

Use of Postacute Care After Discharge in Urban and Rural Hospitals

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ABSTRACT

OBJECTIVES: Geographic variation in the use of postacute care (PAC)—specifically, skilled nursing facility and home healthcare—after hospital discharge is substantial, but reasons for this remain largely unexplored. PAC use in urban hospitals compared with rural hospitals may be a key contributor. We aimed to describe PAC use, explore substitution of one type of PAC for another, and identify how PAC use varies by diagnosis in urban and rural settings.

STUDY DESIGN: Secondary analysis of the 2012 National Inpatient Sample, including adult discharges to PAC after a hospitalization.

METHODS: We adjusted for differences in patient demographics, comorbidities, hospital care provided, and hospital information, comparing the use of PAC in urban and rural settings in multivariable logistic regression.

RESULTS: Rural patients discharged from rural hospitals constituted 188,137 (12.1%) of the 1.56 million discharges in the sample. Rural discharges received less home healthcare (odds ratio [OR], 0.85; 95% confidence interval [CI], 0.80-0.90) than urban discharges, resulting in less rural PAC use overall (OR, 0.95; 95% CI, 0.91-0.99). Rural discharges received more overall PAC for stroke (OR, 1.11; 95% CI, 1.03-1.19) and less PAC for sepsis (OR, 0.92; 95% CI, 0.86-0.98), hip fracture (OR, 0.82; 95% CI, 0.70-0.96), and elective joint arthroplasty, where rural discharges had 41% lower odds of receiving PAC (OR, 0.59; 95% CI, 0.49-0.71).

CONCLUSIONS: The striking differences in receipt of postacute care in urban and rural patients may constitute a disparity. Evaluation of costs and outcomes of PAC use in these settings is urgently needed as Medicare expands bundled payments for this care.

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Use of postacute care (PAC), such as skilled nursing facility (SNF) and home healthcare (HHC), is increasing rapidly for patients discharged from the hospital.^{1,2} PAC is now the most rapidly growing area of Medicare spending, but this growth is not uniform.^{3,4} Instead, geographic variability in PAC use explains the vast majority of geographic differences in Medicare spending across the United States, and geographic differences are stable over time.^{5,6} An underexplored area that may significantly contribute to this variability is how PAC use differs in urban and rural hospitals nationally.

The location of the patient and the discharging hospital may have a strong influence on whether and what type of PAC is used. The location of the nearest SNF to the hospital has been shown to influence the use of that facility.⁷ Medicare's "swing bed" policy, which allows critical access hospitals to convert an inpatient hospital bed into a rehabilitation bed during a patient's stay, has strongly increased use of this care in rural areas.⁸⁻¹² However, significant gaps in understanding this important area remain. Most studies of urban and rural PAC use consider only Medicare patients, despite the important roles that other payers play.^{13,14} Studies that consider both the patient's and hospital's location are scarce, although they both plausibly affect PAC use.^{15,16} Finally, prior studies also have not considered whether use of PAC in urban and rural areas may vary by diagnosis, despite evidence of differential use of PAC based on diagnosis type in other settings.¹⁷⁻²⁰

We sought to evaluate how PAC is used by hospitals in urban and rural areas across the United States, exploring whether there is evidence of a substitution effect of one type of PAC (eg, home healthcare) for another (eg, SNF care). We also wished to explore how this

varies among patients treated for different conditions. In doing so, we hoped to provide insights into underlying mechanisms behind geographic variation in PAC use, and provide preliminary data for future studies evaluating costs, appropriateness, and outcomes of PAC in urban and rural settings.

METHODS

Study Design and Participants

This was a secondary analysis of the 2012 National Inpatient Sample (NIS), a nationally representative sample of discharges from hospitals in 44 states that participate in the Health Care Cost and Utilization Project (HCUP).²¹ In 2012, NIS covered more than 95% of the US population and more than 94% of community hospitals; long-term acute care hospitals (LTACHs) were excluded. We included all hospital discharges of patients 18 years or older in 2012. Patients who died during the hospitalization were excluded, as were admissions for neonatal or maternal care, or those that ended with transfer to another hospital.

