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Healthcare Safety-Net in the United States: Patient Satisfaction across Rural and Urban Hospitals

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HEALTHCARE SAFETY-NET IN THE UNITED STATES: PATIENT SATISFACTION ACROSS RURAL AND
URBAN HOSPITALS

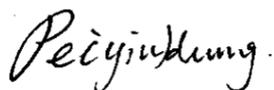
By

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ABSTRACT

Objective. To examine rurality and other hospital characteristics associated with patient satisfaction across hospitals in the United States.

Data. Nationwide hospital data from the 2019 Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey and the 2020 Centers for Medicare & Medicaid Services (CMS) Provider of Services (POS) file.

Study Design. Hospital ZIP-codes were categorized into urban, rural micropolitan, or small/isolated rural based on Rural-Urban Commuting Area (RUCA) codes. Patient satisfaction measures from the HCAHPS survey were linked to the CMS POS data for hospital characteristics, yielding 2,357 urban hospitals, 749 rural micropolitan, and 1,343 small/isolated rural hospitals. ANOVA and chi-square tests were conducted to compare patient satisfaction measures and hospital characteristics by rurality. Generalized linear models were employed to examine marginal differences of hospital rurality on patient satisfaction, controlling for other hospital characteristics.

Principal Findings. While small/isolated rural hospitals were less likely to be accredited, to have medical school affiliation, and to have high staffing, they were more likely to have pharmacy services collocated within a hospital, patients insured by Medicare and Medicaid, and critical access hospital (CAH) designations. Small/isolated rural hospitals had the highest average survey response rates at 3.26 percentage points above the national average. In particular, compared to urban hospitals, small/isolated rural hospitals had higher percentages of patients reporting that nurses or doctors always communicated well (average marginal effects: 1.63; 95% CI, 1.14-2.12

(nurses) and 2.61 [2.12-3.10] (doctors)), that they always received help as soon as they wanted (4.36 [3.56-5.16]), and that staff always explained possible side effects (3.28 [2.50-4.06]).

Conclusions. Safety-net, or small/isolated rural, hospitals reported higher patient satisfaction compared to non-safety-net hospitals. Many of these safety-net hospitals were designated as CAH, relied more on Medicare and Medicaid insurance, and offered on-site pharmaceutical services. These findings signal the important role that safety-net hospitals play in providing satisfactory healthcare to underserved communities.

INTRODUCTION

Healthcare Safety-Net

The healthcare “safety-net” plays a critical role in the United States’ healthcare model by filling in coverage gaps to provide affordable healthcare to low-income populations. However, this system is not without flaws. The healthcare safety-net is neither well-defined nor consistent. The safety-net encompasses a wide range of public hospitals, free clinics, private physicians, local health departments, and other medical providers.¹ Depending on the needs of the surrounding community and the political climate of the area, each institution varies greatly in the breadth of services provided and the financing options offered.¹

The lack of agreement on what constitutes a safety-net provider complicates the issue. One prior study proposed three general approaches to defining whether a facility is considered a safety-net: a demonstrated commitment and contribution to uncompensated care within a community, a Medicare and Medicaid caseload greater than or equal to the state average, or facility characteristics such as being a public or teaching hospital.² Another study defined safety-net providers as those in the highest quartile of the Disproportionate Share Hospital (DSH) index, as hospitals designated as DSH serve a significantly disproportionate number of low-income patients and receive uncompensated care payments from the Centers for Medicaid and Medicare Services in return.³

Much of this research has been focused on the urban safety-net, yet the role of safety-net hospitals is particularly important in rural America, which comprises approximately 60 million Americans.⁴ As of 2019, approximately 16.0% of adults in rural America lacked health insurance, and rural areas continue to be 3 percentage points higher than urban areas in uninsurance rates.⁵

The medical care of these people thus depends on the rural safety-net. Unlike the urban safety-net, which relies heavily on teaching hospitals and other professional academic programs that use trainees to provide care for low-income patients, the rural safety-net has less access to such resources.⁶ The rural safety-net includes a range of individual providers like rural health clinics, private practices, community health centers, and local health departments.⁶ One other rural provider, the critical access hospital (CAH), is of particular importance.

Critical Access and Rural Hospitals

As of January 2022, 1,356 rural hospitals are designated as “critical access” hospitals, an official classification for select rural hospitals that receive additional financial and resource incentives for providing care to rural, underserved communities.^{7,8} In order to qualify as a CAH, a facility generally must have 25 or fewer beds, be located 35 miles or more from the next neighboring hospital, maintain an average length of stay of less than 4 days, and offer 24/7 emergency care services.⁹ Although not all rural hospitals have this critical access designation, most do—over 60% of rural hospitals are CAHs.⁷ In general, rural hospitals also receive more of their revenue from Medicare (45%) and Medicaid (11%) compared to urban hospitals.¹⁰ Thus, in addition to being critical access, many rural hospitals have a large proportion of uncompensated care and Medicaid caseloads, satisfying two definitions of “safety-net” proposed in prior literature.

