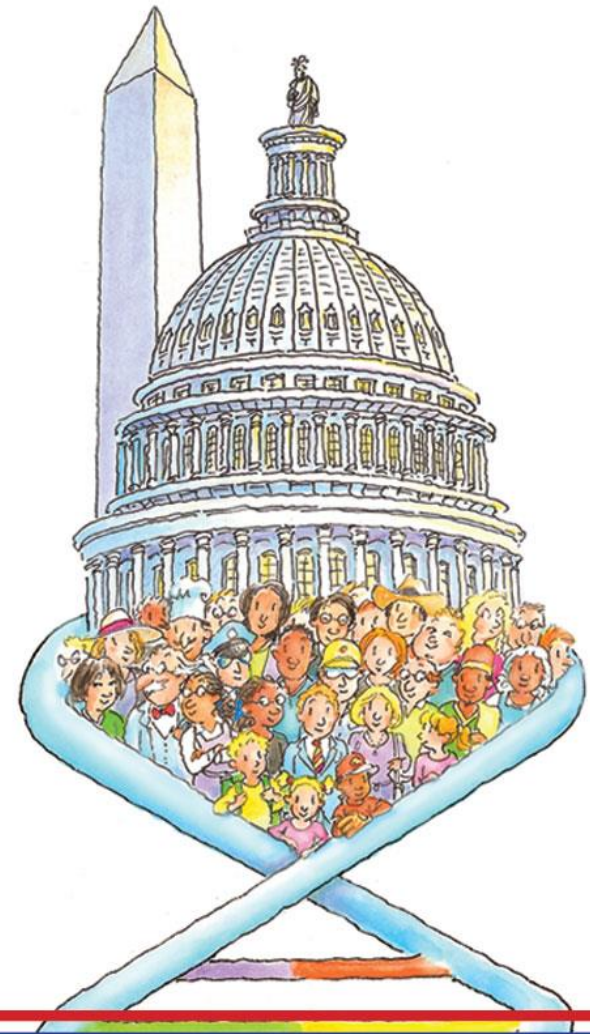


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Making Connections: From Cells to Societies



Racial/Ethnic Patient Mix in Hospitals: Impact on Readmissions and Financial Performance

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Background

- Research suggests that site of care is a predictor of racial/ethnic disparities in care
- Minority-serving institutions are oftentimes teaching hospitals and resource constrained
- Policies that financially penalize hospitals for higher readmission rates may exacerbate racial/ethnic disparities in care



Research Objective

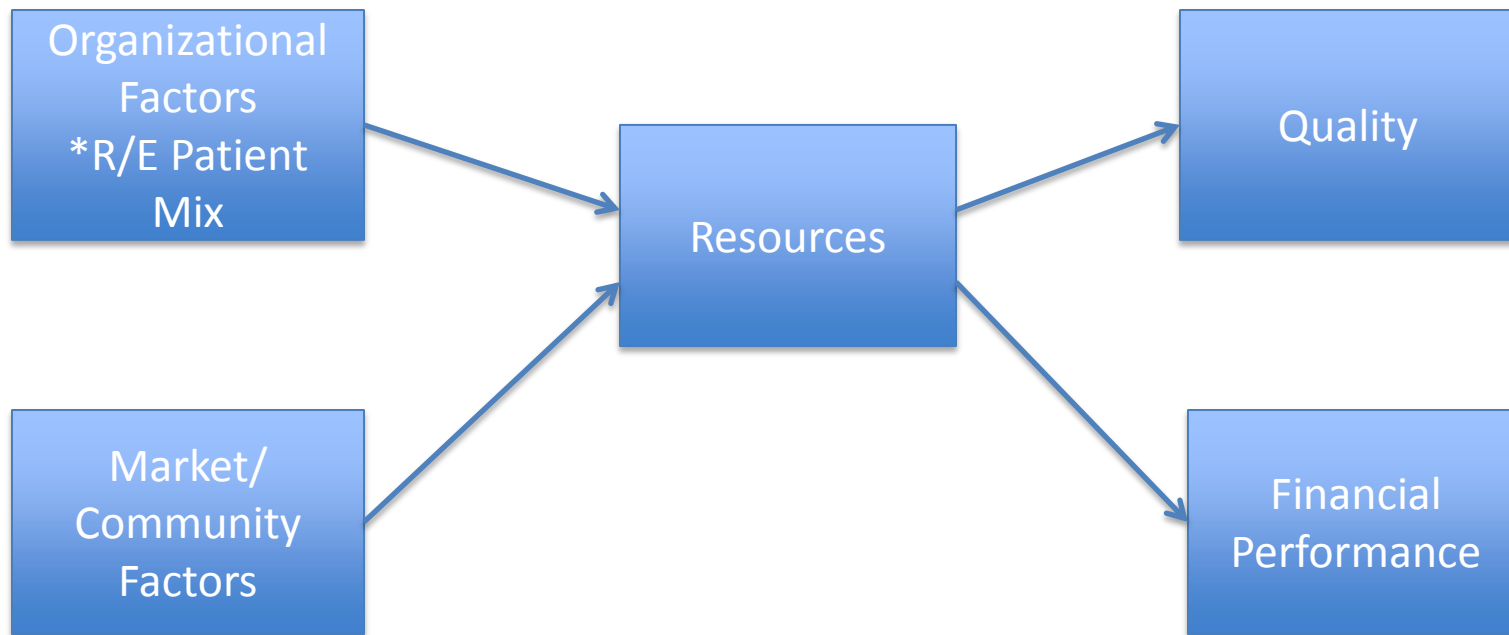
- Assess the relationship between racial/ethnic patient mix and hospital's financial and quality performance
- Unit of analysis hospital