Urban and rural location of patient residence was defined using the 2006 National Center for Health Statistics classification scheme¹⁵: patients residing in metropolitan counties (counties of 50,000 or more people) were considered urban and patients residing in nonmetropolitan counties were considered rural. Similarly, hospitals residing in counties that are considered metropolitan by Core-Based Statistical Area are classified in the NIS as urban; hospitals in nonmetropolitan counties were considered rural. Rural patients who were hospitalized at urban hospitals ($n = 429,052$; 8.3%) and urban patients hospitalized in rural hospitals ($n = 44,053$; 0.9%) were also excluded from this analysis as they may denote nonrepresentative patient populations being discharged from these hospitals.

Postdischarge care is defined in the NIS as a discharge that is either “routine” (no PAC), involves HHC, or is categorized as “other transfers, including SNF, intermediate care, and another type of facility.” This designation is used to connote discharge to an SNF or swing bed, and specifically excludes transfers to hospitals, LTACHs, and inpatient rehabilitation facilities, which are captured elsewhere. The NIS does not distinguish between community SNF beds and swing beds. We excluded transfers to other short-term hospitals, and patients who left against medical advice or were discharged to an unknown location. The NIS captures only the most proximate source of admission (transfer from another hospital or the emergency department); thus, we were unable to accurately capture prior living situation, such as long-term care facilities.

Discharge records were abstracted for patient demographic information (eg, age, sex, race/ethnicity, marital status, median income of residents in their home residence zip code), comorbidities, hospitalization information (eg, urgency, length of stay, source of admission), primary payer (eg, Medicare [including Medicare Advantage], Medicaid, private payers), hospital information (eg, ownership, size, geographic location according to 9 boundaries defined by the NIS), discharge disposition, and primary discharge diagnosis (from *Internation-*

tional Classification of Diseases, Ninth Revision, Clinical Modification, grouped into Agency for Healthcare Research and Quality Clinical Classification Software [CCS] categories).²² The CCS category “osteoarthritis” in our sample included more than 94% elective admissions, and more than 93% had a Current Procedural Terminology code for a hip or knee replacement; thus, “elective joint arthroplasty” was used as a more appropriate label for this diagnostic category.

Data Analysis

We first evaluated the differences between rural patients discharged from rural hospitals and urban patients discharged from urban hospitals to PAC as we hypothesized these may represent distinct populations of patients, and compared both patient and hospital characteristics. We used HCUP-provided survey weights to produce nationally representative estimates in all analyses; weights can be understood as the number of discharges that a sample discharge represents. These weights account for clustering at the hospital level. Given the very large sample size, we did not use statistical testing as most comparisons would be statistically significant, but rather, we reported absolute differences in the 2 groups.

We then identified the 10 most common hospital discharge diagnoses that preceded PAC use in both urban and rural hospitals and the associated hospital length of stay preceding a PAC stay in order to establish whether possible differences in use of PAC may be related to differences in hospital length of stay. Next, we calculated rates of discharge to home, HHC, and SNF overall and within diagnostic categories, using the 10 diagnoses. Finally, we analyzed the relationship between use of PAC and urban/rural location within diagnostic categories, adjusting for patient and hospital characteristics in multivariable logistic regression. We evaluated SNF use and HHC use individually, then combined them into an overall PAC use variable to evaluate whether the overall use of PAC was similar despite differences in use of SNFs and HHC in different locations. In these comparisons, discharges home are the reference category. Hospital size was collinear with geographic location (rural regions generally had smaller hospitals) and was therefore not included in the regression.