Furthermore, rural hospitals fulfill such an important healthcare role that, when there is a lack of availability, their absence is clearly felt. Since 2010, more than 106 rural hospitals in the U.S. have closed, resulting in a significant loss of population coverage.¹¹ When a rural hospital closes, low-income and elderly patients report higher likelihoods of postponing or forgoing

medical care because of transportation challenges.¹² In addition to scarcity of transportation, rural residents face many more barriers to healthcare than individuals in urban areas. Rural America is often plagued by a shortage of trained medical professionals, lack of services, lower health literacy, and poor availability of internet services.¹³ Combining these issues with cultural differences and financial constraints, rural residents experience poorer health outcomes than urban residents.¹⁴

Because of these barriers, many rural residents are unable or less likely to seek out medical care. In fact, one study found that residence in a rural area increased the likelihood for healthcare avoidance, even when controlling for other factors.¹⁵ Patient satisfaction can be examined in rural hospitals to determine its role in encouraging rural residents to seek care.

Patient Satisfaction

In the ever-changing healthcare landscape of limited resources and multiple priorities, patient satisfaction remains a significant indicator of quality care. Patient satisfaction positively influences clinical outcomes, patient loyalty and compliance, and medical malpractice claims.¹⁶ Thus, patient satisfaction is an effective measure of hospital and clinical success. One method of measuring patient satisfaction is through the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey. This survey instrument was developed in 2002 by the Agency for Healthcare Research and Quality (AHRQ) as the first national, standardized, and publicly reported measurement of patients' perceptions of hospital care.¹⁷ Previously, many hospitals had collected patient satisfaction data for internal use, but the introduction of HCAHPS enabled inter-hospital comparisons to be made at the local, regional, and national level.

The Health Services Resources and Administration (HRSA), the primary federal agency for improving healthcare access for medically vulnerable people, has included HCAHPS as part of their Medicare Beneficiary Quality Improvement Project (MBQIP).¹⁸ MBQIP aims to improve the quality of care in CAHs using HCAHPS data to drive performance.¹⁹ The inclusion of HCAHPS shows the merit of using patient satisfaction as an indicator of hospital performance.

Rural-Urban Disparities

Yet, research regarding patient satisfaction is currently limited. Research regarding rural-urban disparities on patient satisfaction is even more scarce. One relevant study found that, compared to urban hospitals, rural hospitals were less likely to have a clean hospital environment but were more likely to have quick staff responsiveness and room quietness.²⁰ When controlling for other individual- and facility-level characteristics, there was evidence that higher RN staff levels and teaching hospital status predicted higher likelihoods of patient satisfaction.²⁰ Larger facility size resulted in a mixed effect, as it was positively associated with cleanliness and responsiveness but negatively associated with quietness.²⁰

Other research has similarly corroborated the positive effects of higher nurse-staffing levels on patient experience. In fact, nursing communications accounted for 75% of the variance in patient satisfaction scores in one study.²¹ This is unsurprising, as nurses spend far more time with patients than physicians and other staff members.²² However, studies also found that physician communication was often highly correlated with overall hospital rating, suggesting that nurse and physician communication may have a larger impact on patient satisfaction than other hospital characteristics.²³

A variety of other studies have been conducted that indicate potential disparities in rural versus urban hospitals. One study found that the highest performers in patient satisfaction were likely small, rural, or government-owned hospitals.²⁴ Another study discovered that, after controlling for other hospital-level covariates, academic hospitals outperformed nonacademic hospitals in most HCAHPS measures.²⁵ Since an aforementioned study claims that the urban safety-net depends on teaching and academic hospitals, this suggests that urban hospitals have more satisfied patients than rural hospitals.⁶

The Current Study

There is a clear gap in the literature regarding rural-urban disparities in patient satisfaction. The factors that may influence patient satisfaction are still uncertain. Many patient-level factors—such as patient perception of pain management—or hospital-level factors—such as hospital location—may affect patient satisfaction.²⁶ Research on patient satisfaction disparities across rurality and its causes is limited, especially as conducting rural health research in general remains challenging due to research barriers.²⁷ More research is needed to examine patient satisfaction in rural hospitals and whether certain hospital characteristics like rurality indeed affect reported patient satisfaction. Thus, the objective of our study is two-fold: to examine hospital characteristic differences by rurality, and to examine the role of hospital location rurality on patient satisfaction. In doing so, rurality and other hospital characteristics may illuminate patient satisfaction disparities. If patient satisfaction is found to be more positive in rural hospitals compared to urban hospitals, the important role those rural hospitals play in the healthcare safety-net can be highlighted.