Conceptual Framework

- Resource Dependence Theory
 - Organizational strategic response to environmental pressures to attract resources
 - Organizational slack facilitates accommodations to environmental demands
 - Hospitals with a higher proportion of minorities may have
 - More uninsured patients
 - Greater dependence on Medicaid
 - Private insurance patients may avoid hospitals with high Medicaid and uninsured
 - Less resources may result in both lower quality and lower financial performance

Racial/Ethnic Patient Mix and Hospital Performance





Data and Sample

- 2007 and 2008 data for hospitals in California, Florida, and New York
- Data Sources
 - HCUP State Inpatient Database
 - American Hospital Association Annual Survey
 - Medicare Cost Reports
 - Area Resource File
- Sample
 - 888,700 admissions for acute myocardial infarction (AMI), heart failure, and pneumonia
 - 68% White, 9% Black, 11% Hispanic, 4% Asian, 7% Other



Dependent Variables

- Number of hospital readmissions (log transformed) using algorithm
 - Overall
 - Acute myocardial infarction
 - Heart failure
 - Pneumonia
- Financial performance
 - Operating margin (operating income/operating revenue)
 - Total margin (net income/total revenue)



Independent Variable and Control Variables

- Racial/ethnic patient mix-
 - % total admissions
 - Non-Hispanic Whites (reference)
 - Non-Hispanic Blacks
 - Hispanics
 - Non- Hispanic Asian
 - Other
- Organizational factors
 - Ownership
 - System Member
 - Teaching
 - Beds
 - Total number of admissions
- Market/Community factors (county)
 - Competition (Herfindahl Index)
 - Unemployment rate
 - % poverty
 - Per capita income
 - % Racial/ethnic minorities
 - % age 65+
 - Medicare managed care penetration
 - % low education (8th or less)
 - PCP per 1000 pop.
 - Metropolitan area
- Year and state fixed effects



Analysis

- Multi-level model (Proc Mixed)
 - First level: organizational variables
 - Second level: county variables
- State and year fixed effects
- Stratified by race/ethnicity: White, Black, Hispanic, Asian, Other

Racial/Ethnic Patient Mix of Hospital Inpatients by State, 2008

Race/ ethnicity		California			Florida			New York		
		Total admissions	30-day readmissions	%	Total admissions	30-day readmissions	%	Total admissions	30-day readmissions	%
	White	99,043	13,881	14.0%	96,736	13,134	13.5%	80,977	11,254	13.9%
	Black	13,022	2,319	22.5%	17,156	2,583	15.1%	17,140	2,645	15.4%
	Hispanic	29,549	4,108	13.9%	11,407	1,605	14.1%	10,673	1,587	14.9%
	Asian	12,157	1,898	15.6%	630	71	11.2%	2,928	381	13.0%
	Other	3,312	467	14.1%	4,977	850	17.1%	7,969	997	12.5%
	Total	157,083	22,673	14.4	130,906	18,243	13.9%	119,687	16,864	14.1%

Note: Only includes patients with a primary diagnosis of AMI, HF, and pneumonia.