RESULTS

Urban/Rural Patient Characteristics

Our total sample comprised 1.56 million discharges of urban patients discharged from urban hospitals and rural patients discharged from rural hospitals that, when weighted, represented 7.8 million discharges nationally. Of this 1.56 million, 188,137 (12.1%) were rural patients discharged from rural hospitals to PAC (either HHC or SNF care). Rural patients discharged to PAC were more commonly white, poor, and hospitalized in a government facility. There were small differences between the groups in other characteristics (see **Table 1**).

Diagnoses Treated in Urban/Rural Patients Prior to PAC

Rural patients discharged to PAC were more frequently hospitalized for pneumonia, congestive heart failure, urinary tract

Table 1. Characteristics of Patients Discharged to PAC^{a,b}

Characteristic	Rural Hospital	Urban Hospital	Difference	Characteristic	Rural Hospital	Urban Hospital	Difference
	Rural Patient n = 188,137 (12.1)	Urban Patient n = 1,371,159 (87.9)					
	% (95% CI)	% (95% CI)	%				
Patient Characteristics				Length of stay			
Age, years: mean	74.4 (74.2-74.6)	71.1 (70.9-71.3)	3.3	Median, days	5.8 (5.7-5.9)	7.0 (7.0-7.1)	-1.2
18-49	5.5 (5.2-5.8)	9.2 (9.0-9.4)	-3.7	Same-day admission and discharge	0.1 (0.0-0.1)	0.1 (0.0-0.1)	0
50-64	15.6 (15.2-16.0)	20.7 (20.4-20.9)	-5.1	1-2 days	15.3 (14.8-15.8)	14.6 (14.3-14.8)	0.7
65-79	35.0 (34.6-35.4)	33.9 (33.8-34.1)	1.1	3-7 days	63.2 (62.6-63.8)	56.0 (55.7-56.3)	7.2
≥80	43.9 (43.2-44.6)	36.2 (35.8-36.7)	7.7	>7 days	21.0 (20.3-21.8)	29.0 (28.6-29.3)	-8.0
Female	60.8 (60.4-61.2)	57.8 (57.6-58.0)	3.0	Number of chronic conditions			
Race				Median number	6.4 (6.3-6.5)	6.8 (6.7-6.8)	-0.4
White	88.4 (87.1-89.6)	73.3 (72.3-74.4)	15.1	Congestive heart failure	18.6 (18.1-19.1)	15.4 (15.2-15.6)	3.2
Black or African American	6.6 (5.9-7.4)	14.3 (13.6-15.0)	-7.7	Chronic pulmonary disease	27.9 (27.3-28.4)	23.9 (23.6-24.1)	4.0
Hispanic	2.4 (1.7-3.4)	7.1 (6.5-7.7)	-4.7	Cancer	6.1 (5.9-6.3)	7.1 (7.0-7.3)	-1.0
Asian or Pacific Islander	0.5 (0.3-0.9)	1.9 (1.7-2.2)	-1.4	Renal failure	18.4 (17.9-18.9)	19.4 (19.2-19.7)	-1.0
Native American	0.8 (0.5-1.3)	0.4 (0.3-0.5)	0.4	Liver disease	1.9 (1.9-2.0)	2.9 (2.9-3.0)	-1.0
Other	1.2 (0.8-1.7)	3.0 (2.5-3.6)	-1.8	Hospital Characteristics			
Median household income, \$				Ownership			
1-38,999	60.3 (57.6-62.9)	23.3 (22.4-24.3)	37	Government, nonfederal	21.5 (19.3-24.0)	8.1 (7.5-8.6)	13.4
39,000-47,999	30.9 (28.7-33.2)	23.3 (22.5-24.1)	7.6	Private, nonprofit	63.9 (61.4-66.3)	77.6 (76.7-78.5)	-13.7
48,000-62,999	7.7 (6.6-9.0)	27.3 (26.5-28.0)	-19.6	Private, for-profit	14.6 (13.1-16.2)	14.3 (13.6-15.1)	0.3
≥63,000	1.2 (0.8-1.8)	26.2 (25.0-27.4)	-25.0	Geographic region of hospital			
Type of admission				New England	4.5 (3.3-5.9)	7.0 (6.3-7.7)	-2.5
Elective	24.0 (22.7-25.3)	21.1 (20.5-21.7)	2.9	Middle Atlantic	8.2 (6.8-9.9)	18.6 (17.7-19.6)	-10.4
Nonelective	76.0 (74.7-77.3)	78.9 (78.3-79.5)	-2.9	East North Central	16.7 (14.9-18.7)	17.4 (16.6-18.3)	-0.7
Expected payer				West North Central	13.1 (11.8-14.6)	5.2 (4.7-5.8)	7.9
Medicare	83.4 (82.7-84.0)	74.2 (73.7-74.7)	9.2	South Atlantic	19.1 (17.3-21.0)	20.4 (19.5-21.3)	-1.3
Medicaid	5.2 (4.9-5.5)	7.0 (6.8-7.3)	-1.8	East South Central	16.7 (14.3-19.4)	4.8 (4.2-5.5)	11.9
Private	8.5 (8.0-9.1)	15.4 (15.0-15.9)	-6.9	West South Central	14.2 (12.9-15.7)	9.0 (8.5-9.6)	5.2
Self-pay	11.0 (10.0-12.1)	14.0 (13.0-15.1)	-3.0	Mountain	3.9 (3.4-4.5)	5.0 (4.6-5.5)	-1.1
No charge	0.1 (0.0-1.4)	1.2 (0.1-1.5)	-1.1	Pacific	3.7 (3.1-4.4)	12.6 (11.9-13.2)	-8.9
Other	1.8 (1.5-2.2)	1.8 (1.7-1.9)	0	Hospital size (number of beds)			
Source of admission				Small	16.9 (15.7-18.2)	14.6 (13.9-15.4)	2.3
Transfer from hospital	3.3 (2.7-3.9)	4.6 (4.3-4.9)	-1.3	Medium	18.8 (17.3-20.4)	27.0 (26.4-28.3)	-8.2
Transfer from other health facility, including long-term care	5.9 (5.1-6.7)	5.9 (5.6-6.4)	0	Large	64.3 (62.2-66.4)	58.1 (57.0-59.2)	6.2
Not a transfer	90.9 (89.8-91.8)	89.5 (89.0-90.0)	1.4				