METHODS

Data and Study Design

The 2019 HCAHPS data were used to investigate differences in patient satisfaction by rurality. The HCAHPS survey is a standardized, publicly reported measurement of patients' perceptions of hospital care that is administered to a random sample of recently discharged patients. It consists of 29 questions: 22 questions that cover the hospital experience (care from nurses, care from doctors, hospital environment, care from staff, discharge information, overall rating of the hospital, and care transition) and then 7 questions to adjust for demographics.²⁸ For our study, the last 7 questions were excluded because they are not directly related to hospital performance. Of the first 22 questions, three were intended to skip patients to the next appropriate question; these three questions were also excluded from our study.

The remaining 19 HCAHPS questions fall under 10 measures: 6 composite measures (nurse communication, doctor communication, staff responsiveness, communication about medication, discharge information, and care transition), 2 individual items (room cleanliness and quietness), and 2 global items (hospital rating and hospital recommendation). Each of the six composite measures is derived from two or three closely related questions. For our study, both the 19 individual questions and 6 composite measures were examined, as the composites allow for quick review of patient perceptions and increase statistical reliability.

Outside of the global items, the survey questions use a standard set of response options: "never," "sometimes," "usually," and "always;" "yes" and "no;" or "strongly disagree," "disagree," "agree," and "strongly agree." Because we were interested in examining positive patient satisfaction, only the most positive response options were used: "always," and "strongly

agree.” The most positive response options for the two global items were also used: “9” and “10,” and “definitely yes.”

The Centers for Medicare & Medicaid Services (CMS) Provider of Services (POS) file released in 2020 was also used to compare hospital characteristics by rurality. The file consists of data collected from nationwide hospitals on the type of services they provide and other hospital characteristics.²⁹ Based on prior literature, ten hospital characteristics were identified from the file to have particular association with patient satisfaction: CAH, ownership type, accreditation type, pharmacy service, medical school affiliation, Medicare and Medicaid participation, state code, LPN/LVN count, physician count, and RN count.²⁶ States were categorized in our study into United States Census Regions (Northeast, Midwest, South, and West) for better review of results.

Using “Facility ID” as the common identifier, HCAHPS measures were linked to our identified hospital characteristics, yielding 4,449 hospitals. Hospital ZIP-codes were used to categorize these hospitals by rurality into urban, rural micropolitan, or small/isolated rural based on Rural-Urban Commuting Area (RUCA) codes.³⁰

Statistical Analyses

Bivariate analyses examined whether there were differences in hospital characteristics by rurality and whether there were differences in patient satisfaction by rurality, using chi-square tests of independence for categorical variables and one-way analysis of variance for continuous variables as appropriate. Because our outcomes of interest were linear and normally distributed, we employed generalized linear models to examine the association between hospital rurality and each of the patient satisfaction measures. Urban hospitals were used as the reference group, and all models were controlled for the other ten identified hospital characteristics. All statistical

analyses were done using Excel and SAS Version 9.5. Additionally, because this study used publicly available, secondary data sources, Institutional Review Board (IRB) review and approval were not required.

RESULTS

As seen in Appendix Table 1, urban hospitals were the most abundant nationwide with 2,357 hospitals, followed by small/isolated rural hospitals with 1,343 hospitals and then rural micropolitan hospitals with the least abundance at 749 hospitals. Out of all hospital types, small/isolated rural hospitals had the highest average survey response rates to the HCAHPS survey at 3.26 percentage points above the national average.

Table 1 shows differences in hospital characteristics by rurality. While urban and rural micropolitan hospitals were less likely to be designated as a CAH (4.9% and 22.5%, respectively), the majority of small/isolated rural hospitals were considered CAH (77.2%). Across all hospitals, 56.6% of hospitals were private for-profit. However, small/isolated rural hospitals were the most likely to be public hospitals (36.4%) compared to urban (16.2%) and rural micropolitan (26%). Urban and rural micropolitan hospitals were more likely to be accredited (89.7% and 79.1%, respectively), while only 37.1% of small/isolated rural hospitals had accreditation by Joint Commission or DNV. For availability of pharmacy services, small/isolated rural hospitals were more likely to offer them (97.3%) than urban and rural micropolitan hospitals (89.7% and 94.5%). Only 25.9% of hospitals nationwide were affiliated with a medical school. However, small/isolated rural hospitals had the lowest affiliation (7.2%) compared to urban and rural micropolitan hospitals (37.3% and 18.0%). The majority of hospitals nationwide participated in

Medicare and Medicaid (93.6%), but small/isolated rural hospitals had the highest participation (98.8%) versus urban and rural micropolitan counterparts (90.5% and 95.8%, respectively). Across the nation, the Northeast generally had the lowest abundance of hospitals (12.3%), while the South had the highest (37.6%). Small/isolated rural hospitals slightly differed by having their highest number of hospitals in the Midwest (43.1%). Small/isolated rural hospitals also had the lowest staffing counts compared to the national mean for LPNs/LVNs (7.1 versus 17.7), physicians (5.4 versus 21.2), and RNs (33.6 versus 242.6).

