

Racial Disparities in Rehospitalization Among Medicare Patients in Skilled Nursing Facilities

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Medicare beneficiaries admitted to skilled nursing facilities typically have undergone a recent episode of acute care in a short-term general hospital. Medicare covers their post-acute services during nursing facility stays of up to 100 days, with the purpose of rehabilitation or functional recovery. Patients in these facilities have an average age of 80 years, more than one third are cognitively impaired, and approximately one half have difficulties in activities of daily living and 5 or more comorbidities.¹

Transfer of these vulnerable patients back to hospitals is common,²⁻⁴ yet often considered inappropriate or potentially preventable.^{3,5,6} Broad consensus exists that rehospitalizations of skilled nursing facility patients disrupt service routines and patient-caregiver relationships,⁷ place them at risk for medical errors and iatrogenic problems,^{5,7} lead to greater functional and cognitive impairment,^{7,8} and are associated with elevated Medicare costs.⁶ In its recent report to Congress, the Medicare Payment Advisory Commission recommended reforms in Medicare payment rules to create financial incentives to reduce rehospitalization rates.⁹

Minority nursing home patients tend to receive less adequate care than do non-Hispanic Whites in the management of common chronic conditions,¹⁰⁻¹² such as diabetes; in immunizations against influenza and pneumonia¹³; and in prevention and treatment of pressure ulcers.^{14,15} Racial minorities have also been found to be disproportionately served in nursing facilities with high concentrations of minority or Medicaid patients, poor resources, and inferior quality of care.¹⁶⁻¹⁹ Studies on long-term, custodial care nursing home residents found associations between minority race and higher hospitalization rates.²⁰⁻²³ In an analysis of long-term residents of urban nursing facilities, Gruneir et al.²⁰ reported that 19% of White and 24% of Black residents were hospitalized and that residents in facilities with higher percentages of Blacks had a higher risk of hospitalization. No previous

Objectives. We examined racial disparities in rehospitalization rates among a cohort of non-Hispanic White and Black Medicare beneficiaries admitted to skilled nursing facilities for postacute care.

Methods. We analyzed the 2008 national Nursing Home Minimum Data Set, augmented with other databases. We used multivariable logistic regression to estimate overall racial disparities in rehospitalization rates within 30 days and 90 days of nursing facility admission and the extent to which the disparities were explained by patient, facility, market, and state factors. Stratified analyses identified persistent disparities within patient subgroups, facility types, and states.

Results. The 30-day rehospitalization rates were 14.3% for White patients (n=865 993) and 18.6% for Black patients (n=94 651); the 90-day rehospitalization rates were 22.1% and 29.5%, respectively. Both patient and admitting facility characteristics accounted for a considerable portion of overall racial disparities, but disparities persisted after multivariable adjustments overall and in patient subgroups.

Conclusions. We found persistent racial disparities in rehospitalization among the nation's skilled nursing facility patients receiving postacute care. Targeted efforts are needed to remove these disparities. (*Am J Public Health.* 2011;101:875-882. doi:10.2105/AJPH.2010.300055)

research, however, examined the extent of similar racial disparities among postacute skilled nursing facility residents.

We characterized racial disparities in rehospitalization rates among a national cohort of postacute care Medicare patients admitted to skilled nursing facilities. We assessed (1) whether Black patients were more likely than were White patients to be transferred back to an acute care hospital within 30 days and 90 days of nursing facility admission and (2) whether such racial disparities persisted in subgroups of patients defined by key patient characteristics, facility types, or states, in light of the varied risks of rehospitalization of nursing facility patients associated with individual demographic and health status,^{3,4} facility practice patterns,⁵⁻⁷ and state policies.^{2,24}

METHODS

Our primary source of data was the 2008 Nursing Home Minimum Data Set (MDS), from which we created a retrospective cohort of

national Medicare admissions to all federally certified skilled nursing facilities between January 1 and September 30, 2008. More than 90% of nursing facilities in the United States are federally certified.²⁵ The MDS contained more than 350 assessment items for patient demographics; socioeconomic status; physical, cognitive, and mental health status; disease diagnoses; and routine treatments received. Assessments were performed by nursing staff at admission, at predetermined intervals following admission, and whenever patients incurred a significant change of health status. MDS assessments are considered to be accurate and valid,^{26,27} making the database a useful tool for a broad array of purposes, such as outcome tracking, quality-of-care evaluations, and setting regulatory and payment standards.²⁸

We included in our cohort all MDS admission assessments during the study period that were administratively designated as Medicare prospective payment system assessments. We then linked this admission cohort to MDS discharge-tracking records by unique encrypted

patient identifiers to determine the discharge status of patients within 30 days and 90 days of admission (such as discharge to an acute care hospital). The initial cohort represented 1106 619 admissions. Patients were excluded if they had a do-not-hospitalize order at admission ($n=16\,975$) or died within 90 days of admission ($n=65\,873$, among whom 30172 died within 30 days of admission). The final sample retained only non-Hispanic White and Black patients and excluded the 63127 patients of other race/ethnicity (~6% of all admissions).