CI indicates confidence interval; PAC, postacute care.

^aThe number of chronic conditions is reported as a median, and the difference represents the difference between median total number of chronic conditions.

^bIndividual chronic conditions (eg, congestive heart failure) are reported as the proportion of the sample with that condition.

infections, and chronic obstructive pulmonary disease, whereas urban patients more frequently underwent elective joint arthroplasty. Urban patients had longer hospital lengths of stay for most diagnoses (Table 2).

Factors Influencing Use of PAC in Urban and Rural Hospitals

When all the factors from Table 1 (patient demographic characteristics, health factors, hospital ownership, and regional location) were incorporated into a multivariable model, rural patients at rural hospitals were slightly less likely to receive PAC overall (odds ratio [OR], 0.95; 95% confidence interval [CI], 0.91-0.99). The index hospital length of stay, patient age, sex, and race/ethnicity, as well as whether the admission was elective, had the strongest associations with use of PAC (Table 3). However, there were significant differences within diagnostic categories (Table 4). Rural patients at rural hospitals received more overall PAC services for acute cerebrovascular accident (OR, 1.11; 95% CI, 1.03-1.19), and less frequently receive any PAC for sepsis (OR, 0.92; 95% CI, 0.86-0.98), hip fracture (OR, 0.82; 95% CI, 0.70-0.96), and particularly for elective joint arthroplasty (OR, 0.59; 95% CI, 0.49-0.71).