Table 2 displays differences in reported patient satisfaction by rurality. For all HCAHPS patient experience items, small/isolated rural hospitals consistently reported higher patient satisfaction than the national average—indicating better performance than urban and rural micropolitan hospitals combined. For example, patients in small/isolated rural hospitals reported experiencing better average communication with nurses (84.3) and doctors (85.6) than the national average (80.8 and 81.4 for nurses and doctors, respectively), and small/isolated rural patients also reported receiving quicker responses for help (76.9 versus 69.4 nationally). In general, urban hospitals were almost always below national average in reported patient satisfaction, while rural micropolitan hospitals usually scored slightly above national average but still lower than small/isolated rural hospitals. Some exceptions include patients' understanding of care after discharge, as both urban and rural micropolitan hospitals (52.6 and 52.3, respectively) reported lower average patient satisfaction than nationally (53.4). Similarly, urban (71.9) and rural micropolitan (71.4) patients gave fewer "9" or "10" hospital ratings in comparison to the national average (72.9). However, urban hospitals did report higher scores than the national average for one HCAHPS question: patients' recommendation of the hospital. For this

measure, urban hospitals (72.0) had a higher average than nationally (71.8), and rural micropolitan hospitals (68.1) were below average.

Table 3 shows the marginal differences in patient satisfaction by hospital rurality based on generalized linear models, where all models controlled for CAH designation, ownership type, accreditation type, pharmacy service availability, medical school affiliation, Medicare and Medicaid participation, census region, LPN/LVN count, physician count, and RN count. After controlling for these differences, patient satisfaction scores were consistently higher in small/isolated rural hospitals. In particular, compared to urban hospitals, small/isolated rural hospitals had higher percentages of patients reporting that nurses always communicated well (1.63 [1.14-2.12]), that doctors always communicated well (2.61 [2.12-3.10]), that they always received help as soon as they wanted (4.36 [3.56-5.16]), and that staff always explained possible side effects (3.28 [2.50-4.06]). Additionally, many patients reported that rooms were always clean (2.65 [1.94-3.36]) and quiet at night (2.76 [1.88-3.64]). Rural micropolitan hospitals followed a similar trend with positive marginal effects when compared to urban hospitals for these HCAHPS measures. However, there were some exceptions with negative marginal effects. For example, compared to urban hospitals, small/isolated rural hospitals had lower percentages of patients reporting that they would definitely recommend the hospital (-3.33 [-4.29--2.37]).

Table 1. Hospital characteristics in 2020 by hospital rurality

Hospital Characteristics	Nationally (N=4,882)	Urban (N=2,744)	Rural Micropolitan (N=784)	Small/ Isolated Rural (N=1,348)	P value (chi-square test)
	Number (Percent)				
Critical Access Hospital					<.001
Yes	1,349 (27.6%)	133 (4.9%)	176 (22.5%)	1,040 (77.2%)	
No	3,533 (72.4%)	2,611 (95.2%)	608 (77.6%)	308 (22.9%)	
Ownership Type					<.001
Public Hospitals	1,143 (23.4%)	445 (16.2%)	204 (26.0%)	491 (36.4%)	
Private Non-Profit Hospitals	899 (18.4%)	648 (23.6%)	123 (15.7%)	126 (9.4%)	
Private For Profit Hospitals	2,762 (56.6%)	1,590 (57.9%)	444 (56.6%)	727 (53.9%)	
Accreditation Type					<.001
Yes	3,582 (73.4%)	2,460 (89.7%)	620 (79.1%)	500 (37.1%)	
No	1,271 (26.0%)	265 (9.7%)	158 (20.2%)	844 (62.6%)	
Pharmacy Service					<.001
Yes	4,518 (92.6%)	2,460 (89.7%)	741 (94.5%)	1,311 (97.3%)	
No	364 (7.5%)	284 (10.4%)	43 (5.5%)	37 (2.7%)	
Medical School Affiliation					<.001
Yes	1,262 (25.9%)	1,023 (37.3%)	141 (18.0%)	97 (7.2%)	
No	3,620 (74.2%)	1,509 (55.0%)	610 (77.8%)	1,235 (91.6%)	

Table 1 (Continued)