We linked this patient sample to 2 external data files: the 2008 Online Survey, Certification, and Reporting file, a facility-level database maintained by the Centers for Medicare and Medicaid, which provided facility covariates, and the 2008 Area Resource File, obtained from the Health Resources and Services Administration, which contained characteristics of nursing home markets. We defined the market as the county where each facility was located.¹⁷ The final analytic sample comprised 960 644 admissions of White and Black Medicare beneficiaries to 14798 skilled nursing facilities.

Variables

The 2 outcomes of interest were whether a patient had at least 1 discharge to an acute care hospital within 30 days and within 90 days of admission to the skilled nursing facility. The key independent variable was patient race (Black vs White). We selected patient covariates that might affect the risk of rehospitalization by considering findings of previous studies^{3,4,24,29} and clinical factors. These covariates were age (categorized as <65 years, 65–74 years, 75–84 years, and ≥ 85 years), gender, education (<high school diploma, high school diploma, some college or technical school, and \geq bachelor's degree), primary language (English vs non-English), marital status (married or not married [i.e., never married, widowed, separated, or divorced]), whether the patient was admitted to the skilled nursing facility directly from a hospital, whether the patient had a do-not-resuscitate order at admission, the number of activities of daily living (ADLs) that each patient could perform at admission, whether the patient had cognitive impairment, and a set of binary variables (1 or 0) indicating the presence (at admission) of diabetes, other endocrine disease, cardiovascular

disease, musculoskeletal disease, dementia, neurologic disease other than dementia, anxiety disorder, depression, schizophrenia, bipolar disorder, pulmonary disease, sensory disease, and other diseases.

ADLs were bed mobility, transfer, dressing, eating, toilet use, personal hygiene, and bathing. We coded each ADL component into 5 categories, from 0 (independence) to 4 (total dependence), resulting in a total range of the aggregate ADL score of 0 to 28. We defined patients as cognitively impaired if they had impaired short-term memory and were dependent in daily decision-making.

Facility covariates were hospital affiliation status (hospital-based vs freestanding), profit status (for-profit, nonprofit, or government), chain affiliation (yes or no), total number of beds, percentage of Black patient admissions, and percentage of Medicaid residents among total current residents. One county-level covariate was a measure of market competition based on the Herfindahl-Hirschman Index,³⁰ calculated as the sum of squared shares of nursing home beds for all nursing homes in the county. Market competitiveness ranged between 0 (least competition) and 1 (highest competition). Other county demand and supply variables were per capita income, percentage of population 65 years old or older, number of persons 65 years old or older per nursing home bed, number of hospital beds per 1000 population, and a designation of rural versus urban area as defined by the US Census Bureau and the Office of Management and Budget in 2008.³¹

Statistical Analyses

We performed bivariate analyses to determine racial differences in rehospitalization rates and in patient, facility, and county characteristics. We compared differences in means with the *t* test and differences in proportions with the χ^2 test.

In multivariable analyses, we estimated 2 sets of logistic regression models to determine the association of Black race with the likelihoods of 30-day and 90-day rehospitalization. The dependent variable in each model was binary: the value was 1 if the patient was rehospitalized and 0 otherwise. Analyses first estimated the overall (or unadjusted) racial effect by including only race in a base model and then sequentially added to the base

model patient covariates (model 1), facility characteristics (model 2), county covariates (model 3), and state dummies (model 4), to determine the extent to which the overall racial disparities in risk of rehospitalization were mediated or explained by these covariates. All models adjusted for the potential clustering of patients admitted to the same facility, through the Huber–White heteroskedasticity estimates of covariates.³²

To determine whether racial disparities varied within subgroups of patients, we estimated additional sets of models, which were stratified by (1) key patient characteristics (age categories, gender, education levels, marital status, difficulties with ADLs, and cognitive impairment status) and (2) key facility attributes (hospital affiliation status, percentage of Medicaid residents [for freestanding facilities], profit status, chain affiliation, number of beds, and percentage of postacute admissions of Black patients). Because previous research showed state variations in skilled nursing facility rehospitalization rates,^{2,24} we also estimated models stratified by state to test racial disparities within each state.