Overall PAC Use in Urban/Rural Patients

Rural patients at rural hospitals received significantly more SNF care and significantly less HHC overall in 6 of the top 10 most commonly treated diagnoses (Table 4). The main differences in this pattern were for elective joint arthroplasty and acute hip fracture, where rural patients received less SNF care and less HHC than urban patients. The other 4 diagnoses (acute cerebrovascular accident, sepsis, hip fracture, and elective joint arthroplasty), demonstrated overall similar use of PAC between urban and rural sites.

DISCUSSION

Geographic variation in the use of postacute care explains the majority of geographic variation in Medicare spending, yet the reasons for this variability are underexplored. In this analysis, we found that rural patients discharged from rural hospitals were overall more likely to receive SNF or swing bed care after hospital discharge, and less likely to receive HHC, but will receive similar amounts of PAC overall when compared with urban patients. However, significant differences were revealed within diagnostic categories. The most striking difference occurred in elective joint arthroplasty, after which rural patients were 41% less likely to receive PAC of any kind.

This finding complements those of prior reports.²³ Others have found reduced use of PAC for Medicare patients undergoing elective joint arthroplasty in critical access hospitals—which are a smaller subset of rural hospitals included in this analysis.¹⁹ The supply of skilled nursing beds per capita, however, did not strongly influence whether SNF care was used for these patients.^{7,18} The size of the rural skilled therapist workforce and staffing of SNFs may play a role; others have found that patients undergoing joint arthroplasty are less likely to receive PAC in counties with low availability of rehabilitation therapists.^{18,24} It is unlikely the difference in urban and rural use is related to length of stay. We found the length of stay was very similar for elective joint arthroplasty (mean 3 days) in both groups, and the Medicare short-stay transfer policy penalizes hospitals—particularly rural hospitals using swing beds—from converting patients from inpatient stays to PAC stays too quickly.^{8,10}

Our work also extends these reports by systematically evaluating all urban and rural patients and hospitals sampled in a nationally representative dataset of all payers consisting of more than 1.5 million discharges. In doing so, it provides new insights into geographic

Table 2. Discharge Diagnoses and Hospital Length of Stay in Patients Discharged to PAC^a

Primary Discharge Diagnosis	Rural	Length of Stay (mean)	Urban	Length of Stay (mean)
	% (95% CI)	Days (95% CI)	% (95% CI)	Days (95% CI)
Pneumonia	7.5 (7.2-7.8)	5.7 (5.6-5.8)	3.5 (3.4-3.5)	6.9 (6.8-6.9)
Elective joint arthroplasty	6.4 (6.0-6.9)	3.3 (3.2-3.4)	7.9 (7.6-8.3)	3.2 (3.2-3.2)
Sepsis	6.1 (5.8-6.4)	7.3 (7.1-7.4)	6.4 (6.3-6.5)	9.8 (9.6-9.9)
Congestive heart failure	5.5 (5.3-5.7)	5.1 (5.0-5.3)	4.3 (4.3-4.4)	6.5 (6.5-6.6)
Urinary tract infection	4.2 (4.1-4.4)	4.5 (4.4-4.6)	2.9 (2.8-2.9)	5.1 (5.0-5.1)
COPD and bronchiectasis	4.2 (4.0-4.4)	5.9 (4.7-5.0)	2.2 (2.2-2.3)	5.7 (5.7-5.8)
Hip fracture	3.7 (3.6-3.9)	5.4 (5.3-5.5)	3.0 (2.9-3.0)	5.7 (5.7-5.8)
Acute cerebrovascular accident	3.1 (2.9-3.2)	4.7 (4.6-4.9)	3.6 (3.5-3.7)	6.7 (6.6-6.8)
Acute renal failure	2.4 (2.3-2.5)	5.4 (5.3-5.6)	2.5 (2.5-2.6)	6.6 (6.5-6.7)
Skin and subcutaneous tissue infection	2.4 (2.3-2.5)	5.1 (5.0-5.3)	2.0 (1.9-2.0)	5.8 (5.7-5.9)

CCS indicates Agency for Healthcare Research and Quality Clinical Classification Software categories; CI, confidence interval; COPD, chronic obstructive pulmonary disease; PAC, postacute care.

