The Racial Segregation of Hospital Care Revisited: Medicare Discharge Patterns and Their Implications

David B. Smith, PhD

ABSTRACT

Objectives. This paper measures current patterns of hospital segregation among Medicare beneficiaries.

Methods. Data from the fiscal year 1993 Medicare Provider Analysis and Review (MEDPAR) file, the index of dissimilarity, and a linear regression model are used to test the effects of standard metropolitan area characteristics on hospital segregation.

Results. The overall hospital segregation index was 0.529, ranging by state from 0.154 to 0.746. Hospital segregation in 126 standard metropolitan areas was positively related to population size, hospital density, and residential segregation and negatively related to income inequities and location in the South.

Conclusions. Racial segregation remains high and may produce both reporting biases and unequal effects of public policy. (*Am J Public Health.* 1998;88:461–463)

Introduction

The implementation of the Medicare program in 1966 propelled the elimination of all official forms of racial segregation in hospitals.[1-4] The long-term effect of this effort to end racially separate and unequal health services, however, has never been fully assessed. In contrast to information regularly reported on segregation in housing, schools, and employment, no similar information on levels of health care segregation exists. Racial differences in Medicare beneficiary age-adjusted death rates and use of restorative procedures persist even when correction is made for income differences.[5]

Hospital care is currently undergoing changes as significant as those that took place at the time of the original implementation of the Medicare program. If Blacks and Whites use the same facilities, the disparate impact of these changes on hospitals is not a concern; if they use separate ones, it is. This paper presents a measure of segregation in Medicare hospital use and describes its relationship to other characteristics of metropolitan service areas.

Methods

This investigation used data from 2 sources: (1) The expanded modified Medicare Provider Analysis and Review (MEDPAR) file for fiscal year 1993 and (2) 1990 US Census Summary Tape File 1. The MEDPAR file contains records of all Medicare beneficiary discharges from short-term acute and specialty hospitals. These records include racial information on beneficiaries that is derived from Social Security enrollment records and subsequent enrollment surveys; this information is more uniform and complete than that provided by hospital claims data.

This analysis used the most common measure of segregation, the index of dissimilarity,[6,7] which has a range of possible values from zero to one. An index of zero would show that Black and White inpatients are distributed in proportion to their numbers across facilities; each facility would have the same racial composition that exists in the total population of discharges. An index of 1 would show complete separation of the races. The actual value of the index represents the proportion of the 2 populations one would need to shift to create an equal distribution of the races across all facilities.

This measure of segregation was computed for the nation as a whole, for each state, and for 126 standard metropolitan areas with a Black population of more than 30 000. Standard metropolitan areas have often been used as rough approximations of hospital service areas. Hospital segregation is assumed to result not from illegal acts of discrimination but from the same factors that influence where any person is admitted within a service area. These factors include (1) the size of the metropolitan area and, thus, the diversity of hospitals it is able to support; (2) relative hospital density; (3) residential proximity; (4) income; and (5) historical patterns of use. The larger the metropolitan area and the larger the number of hospitals per unit of population, the greater the choices individuals have and the greater the potential for racial segregation; the larger the degree of residential segregation and income inequities, the greater the likelihood of segregation in hospital use. Historically, Jim Crow practices have been most concentrated in the South.

A linear regression model tested the independent effect of measures related to each of these 5 factors on the degree of hospital segregation in a metropolitan area. Specifically, the 5 measures included in the model were (1) the natural log of standard metropolitan area total population; (2) hospital density, or the number of hospitals per 100 000 population; (3) the index of dissimilarity for residential segregation; (4) the index of dissimilarity for racial income differences; and (5) a dummy variable for location of the standard metropolitan area

within the region. The natural log of population size was chosen because inspection suggested that the effect was log linear.