Source: State Inpatient Database, 2008

Regression Results for 30-day Readmissions – Overall¹

	Whites	Blacks	Hispanics	Asians	Other
% Black	0.38***	44.81***	1.67***	1.28	1.02
% Hispanic	0.17***	1.33	30.12***	1.33	0.77
% Asian	0.54*	10.83***	4.39***	395.09***	1.07
% Other	0.07***	1.11	0.40***	0.86	292.66***

¹After adjusting for organizational and market characteristics

All-cause readmissions for AMI, HF, and Pneumonia admissions

Coefficients represent Exp(beta). *** p < 0.001; ** p < 0.001; * p < 0.01

Regression Results for 30-day Readmissions – AMI¹

	Whites	Blacks	Hispanics	Asians	Other
% Black	0.12***	59.12***	1.08	1.39	1.15
% Hispanic	0.10***	2.00**	24.24***	1.50	0.84
% Asian	0.12***	3.85**	2.44**	54.84***	1.12
% Other	0.11***	2.16*	0.73	0.81	87.25***

¹After adjusting for organizational and market characteristics

All cause readmissions for AMI admissions

Coefficients represent Exp(beta). *** p < 0.001; ** p < 0.001; * p < 0.01

Regression Results for 30-day Readmissions – Heart Failure¹

	Whites	Blacks	Hispanics	Asians	Other
% Black	0.16***	88.22***	1.09	2.18**	0.97
% Hispanic	0.10***	1.45*	28.69***	1.54	1.48
% Asian	0.13***	4.29***	3.29***	154.51***	2.69
% Other	0.48***	2.33**	1.92*	1.49	120.76***

¹After adjusting for organizational and market characteristics

All cause readmissions for Heart Failure admissions

Coefficients represent Exp(beta). *** p < 0.001; ** p < 0.001; * p < 0.01

Regression Results for 30-day Readmissions – Pneumonia¹

	Whites	Blacks	Hispanics	Asians	Other
% Black	0.29***	45.16***	1.85**	1.13	1.12
% Hispanic	0.12***	1.34	20.45***	1.45	1.17
% Asian	0.12***	1.50	1.74	154.86***	0.66
% Other	0.38***	1.78	1.05	1.85	85.04***

¹After adjusting for organizational and market characteristics

All cause readmissions for Pneumonia admissions

Coefficients represent Exp(beta). *** p < 0.001; ** p < 0.001; * p < 0.01

Regression Results for Financial Performance

	Total Margin Beta	Operating Margin Beta
% Black	-0.057*	-0.154*
% Hispanic	-0.062**	-0.347***
% Asian	0.046	0.109
% Other	-0.061*	-0.049

¹After adjusting for organizational and market characteristics

*** p < 0.001; ** p < 0.001; * p < 0.01



Summary of Results

- Increased racial/ethnic patient mix is associated with higher 30-day readmissions for both Whites and minorities among patients with AMI, HF, and pneumonia
- Increased proportion of Blacks and Hispanics is associated with lower financial performance in terms of both operating and total margin



Conclusions

- Hospitals serving a more diverse patient mix on average are more under-resourced and experience higher 30-day readmissions
- Potential unintended consequences of financial penalties for hospitals based on higher readmission rates



Policy Implications

- Affordable Care Act
 - Financial penalties for hospitals with high readmission rates may exacerbate racial/ethnic disparities
 - Increasing insurance rates, particularly in states with Medicaid expansion. Larger effect on minorities.
 - Reductions in Disproportionate Share Hospital payments
- Quality improvement initiatives should target hospitals serving more vulnerable populations
- Risk-adjustment of payment for racial/ethnic patient mix?



Limitations

- Readmission rates were not risk-adjusted
- Limited to two years of analysis and three states
- Study focused on hospital overall financial performance rather than patient level costs
- Future research should explore the impact of quality improvement strategies targeting hospitals with large vulnerable populations



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