^aDiagnoses were grouped by single-level CCS category codes as follows: pneumonia (CCS category 122), elective joint arthroplasty (203), sepsis (2), congestive heart failure (108), urinary tract infection (159), COPD and bronchiectasis (127), hip fracture (226), acute cerebrovascular disease (109), acute renal failure (157), and skin and subcutaneous tissue infection (197).

variability in the use of PAC, and suggests further evaluation of the use of PAC in elective joint replacements, hip fracture, sepsis, and after acute cerebrovascular accident may be most fruitful for identifying the reasons for these differences.

Implications

These differences are important to understand from a cost perspective. For example, there are nearly 1 million hospitalizations for elec-

tive joint arthroplasty annually in the United States.²⁵ The mean cost of the hospital stay and 30-day postacute episode for these procedures is \$18,225, for a total of \$15.7 billion annually. The increased use of SNF care instead of HHC in rural areas may be leading to a significant increase in costs, given that the average cost of an SNF stay in the United States is \$11,357 compared with the average cost of an HHC episode of \$2720.²⁶ Given this difference, evaluating PAC outcomes in these populations is a critical next step. It is especially important now, as Medicare's expansion of Bundled Payment for Care Improvement, which encompasses the acute hospitalization and 90 days of postdischarge care (including PAC), expanded to 67 metropolitan areas in April 2016 using elective lower extremity joint replacement as the first targeted condition.²⁷

This type of focused investigation may also lend insight into whether the use of PAC after elective joint arthroplasty in these patients constitutes a disparity that affects important patient outcomes, as well as costs.¹⁸ Systematic evaluation of outcomes in these patients has the potential to strongly inform development of guidelines for appropriate use of PAC.^{28,29} For example, preliminary evidence suggests patient outcomes after stroke or hip replacement—2 of the conditions where PAC use was most different between rural and urban areas in our analysis—are significantly affected by what type of PAC they receive.²⁸⁻³⁰ Outcomes may be poorer in patients treated at critical access hospitals who use less HHC and more SNF care,^{19,31} but the quality of PAC may be an important variable to consider in such analyses.^{9,32-34}

There is little prior literature suggesting an underlying etiology for this marked difference in PAC use between patient discharges from urban and rural hospitals. Although there are several possible etiologies for this difference, including differences in premorbid physical function—an important variable we were unable to evaluate in this analysis—we speculated this difference may be due to decreased access to or availability of HHC in rural areas. In other words, there may be a significant proportion of patients who would qualify for and benefit from HHC, but no availability of agencies to care for this population. It may also reflect the significant lack of consensus on the use of PAC, particularly in borderline cases where patients might be expected to regain function with enough time and therapy either inside or outside the hospital.^{35,36}

Limitations

These findings should be interpreted in the context of the data from which they were derived. The study also had several notable strengths: systematic evaluation of a nationally representative sample of all payers and hospitals in the United States, including more than 4.6 million discharges, ascertainment of important patient and hospital characteristics that plausibly affect PAC use, and clear identification of both patient residence location and hospital location to ascertain true urban and rural differences. We were unable to ascertain some factors that may influence PAC use, such as preprocedure physical function or involvement of a caregiver in postdischarge care. To our knowledge, neither has been systematically assessed