Results

Of the 11 075 789 Medicare discharges from 5393 short-term acute and specialty care hospitals, 84.31% involved White patients, 9.77% involved Black patients, 2.91% involved patients of other races, and 3.01% involved patients whose race was unknown. As shown in Table 1, the index of segregation for the United States as a whole was 0.529; state indexes ranged from 0.154 to 0.716. States in the Midwest and Northeast, where Black populations are more concentrated in urban areas, had generally higher segregation indexes than southern states. As shown in Table 2, the linear regression model used to predict hospital segregation in the 126 standard metropolitan areas with the largest Black populations produced an R^2 value of 0.54 ($P < .0001$). Hospital segregation was related to the natural log of the population of the metropolitan area ($P < .001$), the relative density of hospitals ($P < .001$), and residential segregation ($P < .01$) (Table 3). It was negatively related to associated racial income inequities ($P < .05$) and to location in the South ($P < .05$). The natural log of the population was negatively correlated with hospital density (−0.528 [smaller standard metropolitan areas tend to have smaller hospitals and, thus, more relative choice]), and this should be kept in mind when interpreting the magnitude of these coefficients.

Discussion and Conclusions

The purpose of this paper has been to present descriptive measures of hospital segregation that have been alluded to only indirectly in the literature on racial differences in health care use and outcomes. The causal relationships are complex. They require further analysis beyond the simple model presented here and, hence, some caution in interpretation.

The results, however, suggest a significant transformation of the South, at least from its popular image in the pre–civil rights era. While Jim Crow practices have historically been most concentrated in the South, in terms of hospital care in the Medicare program the South is the country's most racially integrated region. On average, the 64 metropolitan areas in the South included in this analysis

were smaller and had higher hospital densities and more racial income inequities, but less residential segregation, than the 62 metropolitan areas included from other regions of the country. In attempts to correct for these differences, however, the model showed a significant effect for location in the South. In general, the metropolitan areas of the South had a higher percentage of Black beneficiaries, and this may

also have exerted some indirect influence on rates of hospital segregation.

Nevertheless, there remains substantial racial segregation of Medicare beneficiaries in hospitals, reflecting the geographic distribution and persistence of residential segregation of the Black population. The index used here understated segregation in the United States medical care system because it (1) compared a fully insured population

TABLE 1—Racial Segregation of Medicare Hospital Discharges by State

State	No. Providers	Total White	Total Black	Index of Dissimilarity
Delaware	7	23 859	4 019	0.154
Hawaii	22	9 004	148	0.168
Puerto Rico	54	80 957	7 696	0.204
South Carolina	70	97 752	33 127	0.275
Mississippi	103	101 131	40 841	0.275
New Mexico	44	41 336	665	0.286
Louisiana	146	156 264	50 999	0.288
Connecticut	35	122 126	7 033	0.315
North Carolina	128	225 424	54 039	0.316
Rhode Island	12	47 240	1 192	0.326
Alabama	115	181 990	46 088	0.335
Nevada	23	38 365	1 947	0.341
Maine	40	56 905	98	0.346
Alaska	22	5 403	171	0.351
West Virginia	58	105 898	3 589	0.362
Georgia	160	218 910	64 816	0.362
Oklahoma	114	127 997	7 539	0.367
New Hampshire	26	38 964	122	0.368
Kentucky	104	183 922	10 932	0.378
Vermont	15	20 469	52	0.381
Utah	41	37 335	189	0.387
Maryland	54	149 692	37 147	0.389
Montana	57	36 278	75	0.389
Wyoming	27	13 162	105	0.393
Florida	213	612 012	50 011	0.393
Virginia	99	190 836	45 699	0.403
Idaho	41	31 512	56	0.405
Texas	410	518 580	62 938	0.410
New Jersey	91	314 838	39 053	0.418
Arizona	68	120 649	2 362	0.420
North Dakota	51	34 140	38	0.433
South Dakota	58	37 646	75	0.436
Tennessee	135	245 317	34 833	0.453
Ohio	190	459 824	49 724	0.458
Iowa	122	135 768	2 017	0.468
Massachusetts	101	292 722	9 256	0.468
District of Columbia	10	14 232	20 317	0.477
Kansas	132	105 557	4 705	0.480
New York	231	636 553	77 106	0.485
Washington	95	148 361	3 329	0.498
Arkansas	83	118 695	15 765	0.503
Colorado	66	93 087	2 706	0.518
California	453	723 055	62 740	0.525
Indiana	118	236 474	18 673	0.540
Oregon	64	99 706	1 231	0.556
Minnesota	145	151 488	1 795	0.570
Missouri	133	240 661	23 227	0.572
Michigan	173	325 843	51 259	0.575
Pennsylvania	210	643 855	57 822	0.581
Nebraska	91	60 928	1 460	0.607
Illinois	205	421 085	63 796	0.616
Wisconsin	128	204 444	7 222	0.716
Total	5 393	9 338 251	1 081 844	0.529