Stratified models adjusted for all patient, facility, and county covariates and state dummies, except for the variable used for stratification. We predicted the 30-day (or 90-day) rehospitalization rates for Black and White patients within stratum for each model, and we defined racial disparity as the difference in predicted rate between Black and White patients. We performed all analyses in SAS version 9.2 (SAS Institute Inc, Cary, NC).

RESULTS

Table 1 presents descriptive statistics of White ($n=865\,993$) and Black ($n=94\,651$) skilled nursing facility patients admitted between January and September 2008. Compared with White patients, Black patients tended to be younger (75 vs 80 years on average) and less likely to have a bachelor's degree or more education (7% vs 12%), to be married (23% vs 32%), or to have a do-not-resuscitate order (10% vs 31%) than were White patients. Diagnosis patterns at admission also varied considerably between racial groups. Furthermore, Black patients were more likely to be admitted to for-profit facilities (78% vs

TABLE 1—Skilled Nursing Facility Patient Characteristics by Race: Nursing Home Minimum Data Set, United States, January–September 2008

	Total (n = 960 644), % or Mean (SD)	White (n = 865 993), % or Mean (SD)	Black* (n = 94 651), % or Mean (SD)
Discharge to hospital			
Within 30 d of admission	14.7	14.3	18.6
Within 90 d of admission	22.8	22.1	29.5
Patient characteristics at admission			
Age, y	76.7 (11.0)	80.2 (10.6)	74.5 (12.9)
Men	34.6	34.1	39.4
Education			
< High school diploma	22.9	21.3	36.9
High school diploma	44.9	45.6	38.9
Some college/technical school	18.1	18.6	13.9
≥ Bachelor's degree	11.9	12.4	6.9
Missing	2.2	2.1	3.4
English as primary language	98.5	98.5	98.7
Married	31.4	32.2	23.2
Admitted from hospital	90.8	90.8	91.0
Had do-not-resuscitate order	29.1	31.1	10.4
Activities of daily living at admission ^a	16.7 (5.3)	16.6 (5.2)	17.6 (6.2)
Cognitive impairment	40.6	40.1	45.4
Disease diagnosis at admission			
Diabetes	33.0	31.3	47.8
Other endocrine disease	20.2	21.4	9.7
Cardiovascular disease	86.3	86.0	89.0
Musculoskeletal disease	45.7	46.9	34.7
Dementia	24.2	24.0	26.1
Neurologic disease other than dementia	25.0	24.0	33.8
Anxiety disorder	14.5	15.3	7.2
Depression	30.3	31.4	19.6
Bipolar disorder	1.8	1.9	1.5
Schizophrenia	1.4	1.2	2.9
Pulmonary disease	24.3	24.8	19.7
Sensory disease	11.0	11.2	9.7
Other	59.5	59.6	58.7
Facility characteristics			
Hospital-based	7.5	7.4	8.4
Profit status			
For-profit	72.8	72.1	78.2
Nonprofit	27.3	27.9	21.8
Government	3.2	3.2	2.5
Chain affiliated	57.9	57.6	60.6
Beds, no.	133.8 (77.4)	130.9 (75.5)	151.2 (91.4)
Admissions of Black patients for postacute care, %	9.9 (16.3)	6.9 (11.2)	37.0 (27.4)
Medicaid residents, %	50.5 (24.2)	49.6 (24.0)	58.9 (24.5)
County characteristics			
Competition ^b	0.8 (0.2)	0.8 (0.2)	0.9 (0.1)
Per capita income, \$1000	37.0 (10.7)	36.9 (10.6)	37.9 (11.6)
Persons aged ≥ 65 y, %	13.5 (3.7)	13.6 (3.8)	12.4 (3.0)
Persons aged ≥ 65 y/nursing home bed	25.4 (12.3)	25.5 (12.5)	24.7 (10.0)
Hospital beds/1000 population	3.5 (2.5)	3.4 (2.4)	4.1 (2.9)
Rural	18.3	19.1	11.6

^aSeven types of activities of daily living were coded 0 (independence) to 4 (total dependence) for a score of 0 to 28.

^bAccording to Herfindahl-Hirschman Index, calculated as the sum of squared shares of nursing home beds for all nursing homes in the county. Market competitiveness scores ranged from 0 (least competition) to 1 (highest competition).

* $P < .001$ for all comparisons between White and Black patients derived from χ^2 test (categorical variables) or t test (continuous variables), except comparison for whether patients were admitted from a hospital ($P = .022$).