Hospital Characteristics	Nationally (N=4,882)	Urban (N=2,744)	Rural Micropolitan (N=784)	Small/ Isolated Rural (N=1,348)	P value (chi-square test)
	Number (Percent)				
Medicare and Medicaid Participation					<.001
Yes	4,571 (93.6%)	2,482 (90.5%)	751 (95.8%)	1,332 (98.8%)	
No	311 (6.4%)	262 (9.6%)	33 (4.2%)	16 (1.2%)	
Census Region					<.001
Northeast	592 (12.3%)	433 (16.1%)	65 (8.3%)	94 (7.0%)	
Midwest	1,431 (29.7%)	588 (21.9%)	263 (33.6%)	580 (43.1%)	
South	1,815 (37.6%)	1,080 (40.1%)	307 (39.2%)	428 (31.8%)	
West	984 (20.4%)	590 (21.9%)	149 (19.0%)	245 (18.2%)	
Hospital Characteristics	Mean (Standard Deviation)				P value (ANOVA)
LPN/LVN Count	17.7 (45.0)	23.7 (58.6)	16.6 (21.1)	7.1 (10.8)	<.001
Physician Count	21.2 (100.3)	32.4 (130.7)	11.8 (42.3)	5.4 (34.3)	<.001
RN Count	242.6 (1040.2)	391.8 (1391.1)	121.2 (154.2)	33.6 (35.8)	<.001

Table 2. Patient satisfaction from 2019 Hospital Consumer Assessment of Healthcare Providers and Systems survey by hospital rurality

HCAHPS Answer Description	Nationally (N=4,449)	Urban (N=2,357)	Rural Micropolitan (N=749)	Small/Isolated Rural (N=1,343)	P value
	Mean (Standard Deviation)				
Nurses always communicated well [†]	80.8 (5.4)	79.3 (5.2)	81.1 (4.4)	84.3 (5.1)	<.001
Nurses always treated patients with courtesy and respect	86.9 (4.8)	85.7 (4.6)	87.5 (3.9)	90.1 (4.2)	<.001
Nurses always listened carefully	77.7 (6.0)	76.2 (5.8)	78.2 (5.1)	81.6 (5.7)	<.001
Nurses always explained things so patients could understand	76.7 (5.5)	75.5 (5.1)	77.1 (4.9)	80.3 (5.4)	<.001
Doctors always communicated well [†]	81.4 (5.5)	79.7 (4.8)	81.6 (4.6)	85.6 (5.6)	<.001
Doctors always treated patients with courtesy and respect	87.1 (4.4)	86.0 (4.0)	87.4 (3.9)	90.5 (4.1)	<.001
Doctors always listened carefully	79.4 (5.8)	77.8 (5.1)	79.8 (5.1)	84.0 (5.8)	<.001
Doctors always explained things so patients could understand	76.6 (5.9)	74.9 (5.1)	77.1 (5.1)	81.5 (6.0)	<.001
Patients always received help as soon as they wanted [†]	69.4 (9.4)	66.0 (8.4)	70.8 (7.4)	76.9 (8.6)	<.001
Patients always received call button help as soon as they wanted	67.3 (9.8)	64.1 (8.9)	69.1 (8.1)	75.5 (8.5)	<.001

Table 2 (Continued)

HCAHPS Answer Description	Nationally (N=4,449)	Urban (N=2,357)	Rural Micropolitan (N=749)	Small/Isolated Rural (N=1,343)	P value
	Mean (Standard Deviation)				
Patients always received bathroom help as soon as they wanted	69.8 (8.5)	67.1 (7.6)	71.7 (7.0)	76.3 (8.1)	<.001
Staff always explained [†]	65.5 (7.0)	63.7 (6.2)	65.7 (5.8)	69.7 (7.8)	<.001
Staff always explained new medications	78.3 (5.7)	77.2 (5.2)	78.6 (5.0)	81.6 (6.5)	<.001
Staff always explained possible side effects	51.8 (7.9)	50.0 (7.1)	52.4 (7.0)	56.9 (8.7)	<.001
Staff gave patients information [†]	87.1 (4.2)	86.6 (3.8)	87.6 (3.7)	87.8 (5.3)	<.001
Staff gave patients information about help after discharge	85.1 (5.0)	84.5 (4.6)	85.6 (4.7)	86.4 (6.1)	<.001
Staff gave patients information about possible symptoms	89.1 (3.6)	88.6 (3.4)	89.6 (3.3)	90.1 (4.2)	<.001
Patients strongly agree they understood their care when they left the hospital [†]	53.4 (7.2)	52.6 (6.9)	52.3 (6.4)	56.3 (7.5)	<.001
Patients strongly agree that staff took their preferences into account	46.3 (7.5)	45.5 (7.4)	45.4 (6.6)	49.6 (7.7)	<.001
Patients strongly agree they understood their responsibilities when they left the hospital	52.5 (7.1)	51.9 (6.9)	51.2 (6.4)	55.6 (7.3)	<.001

Table 2 (Continued)

HCAHPS Answer Description	Nationally (N=4,449)	Urban (N=2,357)	Rural Micropolitan (N=749)	Small/Isolated Rural (N=1,343)	P value
	Mean (Standard Deviation)				
Patients strongly agree they understood their medications when they left the hospital	60.3 (7.0)	59.6 (6.7)	59.4 (6.4)	63.2 (7.4)	<.001
Room was always clean	75.3 (7.9)	72.7 (6.9)	76.5 (6.8)	80.9 (7.8)	<.001
Room was always quiet at night	61.5 (10.4)	59.0 (10.1)	61.8 (8.6)	67.6 (9.7)	<.001
Patients gave a rating of "9" or "10" (high)	72.9 (8.8)	71.9 (8.5)	71.4 (8.0)	76.4 (9.2)	<.001
Patients would definitely recommend the hospital	71.8 (9.8)	72.0 (9.5)	68.1 (9.5)	74.1 (10.2)	<.001

Notes: P values were calculated using one-way analysis of variance.

