse. A few studies provide some evidence that residential segregation reduced minority access to health care providers particularly to physician care (Fossett, Chang, & Peterson, 1991; Fossett, Perloff, et al., 1991). Physician participation in Medicaid was lower in communities with higher percentages of minority residents (Bronstein, Adams, & Florence, 2004; Mitchell, 1991; Perloff, Kletke, Fossett, & Banks, 1997). African Americans communities have fewer health care resources, and thus African Americans are more likely to rely on community health centers, hospital outpatient departments, and emergency rooms for primary care (Gaskin et al., 2007; Lillie-Blanton, Martinez, & Salganicoff, 2001). Studies have shown that physicians serving African Americans reported difficulty referring their patients to high-quality specialists, accessing diagnostic imaging services, obtaining ancillary services, admitting their patients for elective hospital services, and communicating with other providers about their patients (Bach, Pham, Schrag, Tate, & Hargraves, 2004; Reschovsky & O'Malley, 2007).

A handful of studies have looked at the relationship between segregation and hospital care (Smith, 1998; Smith, Feng, Fennel, Zinn, & Mor, 2007). For example, a recent study showed that residential segregation increased odds of using high-mortality hospitals for Black Medicare patients who suffered a prior acute myocardial infarction despite the closer proximity of lower-mortality hospitals (Sarrazin, Campbell, & Rosenthal, 2009). This seems paradoxical. A possible explanation may be that segregation negatively affects Black Medicare patients' access to physicians with admitting privileges to low-mortality hospitals.

Our study has two limitations. One, the EHDIC sample is a low-income community and thus the results may not apply to persons living in moderate- to higher-income communities. Residents of more affluent communities are more likely to own automobiles and are less dependent on health care providers located near their homes, although time costs and overall convenience are still relevant for this population. Two, we compared persons living in two integrated census tracts with a national sample. While the level of integration was the characteristic for selecting these census tracts, observed differences between EDHIC and MEPS could be due to other factors.

Efforts to eliminate disparities in health care use have targeted factors such as health education, health literacy, cultural competency, patient–provider communication and provider bias. As new studies explore the relationship between residential segregation and Black and other minority patients' access to and use of care, new policies and interventions will be developed to address disparities. Policy makers should consider policies designed to

remedy problems related to segregation such as encouraging physicians and other health care providers to locate in African American communities and other communities of color.

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Table 1

Descriptive Statistics of the Dependent and Independent Variables

	EHDIC Sample		MEPS	
	Mean	***SD***	**Mean**	***SD***
Dependent variable				
Had a health care provider visit during the past year	0.777	0.416	0.688	0.463
Number of health care visits in past year	9.838	14.334	13.306	25.773
Independent variable				
Fair or poor health	0.317	0.465	0.1766	0.381
Number of chronic conditions	1.420	1.587	0.769	1.176
South	—	—	0.377	0.485
West	—	—	0.256	0.437
Midwest	—	—	0.200	0.400
Rural	—	—	0.213	0.409
Male	0.449	0.498	0.461	0.499
Black	0.593	0.491	0.151	0.358
Marital status	0.197	0.398	0.557	0.497
Personal income (000s)	2.702	1.960	2.973	2.157
Age	40.720	14.616	44.726	17.486
Age squared	1,871.594	1,336.558	2,306.144	1,729.306
Eighth grade or less	0.121	0.326	0.107	0.309
Some high school	0.347	0.476	0.170	0.375
Some college	0.119	0.324	0.197	0.398
College degree	0.083	0.277	0.198	0.399
Private health insurance	0.271	0.444	0.594	0.491
Medicaid/other public aid	0.119	0.324	0.121	0.326
Medicare	0.284	0.451	0.174	0.379

Note: eHDIC = exploring Health Disparities in Integrated Communities Project; MePS = Medical expenditure Panel Survey.

Table 2

Results From Logistic Regression of Determinants of Having at Least One Health Care Provider Visit During the Past Year

	EHDIC		MEPS	
	Odds Ratio	***SE***	**Odds Ratio**	***SE***
Black	1.435*	0.217	0.736***	0.045
Fair or poor health	0.927	0.159	1.749***	0.132
Number of chronic conditions	1.357***	0.086	1.787***	0.073
South	—	—	0.794**	0.060
West	—	—	0.856*	0.065
Midwest	—	—	0.902	0.076
Rural	—	—	1.122*	0.060
Male	0.408***	0.060	0.365***	0.015
Marital status	1.098	0.211	1.205***	0.060
Personal income (000s)	1.061	0.046	1.053***	0.014
Age	0.915**	0.026	0.987	0.010
Age squared	1.001**	0.000	1.000	0.000
Eighth grade or less	0.595*	0.144	0.594***	0.046
Some high school	0.799	0.135	0.854*	0.052
Some college	1.074	0.273	1.216**	0.074
College degree	2.206*	0.836	1.847***	0.122
Private health insurance	2.101***	0.396	2.330***	0.123
Medicaid/other public aid	1.407	0.385	2.183***	0.187
Medicare	2.761***	0.509	1.734***	0.195

Note: eHDIC = exploring Health Disparities in Integrated Communities Project; MePS = Medical expenditure Panel Survey.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3

Negative Binomial Regression Models of Determinants of the Number of Health Care Visits

	EHDIC		MEPS	
Number of Medical Care Visits in Past Year	**IRR**	***SE***	**IRR**	**Linearized *SE***
Black	0.811**	0.054	0.712***	0.034
Fair or poor health	1.019	0.077	1.626***	0.057
Number of chronic conditions	1.228***	0.030	1.282***	0.015
South	—	—	0.831***	0.033
West	—	—	0.848***	0.029
Midwest	—	—	0.917*	0.036
Rural	—	—	0.993*	0.034
Male	1.053	0.070	0.567***	0.015
Marital status	0.941	0.078	1.003	0.029
Personal income (000s)	0.982	0.019	1.006	0.006
Age	0.987	0.011	1.032***	0.005
Age squared	1.000	0.000	0.999***	0.000
Eighth grade or less	1.326*	0.146	0.720***	0.036
Some high school	1.053	0.082	0.927	0.036
Some college	1.175	0.123	1.128***	0.036
College degree	1.399**	0.177	1.318***	0.045
Private health insurance	0.918	0.073	1.504***	0.051
Medicaid/other public aid	1.030	0.107	1.679***	0.073
Medicare	1.561***	0.113	1.668***	0.096
ln Alpha	−0.131***	0.045	0.419***	0.017

Note: eHDIC = exploring Health Disparities in Integrated Communities Project; MePS = Medical expenditure Panel Survey; IRR = incidence rate ratio.

* $p < .05$.

** $p < .01$.

*** $p < .001$.