72%), to facilities with higher concentrations of Black patients (37% vs 7%) and to facilities with higher percentages of long-term care residents receiving Medicaid benefits (59% vs 50%) than were White patients.

The unadjusted rates of rehospitalization were 14.3% for White patients and 18.6% for Black patients within 30 days of skilled nursing facility admission and 22.1% and 29.5%, respectively, within 90 days of admission (Table 1). These differential rates indicated an overall 40% increased odds of 30-day rehospitalization (Table 2; in the base model, odds ratio [OR]=1.37; 95% confidence interval [CI]=1.35, 1.40; $P < .001$) and an overall 50% increased odds of 90-day rehospitalization (OR=1.48; 95% CI 1.46, 1.50; $P < .001$) associated with Black race.

The overall racial disparity attenuated after sequential adjustment for patient and nursing home covariates (Table 2). ORs were reduced to 1.18 for 30-day rehospitalization and 1.25 for 90-day rehospitalization when we adjusted for patient covariates (model 1), and to 1.06 for 30-day rehospitalization and 1.09 for 90-day rehospitalization when we adjusted for both patient and facility covariates (model 2). The ORs for Black rehospitalization were not further reduced and remained statistically significant ($P < .001$) when we also controlled for county and state covariates, suggesting that persistent racial effects on rehospitalization were independent of the patient, facility, county, and state factors considered in the analyses.

Table 3 presents the predicted hospital admission rates for Black and White patients according to stratified models. For both White and Black patients, younger age, male gender, lower education attainment, and higher physical or cognitive impairment tended to be associated with increased rehospitalization rates. In addition, patients admitted to freestanding (rather than hospital-based) facilities, to facilities with higher concentrations of Medicaid or Black patients, and to larger or for-profit facilities had elevated rehospitalization rates. These results were generally consistent with those of previous studies.^{3,4,24,29,30}

Despite these patient and facility variations in risk of rehospitalization, Black patients had higher hospital admission rates than did White patients in almost all stratified analyses. This

TABLE 2—Racial Disparities in Rehospitalization After Admission to a Skilled Nursing Facility: Nursing Home Minimum Data Set, United States, January–September 2008

Effect of Race (Black vs White)	Rehospitalization	
	Within 30 Days, OR (95% CI)	Within 90 Days, OR (95% CI)
Base model ^a no covariates	1.37* (1.35, 1.40)	1.48* (1.46, 1.50)
Model 1 ^b	1.18* (1.16, 1.20)	1.25* (1.23, 1.27)
Model 2 ^c	1.06* (1.04, 1.08)	1.09* (1.06, 1.11)
Model 3 ^d	1.06* (1.04, 1.09)	1.09* (1.07, 1.11)
Model 4 ^e	1.06* (1.04, 1.09)	1.09* (1.07, 1.11)

Note. CI = confidence interval; OR = odds ratio.

^aNo covariates.

^bPatient covariates.

^cPatient and facility covariates.

^dPatient, facility, and county covariates.

^ePatient, facility, and county covariates, plus state dummies.

* $P < .001$.

racial disparity was particularly pronounced within several subgroups, such as patients with the most difficulties in ADLs (racial difference = 4.9% for 30-day rehospitalization and 8.7% for 90-day rehospitalization) or with cognitive impairment (racial difference = 5.1% and 8.7%, respectively). The disparity was also more evident in freestanding facilities, facilities caring for more Medicaid residents, for-profit facilities, and facilities with more beds.

The final stratified analyses by state found substantial interstate variation in rehospitalization rates (Figure 1). For White patients, the rate ranged from 7% in Washington, DC, to 20% in Louisiana within 30 days of admission, and from 9% in Washington, DC, to 31% in Louisiana within 90 days of admission. Rates for Black patients also differed by state but were higher than for Whites in all the states we examined, and the racial disparities we observed were greater in some areas (such as Washington, DC, and Illinois) than in others.

DISCUSSION

Our analyses revealed that among a cohort of White and Black Medicare patients admitted to US skilled nursing facilities in 2008, Black patients had a 40% higher risk of being rehospitalized within 30 days of admission and a 50% increased risk of being rehospitalized within 90 days of admission. Variations in patient characteristics (demographic, socioeconomic, and clinical) and the type of admitting facilities

may explain a considerable portion of this racial disparity, but the disparity persisted after adjustment for these and other factors and persisted within subgroups of patient and facility types. Finally, despite substantial interstate differences in predicted rehospitalization rates, Black patients tended to have higher rates than did Whites in all states and the District of Columbia.