† Composite measure derived from closely related questions.

Table 3. Generalized linear models for patient satisfaction by rurality

HCAHPS Answer Description	Urban	Rural Micropolitan		Small/Isolated Rural	
		Average Marginal Effects (95% CI)	P value	Average Marginal Effects (95% CI)	P value
Nurses always communicated well [†]	ref.	0.67 (0.26, 1.08)	0.0014	1.63 (1.14, 2.12)	<.0001
Nurses always treated patients with courtesy and respect	ref.	0.87 (0.50, 1.24)	<.0001	1.54 (1.07, 2.01)	<.0001
Nurses always listened carefully	ref.	0.80 (0.33, 1.27)	0.0008	1.91 (1.32, 2.50)	<.0001
Nurses always explained things so patients could understand	ref.	0.64 (0.21, 1.07)	0.0038	2.03 (1.48, 2.58)	<.0001
Doctors always communicated well [†]	ref.	0.90 (0.51, 1.29)	<.0001	2.61 (2.12, 3.10)	<.0001
Doctors always treated patients with courtesy and respect	ref.	0.68 (0.35, 1.01)	<.0001	2.09 (1.66, 2.52)	<.0001
Doctors always listened carefully	ref.	0.97 (0.54, 1.40)	<.0001	3.04 (2.49, 3.59)	<.0001
Doctors always explained things so patients could understand	ref.	1.22 (0.79, 1.65)	<.0001	3.67 (3.12, 4.22)	<.0001
Patients always received help as soon as they wanted [†]	ref.	2.69 (2.02, 3.36)	<.0001	4.36 (3.56, 5.16)	<.0001
Patients always received call button help as soon as they wanted	ref.	2.32 (1.73, 2.91)	<.0001	5.07 (4.15, 5.99)	<.0001
Patients always received bathroom help as soon as they wanted	ref.	2.84 (2.21, 3.47)	<.0001	3.97 (3.17, 4.77)	<.0001

Table 3 (Continued)

HCAHPS Answer Description	Urban	Rural Micropolitan		Small/Isolated Rural	
		Average Marginal Effects (95% CI)	P value	Average Marginal Effects (95% CI)	P value
Staff always explained [†]	ref.	0.82 (0.27, 1.37)	0.003	2.37 (1.72, 3.02)	<.0001
Staff always explained new medications	ref.	0.46 (-0.01, 0.93)	0.0498	1.45 (0.86, 2.04)	<.0001
Staff always explained possible side effects	ref.	1.23 (0.62, 1.84)	<.0001	3.28 (2.50, 4.06)	<.0001
Staff gave patients information [†]	ref.	0.54 (0.19, 0.89)	0.0023	0.17 (-0.24, 0.58)	0.4256
Staff gave patients information about help after discharge	ref.	0.48 (0.07, 0.89)	0.0217	0.29 (-0.24, 0.82)	0.2824
Staff gave patients information about possible symptoms	ref.	0.53 (0.22, 0.84)	0.0007	0.52 (0.13, 0.91)	0.0094
Patients strongly agree they understood their care when they left the hospital [†]	ref.	-1.54 (-2.11, -0.97)	<.0001	-0.21 (-0.90, 0.48)	0.5500
Patients strongly agree that staff took their preferences into account	ref.	-1.55 (-2.16, -0.94)	<.0001	-0.31 (-1.09, 0.47)	0.4393
Patients strongly agree they understood their responsibilities when they left the hospital	ref.	-1.88 (-2.45, -1.31)	<.0001	-0.0 (-0.79, 0.67)	0.8640
Patients strongly agree they understood their medications when they left the hospital	ref.	-1.30 (-1.87, -0.73)	<.0001	0.15 (-0.58, 0.88)	0.6815

Table 3 (Continued)

HCAHPS Answer Description	Urban	Rural Micropolitan		Small/Isolated Rural	
		Average Marginal Effects (95% CI)	P value	Average Marginal Effects (95% CI)	P value
Room was always clean	ref.	1.93 (1.34, 2.52)	<.0001	2.65 (1.94, 3.36)	<.0001
Room was always quiet at night	ref.	0.42 (-0.32, 1.16)	0.2679	2.76 (1.88, 3.64)	<.0001
Patients gave a rating of "9" or "10" (high)	ref.	-2.29 (-3.00, -1.58)	<.0001	-0.85 (-1.69, -0.01)	0.0507
Patients would definitely recommend the hospital	ref.	-5.58 (-6.38, -4.78)	<.0001	-3.33 (-4.29, -2.37)	<.0001

Notes: All models controlled for all hospital characteristics in Table 1.