Note. Data were derived from the fiscal year 1993 MEDPAR file.

TABLE 2—Regression Model for Medicare Hospital Segregation in Standard Metropolitan Areas of the United States: Analysis of Variance

	df	Sum of Squares	Mean Square	F	P-Value
Source	5	1.2460	0.2492	28.092	.0001
Model	120	1.0645	0.0089		
Cumulative total	125	2.3105			

Root MSE = 0.0942
Mean = 0.3255
R^2 = 0.5393

Note. Data were derived from the fiscal year 1993 MEDPAR file and from 1990 US Census Summary Tape File 1.

TABLE 3—Regression Model for Medicare Hospital Segregation in Standard Metropolitan Areas of the United States: Parameter Estimates

	DF	Parameter Estimate	SE	t	P-Value
Intercept	1	−0.7647	0.2098	−3.645	.0004
Natural log of population	1	0.0711	0.0129	5.490	.0001
Hospital density	1	0.0663	0.0108	6.127	.0001
Residential segregation	1	0.2647	0.0797	3.322	.0012
Racial income inequities	1	−0.3680	0.1566	−2.351	.0204
Location in the South	1	−0.0470	0.0197	−2.366	.0186

Note. Data were derived from the fiscal year 1993 MEDPAR file and from 1990 US Census Summary Tape File 1.

with common benefits, (2) failed to account for economic segregation that might take place within rather than between facilities, and (3) failed to take account of the primary and long-term care services that are less evenly distributed and for which greater racial discrepancies in patterns of use exist.

The impact of the current transformation of health care on segregation is unclear. Other factors remaining equal, the trend toward consolidation, if it continues, will result in a statistically significant reduction in segregation. However, the provision of hospital care under the Medicare program remains quite racially separate, as shown by the racial segregation indexes computed here.

In the tradition of the Brown v Board of Education precedent that was eventually applied to hospitals, is separate unequal? It is beyond the scope of this paper to address this issue in terms of quality of care. However, one study that reviewed medical records of Medicare beneficiaries concluded that, while Blacks and the poor tend to receive inferior care, this was offset by their 1.8-times-higher likelihood of receiv-

ing care at an urban teaching hospital where better overall care was provided.[8] The more basic conclusion is that, since such care is separate, one should not evaluate information and health policy changes as though it were not.

The degree of segregation also suggests the potential for a systematic racial bias in reporting of health events. Uniform classification and reporting across all service providers has proved an elusive goal. The National Hospital Discharge Survey has shown that the hospitals in the survey's sample not reporting race are overwhelmingly White. White hospital use rates derived from this source of data underestimate actual use.[9] As a consequence, studies using hospital discharge data that have reported large racial differences in the use of such procedures as coronary artery bypass grafts probably understate the differences.[10] Given the variations in testing and reporting practices by urban teaching hospitals as opposed to suburban and rural ones for such events as viable live births, sexually transmitted diseases, and drug and alcohol abuse, rates based on such reports

may similarly exaggerate the racial differences in these rates.

The prevailing high rates of segregation also lend support to concerns about the racially unequal impact of market reforms. Urban public hospitals and teaching hospitals care for a disproportionate share of this population and may be more vulnerable to current changes proposed in the Medicare program and in state and local managed care reforms. The potential for racially separate and unequal effects needs to be at least a visible, measurable consequence if not a moderating influence on such changes. □

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