Although racial disparities in hospitalization of long-term care nursing home residents have been suggested in previous research,^{20–23} ours is the first study, to our knowledge, that comprehensively evaluated racial disparities in skilled nursing facility rehospitalizations. At the micro level, the decision to send a nursing facility patient to a hospital may be affected by a variety of factors, which include the acuity and severity of disease, family and patient preferences, and facility-related factors such as practice routines or ability to respond to emergency situations.^{4,33–35} The persistent racial disparities in the likelihood of hospital readmission may be a manifestation of the underlying differences in these varied factors between racial groups.

The existing literature suggests substantial racial segregation in nursing home care: racial minority patients tend to reside in facilities that have higher percentages of minority residents, are disadvantaged financially (e.g., are heavily reliant on Medicaid reimbursement), and provide poorer-quality care.^{16–19} Our descriptive analyses confirmed these findings for skilled nursing facility admissions (Table 1). Previous

research also established that improved staffing levels of physician assistants and geriatric nurse practitioners in skilled nursing facilities, as well as on-site availability of technological resources such as intravenous therapy or x-rays, effectively reduce their rehospitalization rates.^{33–35} Therefore, the resource-poor facilities that house the majority of Black patients may be more likely to send their patients out to hospitals because they are less able to provide on-site access to medical staff and technological resources in emergencies, which may contribute to the racial disparities we observed.

Our stratified analyses (Table 3) found that facilities that had more Medicaid beneficiaries or more Black patients admitted or were profit driven (and therefore had less incentive to invest in clinical care³⁰) also had higher rehospitalization rates for both White and Black patients. In addition, compared with freestanding facilities, hospital-based skilled nursing facilities may be better staffed by professional nurses³⁶ and have enhanced access to varied clinical resources and thus may experience lower rehospitalization rates.^{3,29} These results provide further evidence that the practice patterns in resource-poor facilities, which serve a disproportionately high number of Black patients, contribute to the racial disparity in hospital readmission rate.

Even within similar types of facilities, however, Black patients had a consistently higher risk of hospital admission than did White patients, and such racial disparities were greater in resource-poor facilities. This risk of hospital admission might be explained by the fact that even in facilities with relatively similar practices, Black patients tend to desire more aggressive and life-sustaining medical treatments than do White patients,^{23,37} which may stem from distrust of the medical care system among minority patients and their desire not to lose access to the health care system. Another possible reason is that compared with White patients, minority patients (and their families) tend to have poorer communication with physicians and other nursing home staff,³⁸ which may impede provider response to patients' altered health conditions, complicate diagnosis and treatment, and thus exacerbate the risk of hospital admission. Taken together, patient and facility factors may explain much of the racial