Bold font is used to highlight statistically significant P values < 0.05.

† Composite measure derived from closely related questions.

DISCUSSION

Summary of Results

In this sample of 4,449 hospitals in 2019, we sought to examine the variations in patient satisfaction domains by hospital rurality in hopes of identifying the patient perceptions toward safety-net, or small/isolated rural, hospitals in the United States healthcare system. We found that small/isolated rural hospitals were unlikely to be accredited and to have medical school affiliation, and they had lower staffing numbers compared to urban and rural micropolitan hospitals. However, small/isolated rural hospitals were more likely to offer pharmacy services, to have patients insured by Medicare and Medicaid, and to be CAH designated. The majority of small/isolated rural hospitals were also located in the Midwest.

Despite low likelihoods of being accredited and lower workforce, our study discovered that small/isolated rural hospitals had higher patient satisfaction than urban and rural micropolitan hospitals, indicating that patients discharged from safety-net hospitals reported higher satisfactory scores than those from non-safety-net hospitals. In particular, compared to urban hospitals, small/isolated rural hospitals were more likely to have patients report that nurses or doctors always communicated well, that they always received help as soon as they wanted, and that staff always explained possible side effects. However, measures of discharge information and transition of care were not statistically different between urban and rural micropolitan or small/isolated rural hospitals.

Prior Studies

Our study helps fill in the gaps in the literature on the effects of rural and safety-net classifications on patient satisfaction. When one prior study by Chatterjee and colleagues

examined patient satisfaction in safety-net hospitals in 2012, defining safety-net hospitals as those in the DSH index, their findings suggested that safety-net hospitals measured worse than non-safety-net hospitals in nearly all HCAHPS measures of the patient experience.³ This contrasts with our study, as we found that safety-net hospitals consistently measured higher than non-safety-net hospitals. This notable variability in findings could be explained by a variety of factors, such as improvements to healthcare since the year 2012 of the Chatterjee et al. study, the lower number of CAHs that reported HCAHPS in 2012, and the different definitions of what constitutes a “safety-net” facility. However, another study by McHugh and colleagues showed that by broadening the definition of “safety-net,” specifically to encompass any facility that provides a high percentage of uncompensated care, results were more mixed.² Looking at the impact of rurality or geographic location on patient satisfaction provided a clearer consensus. Some studies have found that primary healthcare satisfaction is higher in rural areas than urban areas.³¹ Even after adjusting for other socioeconomic factors, the association between rurality and satisfaction with hospitalization outcomes remains significant.³²

Beyond rurality, studies have been conducted on the role of other hospital characteristics on patient satisfaction. Certain factors like well-managed pain and non-for-profit status resulted in increased patient satisfaction.²⁶ These results appear to be consistent with our own, as we found that small/isolated rural hospitals had more patients reporting satisfaction with pain management and were more likely than the national average to have non-profit status. In general, the availability of more healthcare services had a significant and positive impact on patient satisfaction by allowing patients to fulfill all of their healthcare needs at a single location.³³ Generally, urban hospitals are likelier to have more resources and thus offer more

services, but our data did show that small/isolated rural hospitals were the most likely to offer pharmacy services.

One prior study found teaching status or number of beds did not have a significant association with patient satisfaction, which appeared to be consistent with our results.¹⁶ We found that small/isolated rural hospitals were the least likely to be affiliated with a medical school (suggesting lack of teaching status) and had the lowest staffing numbers (suggesting fewer number of beds) of all other hospitals. However, other studies have shown teaching status to have a positive impact on patient satisfaction. An aforementioned study saw academic hospitals outperform non-academic hospitals in patient satisfaction, and another study found that the introduction of medical students to a hospital improved patient satisfaction.^{25,34} This coincides with the fact that urban hospitals are more likely than rural hospitals to have medical training programs, as rural hospitals report difficulties with recruitment of physician preceptors, isolation experienced by students, and problems with scheduling transportation and housing for these physicians and students.³⁵ Other factors like location in a metropolitan area and larger size of facility clearly decreased patient satisfaction.^{16,36} Larger hospital size was correlated with lower patient satisfaction, particularly in patients' perceptions of timeliness in receiving help, room cleanliness, and doctor communication.³⁶ Our data supports these findings, since we found that rural hospitals reported higher satisfaction in those three measures despite being smaller in size. In fact, smaller CAHs have reported better staff responsiveness than larger CAHs by several percentage points.³⁷ This is reasonable, as staff in lower-volume hospitals can spend more time with each patient and provide more individualized care, consistent with findings that show a positive correlation between time spent with patients and patient satisfaction.³⁸