Table 3. Multivariable Model Evaluating Influences on Use of PAC^a

Variable	OR (95% CI)
Rural hospital (ref = urban)	0.95 (0.91-0.99)
Age ^b	1.57 (1.56-1.58)
Female sex	1.22 (1.21-1.23)
Race (ref = white)	
Black	0.99 (0.97-1.02)
Hispanic	0.80 (0.77-0.83)
Asian/Pacific Islander	0.80 (0.75-0.85)
Native American	0.84 (0.76-0.92)
Unknown	0.95 (0.89-1.02)
Income (ref = <39,000)	
39,000-47,999	0.98 (0.96-1.00)
48,000-62,999	1.00 (0.98-1.02)
≥63,000	0.99 (0.96-1.02)
Elective admission	1.43 (1.39-1.48)
Payer (ref = Medicare)	
Medicaid	0.79 (0.78-0.81)
Private	0.71 (0.70-0.73)
Self-pay	0.35 (0.33-0.37)
No charge	0.32 (0.28-0.37)
Other	0.69 (0.67-0.72)
Length of stay, days ^c	2.72 (2.70-2.75)
Number of chronic diseases	1.07 (1.07-1.07)
Hospital ownership (ref = government)	
Nonprofit	1.06 (1.00-1.13)
For-profit	1.10 (1.03-1.19)
Geographic location (ref = Pacific)	
New England	1.91 (1.73-2.12)
Middle Atlantic	1.31 (1.22-1.40)
East North Central	1.18 (1.11-1.26)
West North Central	1.10 (1.01-1.20)
South Atlantic	1.10 (1.04-1.17)
East South Central	1.01 (0.92-1.10)
West South Central	1.01 (0.94-1.07)
Mountain	1.09 (1.00-1.19)

CI indicates confidence interval; OR, odds ratio; PAC, postacute care; ref, referent.

^aBolding indicates the variable is significantly associated with use of PAC.

^bAge is per 10-year increment.

^cLength of stay is log-transformed.

Table 4. Rural Versus Urban Discharges to PAC by Diagnosis in Multivariable Analysis^{a,b}

Diagnosis	SNF OR (95% CI)	HHC OR (95% CI)	SNF + HHC OR (95% CI)
All	1.04 (0.99-1.08)	0.85 (0.80-0.90)	0.95 (0.91-0.99)
Pneumonia	1.20 (1.13-1.27)	0.83 (0.77-0.90)	1.04 (0.98-1.10)
Elective joint arthroplasty	0.57 (0.48-0.69)	0.59 (0.47-0.74)	0.59 (0.49-0.71)
Sepsis	0.98 (0.91-1.06)	0.81 (0.75-0.88)	0.92 (0.86-0.98)
Congestive heart failure	1.23 (1.15-1.33)	0.92 (0.85-1.00)	1.06 (0.99-1.14)
Urinary tract infection	1.04 (0.97-1.11)	0.83 (0.76-0.91)	0.97 (0.91-1.04)
COPD and bronchiectasis	1.13 (1.04-1.22)	0.85 (0.78-0.93)	0.96 (0.89-1.03)
Hip fracture	0.81 (0.69-0.95)	0.86 (0.72-1.04)	0.82 (0.70-0.96)
Acute cerebrovascular accident	1.14 (1.05-1.24)	1.02 (0.93-1.12)	1.11 (1.03-1.19)
Acute kidney injury	1.14 (1.05-1.24)	0.95 (0.87-1.04)	1.06 (0.98-1.15)
Skin and soft tissue infection	1.21 (1.11-1.33)	0.78 (0.72-0.85)	0.93 (0.87-1.00)

CI indicates confidence interval; COPD, chronic obstructive pulmonary disease; HHC, home healthcare; OR, odds ratio; PAC, postacute care; SNF, skilled nursing facility.

^aAll comparisons are with urban patient/urban hospital as reference population.

^bBolding indicates significant associations.

or compared between urban and rural patients before elective surgical procedures—a potentially important gap in the literature for informing policy in rural areas. Discharge diagnoses are potentially subject to bias and coding error. We were unable to evaluate the appropriateness of discharges to PAC as this dataset does not contain postdischarge outcomes. We were also unable to formally undergo a market-level analysis, as geographic area is coded only at the regional and urban/rural levels in this dataset.

CONCLUSIONS

In the setting of increasing PAC use nationally, informing optimal practices for this population in urban and rural areas across the United States is essential for delivering the highest-value care in this growing population.

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