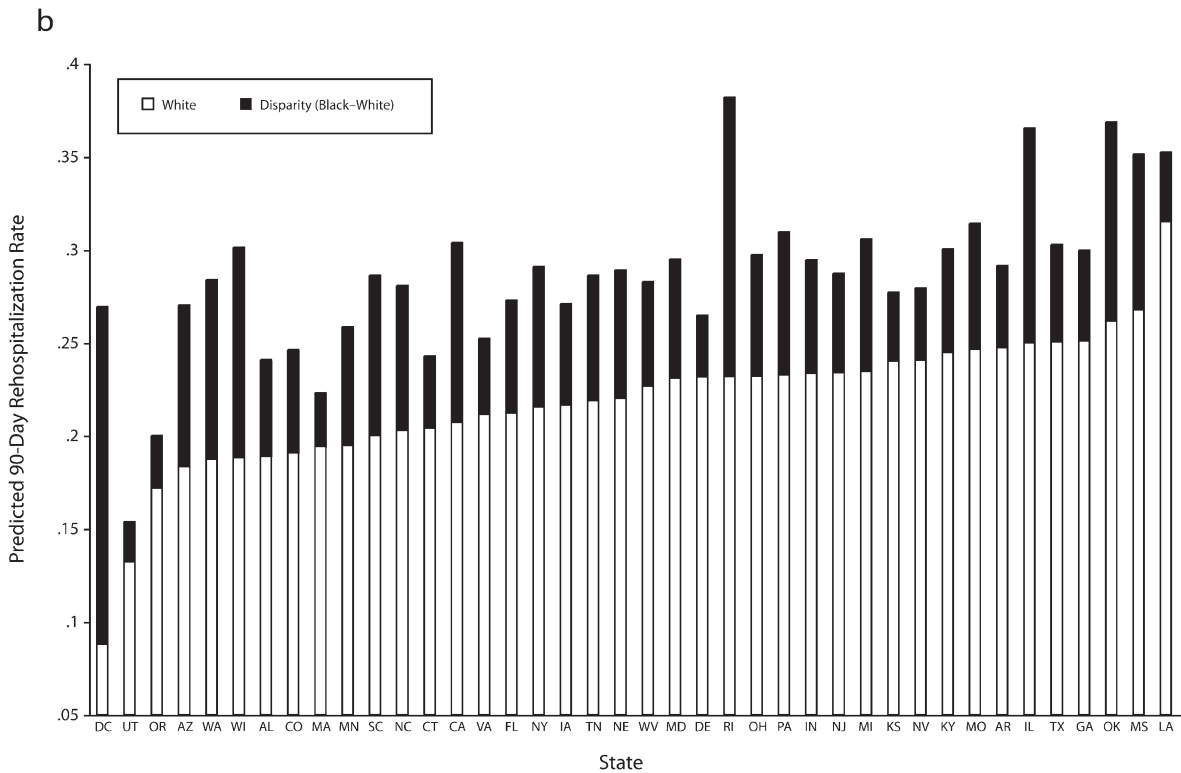
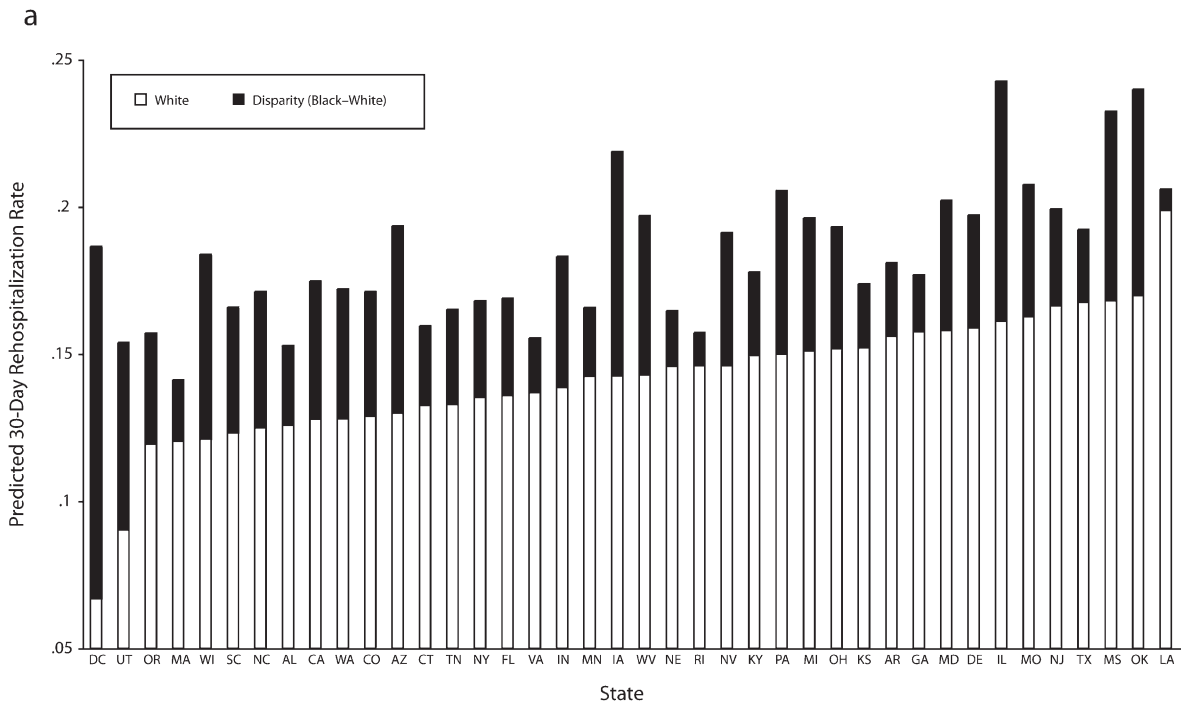
TABLE 3—Predicted Rehospitalization Rates After Admission to a Skilled Nursing Facility Among Black and White Patients, Overall and Stratified by Key Patient and Facility Characteristics: Nursing Home Minimum Data Set, United States, January–September 2008