In the overall context of rural healthcare, rural hospitals have several advantages for patient satisfaction. Rural hospitals in our study were reported to have better communication with nurses, doctors, and staff and quicker response times. Because these facilities are often smaller than their non-rural counterparts, nurses, doctors, and staff can offer individualized care to each patient. An exploration of the rural physician experience confirms that they spend more time with patients and often provide care beyond the usual scope of practice.³⁹ It is also reasonable that our results found rural hospitals to be more likely to have cleaner and quieter rooms, as these hospitals are located away from dense, high-traffic environments. However, rural hospitals had poor or inconclusive results for measures of discharge information and transition of care. Rural nurses are less likely than urban nurses to hold a baccalaureate nursing degree and more likely to have received continuing education through online courses.⁴⁰ Studies have also found that health literacy is significantly lower in rural populations than urban populations, a possible explanation for why rurality did not have a significant effect on patient satisfaction measures of understanding discharge information.⁴¹ Similarly, transition of care may be challenging due to the large geographical distances between medical facilities and scarcity of public transport in rural areas. In fact, half of rural patients who were prescribed specialist referrals did not complete their referrals due to transportation obstacles.⁴² Despite limitations in staffing, infrastructure, and resources, small and critical access hospitals have unique factors that contribute to improved quality of care.⁴³ They are often tight-knit communities that emphasize collaboration, and staff members are usually multidisciplinary to overcome staff capacity needs and financial constraints.^{43,35}

Limitations

Key strengths of this study include the large sample size, suggesting that findings may be fairly representative of hospitals nationwide. This study also adds to the thus far limited body of literature surrounding safety-net and/or rural hospitals and their effects on patient satisfaction. However, there were several study limitations. The HCAHPS survey which comprised much of our data is a retrospective patient self-report, which may allow opportunities for errors in memory that would affect reported satisfaction. Based on Appendix Table 1, response rates to the survey were modest and thus may result in nonresponse bias; it is possible that patients that experienced satisfaction on the extremes (either very satisfied or very dissatisfied) were more inclined to complete the survey than patients who experienced average satisfaction.

Patient satisfaction is also in itself a subjective measure, so different individuals may have different perceptions of what “satisfaction” means. Although we controlled our generalized linear models for a variety of other hospital characteristics, it is highly likely that patient satisfaction is impacted by many more variables outside of these. Given the nature of the cross-sectional study design, this study provides compelling evidence on rural-urban differences in hospital patient satisfaction in 2019; future research is warranted to examine the trends of hospital patient satisfaction across rural and urban hospitals, as well as the underlying factors for hospital patient satisfaction with better data to conclude causality.

Future Implications

Approximately 60 million Americans live in rural areas and face barriers to accessing quality medical care.⁸ This study provides evidence that rurality impacts patient satisfaction and thus has far-reaching implications for these 60 million Americans. Despite several government programs offering financial support, rural hospitals are at a disadvantage when compared to

larger, less isolated hospitals, resulting in the growing number of rural hospital closures that critically endanger the communities which they serve.⁴⁴ Rural hospitals have fewer financial and human resources, offering opportunities for future research on how to fund and how to attract experienced healthcare professionals to these institutes that are so vital to community health.⁴⁵ Rural hospitals must also overcome a challenging demographic of aging patients whom are often less educated and at increased risk of poverty; more research is needed to examine exactly how best to treat this particular population.⁴⁶

Despite all of these obstacles, our study has shown that rural hospitals perform highly in patient satisfaction. Patient satisfaction is an established and effective measure of clinical success, showing that rural hospitals are clinically important.¹⁶ While we have demonstrated rurality's effect on the patient experience, there are infinite characteristics from the patient-level to the hospital-level that future studies can examine.¹⁶ For instance, racial differences in patient satisfaction have been reported, with white populations being the most satisfied and Hispanic populations being the least.⁴⁷ Racial and ethnic minority populations often face more challenges in the healthcare setting due to racism or cultural incompetency by healthcare providers and lack of resources like interpretation services.^{48,49} Our study did not account for race or other demographic factors, which is a potential avenue for further research.⁵⁰

The definition of "safety-net" can be further expanded in future studies. In addition to encompassing rural hospitals as we did or uncompensated care, high Medicare and Medicaid case load, facility characteristics, or the DSH index like other studies, research can be done on other healthcare providers such as Federally Qualified Health Centers, Rural Health Clinics, Community Health Centers, or state public health departments.^{2,3} With our own study showing a

safety-net system with positive outcomes, the importance of these institutions in maintaining the health of vulnerable and uninsured communities cannot be overstated. Because safety-net systems are often the only option for these groups of people, access to patient-centered care is particularly important in these rural settings.

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APPENDIX**TABLE 1.** HCAHPS survey response rates

	Number of Hospitals	Average	Standard Deviation	P value (ANOVA)
Urban	2,357	24.40	9.13	<.001
Rural Micropolitan	749	24.13	7.67	
Small/Isolated Rural	1,343	28.62	9.17	
Nationally	4,449	25.36	9.08	