Stratification Variables	30-Day Rehospitalization Rate			90-Day Rehospitalization Rate		
	White, %	Black, %	Disparity, ^a % (95% CI)	White, %	Black, %	Disparity, ^a % (95% CI)
No stratification	14.3	18.6	4.3 (4.3, 4.4)	22.1	29.5	7.5 (7.4, 7.6)
Patient characteristics						
Age, y						
< 65	14.9	19.1	4.3 (4.1, 4.4)	23.0	29.5	6.5 (6.2, 6.8)
65–74	14.6	19.0	4.4 (4.2, 4.5)	22.0	29.3	7.3 (7.1, 7.5)
75–84	14.3	18.2	3.9 (3.7, 4.0)	21.8	29.0	7.2 (7.0, 7.4)
≥ 85	14.0	18.4	4.4 (4.3, 4.5)	22.2	30.6	8.5 (8.3, 8.6)
Gender						
Women	12.9	17.5	4.6 (4.5, 4.7)	20.2	27.9	7.7 (7.5, 7.8)
Men	16.9	20.3	3.4 (3.3, 3.6)	25.6	32.0	6.5 (6.3, 6.6)
Education						
< High school diploma	15.0	18.5	3.6 (3.5, 3.7)	24.0	30.0	6.0 (5.8, 6.2)
High school diploma	14.4	18.8	4.3 (4.2, 4.5)	22.2	29.6	7.4 (7.2, 7.5)
Some college/technical school	13.3	17.6	4.3 (4.2, 4.5)	20.4	27.5	7.2 (6.9, 7.4)
≥ Bachelor's degree	13.1	16.6	3.4 (3.2, 3.7)	20.0	26.0	6.0 (5.6, 6.4)
Marital status						
Married	15.4	19.4	4.0 (3.8, 4.1)	22.9	29.7	6.9 (6.6, 7.1)
Not married	13.7	18.3	4.6 (4.6, 4.7)	21.7	29.5	7.8 (7.7, 7.9)
Activities of daily living status at admission ^b						
0–7	8.4	11.6	3.2 (3.0, 3.3)	12.8	17.9	5.1 (4.9, 5.4)
8–14	10.3	12.5	2.3 (2.2, 2.3)	15.4	19.2	3.8 (3.7, 4.0)
15–21	14.6	17.3	2.7 (2.7, 2.8)	22.7	27.6	4.9 (4.8, 5.0)
22–28	23.3	28.2	4.9 (4.7, 5.0)	36.5	45.2	8.7 (8.5, 8.9)
Cognitive impairment						
No	13.0	16.5	3.4 (3.4, 3.5)	19.5	25.3	5.8 (5.7, 5.9)
Yes	16.1	21.2	5.1 (4.9, 5.2)	25.9	34.6	8.7 (8.6, 8.9)
Facility characteristics						
Hospital-based	8.6	10.3	1.7 (1.5, 1.8)	11.6	14.6	3.0 (2.8, 3.3)
Freestanding, % of Medicaid residents						
< 25	12.7	16.4	3.7 (3.4, 3.9)	18.5	24.0	5.5 (5.1, 5.8)
25–49	13.8	17.0	3.1 (3.0, 3.3)	20.9	25.7	4.8 (4.6, 5.0)
50–74	15.2	19.1	3.9 (3.8, 4.0)	24.1	30.7	6.6 (6.4, 6.7)
≥ 75	16.4	21.6	5.1 (5.0, 5.3)	26.9	35.3	8.4 (8.2, 8.7)
Profit status						
For-profit	15.0	19.7	4.7 (4.6, 4.8)	23.5	31.4	7.9 (7.8, 8.0)
Nonprofit	12.6	15.1	2.5 (2.4, 2.7)	18.8	23.5	4.8 (4.6, 5.0)
Government	12.5	15.4	3.0 (2.5, 3.4)	19.8	24.5	4.7 (4.0, 5.4)
Chain affiliation						
Yes	14.6	18.8	4.2 (4.1, 4.3)	22.7	29.8	7.1 (6.9, 7.2)
No	13.7	18.3	4.5 (4.4, 4.6)	21.1	29.1	8.0 (7.8, 8.1)
Beds, no.						
< 50	9.5	9.5	-0.1 (-0.2, 0.1)	13.2	12.7	-0.6 (-0.8, -0.3)
50–99	14.1	18.4	4.3 (4.1, 4.4)	22.0	29.8	7.8 (7.6, 8.0)
100–149	14.9	19.0	4.1 (4.0, 4.2)	23.1	30.1	7.0 (6.9, 7.2)
≥ 150	14.9	19.8	4.9 (4.7, 5.0)	23.3	31.6	8.3 (8.1, 8.5)
Admissions of Black patients for postacute care, %						
< 5	14.2	16.1	2.0 (1.8, 2.2)	21.6	24.8	3.2 (2.9, 3.5)
5–14	14.9	16.7	1.8 (1.7, 1.9)	23.2	26.4	3.3 (3.1, 3.5)
15–29	15.4	18.1	2.6 (2.5, 2.8)	24.4	28.3	3.9 (3.7, 4.2)
≥ 30	17.0	19.9	2.9 (2.7, 3.0)	27.1	31.9	4.9 (4.7, 5.1)

Note. CI = confidence interval. Predicted rates were based on logistic regression models that controlled for patient, facility, county, and state covariates except for the variable used for stratification.

^aBlack-White.

^bSeven types of activities of daily living were coded 0 (independence) to 4 (total dependence) for a score of 0 to 28.



Note. States are sorted by rate for White patients, which is the bottom part of the histogram; the top part of each histogram highlights disparity for Black patients. States (Alaska, Hawaii, Idaho, Maine, Montana, North Dakota, New Hampshire, New Mexico, South Dakota, Vermont, and Wyoming) with fewer than 50 Black admissions were not included in the stratified analyses.

FIGURE 1—Rehospitalization rates for Black and White skilled nursing facility patients by state at (a) 30 and (b) 90 days: Nursing Home Minimum Data Set, United States, January–September 2008.

disparity, as suggested by the analyses shown in Table 2.

Although we are unsure why states varied substantially in rehospitalization rates, recent studies suggest that systematic differences in state or local practice norms² and in state nursing home regulations²⁴ play a role. Our study contributes to the literature by showing that in addition to the overall variation in state rehospitalization rates, Black nursing facility patients in all states and the District of Columbia experienced more frequent hospital admissions than did White patients, and the magnitude of this racial disparity was more pronounced in some areas.

Policies aimed at reducing rehospitalization of elderly people and the associated Medicare expenditures have been proposed. The Medicare bundled payment for an episode of care across settings (such as hospitals, postacute care facilities, and physician offices)⁹ is designed to provide financial incentives for better across-setting care coordination and to reduce excessive rehospitalizations and other inefficient uses of resources. In addition, the ongoing Centers for Medicare and Medicaid demonstration of pay for performance is designed to determine the impact of performance-based reimbursements on nursing home quality and Medicare expenditures.³⁹ One of the targeted areas of performance is reduction of inappropriate hospitalizations, and its resulting Medicare savings would be used to financially reward facilities with the best performance.

Our findings suggest that reducing racial disparities in nursing home quality should be another important policy goal in addition to these well-designed initiatives for global quality improvement. Individual facilities, especially those serving mostly minority patients, may lack necessary resources or expertise to improve care quality and have to rely to a greater extent on resource-rich settings, such as hospitals, to serve their patients. As a result, performance-based approaches to quality improvement may unfairly penalize these facilities. Interventions targeting these facilities and their minority patients would be another cost-effective way to reduce rehospitalization and its associated racial disparities.

Limitations

We focused on hospital admissions as an important performance indicator for skilled

nursing facilities. In light of the multidimensional nature of nursing home care,⁴⁰ the issue of racial disparities may not be generalizable to other performance areas. We focused only on non-Hispanic Whites and Blacks in nursing facilities; we excluded patients of other races/ethnicities because of small sample sizes, which prevented accurate comparisons, especially in stratified analyses.

Finally, although we performed detailed multivariable and stratified analyses, we had no way to control for other patient and facility variables, such as patient preferences (although our analyses excluded those with a do-not-hospitalize order and controlled for whether a do-not-resuscitate order was present at admission) and facility practice patterns. Understanding the role of these and other factors in racial disparities in skilled nursing facility rehospitalization will be important in addressing this issue, although it will require in-depth investigation beyond the scope of our study.

Conclusions

Among a national cohort of White and Black patients admitted to skilled nursing facilities, we found that Black race was associated with a 40% increased risk of rehospitalization within 30 days of admission and a 50% increased risk of rehospitalization within 90 days of admission. This racial disparity was largely explained by patient characteristics and facility types, but it persisted after we controlled for these factors in both the overall cohort and subgroups of patients. In the context of current efforts to reduce the overall rehospitalization rate in this vulnerable population, our findings suggest that targeted interventions to address racial disparities could play an important role. ■

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Contributors

Y. Li conceptualized and designed the study, obtained the data, and drafted and revised the article. L. G. Glance helped design the study, interpret results, and revise the article. J. Yin performed statistical analyses, presented results, and helped draft and revise the method and result sections of the article. D. B. Mukamel helped design the study, analyze data, and revise the article.

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This study was approved by the institutional review boards of the University of Iowa and the University of California, Irvine.

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