NC RHRP

Findings Brief
NC Rural Health Research Program

October 2022

Factors Predicting Swing Bed Versus Skilled Nursing Facility Use

Tyler Malone, MS; Mark Holmes, PhD

BACKGROUND AND PURPOSE

As defined by the Centers for Medicare & Medicaid Services (CMS), a skilled nursing facility (SNF) primarily provides "skilled nursing care and related services to patients who require medical, nursing, or rehabilitative services…"[1] In comparison, swing beds are beds at qualifying small, rural hospitals and can be used for either acute or post-acute SNF -level care.[2] This flexibility allows small hospitals to maximize use of hospital beds in a manner that also benefits patients transitioning between levels of care.[3] For individuals requiring post-acute care, the use of a SNF versus swing bed often has important financial implications. At Prospective Payment System (PPS) hospitals, swing bed SNF-level care is reimbursed under the SNF PPS. At Critical Access Hospitals (CAHs) with swing beds, SNF-level services are not reimbursed based on the SNF PPS and are instead reimbursed based on 101% of reasonable cost of care.[2] There has been recent debate among policymakers and researchers whether CAH skilled swing days should be reimbursed under the SNF PPS as well.[4-7] An important consideration within this debate is the possibility that swing bed versus SNF use could also be a function of clinical decision-making.[8] In particular, swing beds can potentially offer clinical advantages for post-acute care, given that swing beds allow patients discharged from acute care to remain in the same location. Differences in key patient characteristics,[9] such as age, location of residence, insurance status, length of acute care stay, and number of comorbidities, could also potentially affect these clinical decisions.

The objective of this study was to examine differences between patients discharged to swing beds versus SNFs, stratifying by admitting hospital type (i.e., rural CAH versus rural PPS hospital). Identification of key differences, or the lack thereof, between patients discharged to swing beds versus SNFs can help inform further discourse on this financially and clinically important topic.

KEY FINDINGS

- Using data from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID), we found that 4.0% of discharges from rural Critical Access Hospitals (CAHs) were discharged to swing beds, and 9.1% of rural CAH discharges were discharged to skilled nursing facilities (SNFs). In contrast, 0.2% of discharges from rural Prospective Payment System (PPS) hospitals were discharged to swing beds, and 10.7% of rural PPS hospital discharges were discharged to SNFs.
- Compared to those discharged to SNFs and adjusting for discharging hospital type (rural CAH versus rural PPS hospital), individuals discharged to swing beds were generally younger, more likely to be White, more likely to live in a rural ZIP code, more likely to be primarily insured via Medicare, and less likely to be primarily insured via private insurance. Individuals discharged to swing beds also had a lower average number of comorbidities.
- Compared to discharges to SNFs and adjusting for discharging hospital type, discharges to swing beds were more likely to be classified as surgery-related visits during acute care.

METHODS

To complete our study objective, we used 2019 data from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID).[10] The SID provide all-payer data on hospital inpatient discharges and include information on a multitude of patient characteristics (e.g., discharge disposition, age, sex, race/ethnicity, expected primary payer, length of stay, diagnoses, procedures performed). Not all states provide data on hospital identifiers and patient ZIP

code of residence, which are needed to identify hospital payment classification and patient rurality, respectively. Thus, we purchased SID data for six states (Arizona, California, Iowa, North Carolina, Wisconsin, and Vermont), each of which provides information on hospital identifiers used by the American Hospital Association (AHA) and patient ZIP code. By selecting this group of states, we include at least one state from each of the four U.S. Census regions.

Using a data crosswalk linking AHA hospital identifiers to the corresponding CMS Certification Number (CCN),[11] we merged SID data with hospital payment classification data from the Healthcare Cost Report Information System (HCRIS)[12] and Inpatient Provider Specific File (IPSF).[13] Next, we restricted our data to discharges from rural hospitals with available information on payment classification. We defined hospitals as "rural" if the hospital was located in a rural ZIP code identified by the Federal Office of Rural Health Policy for the 2022 fiscal year.[14] After identifying discharges from rural hospitals, we stratified discharges based on discharging hospital payment classification (CAH vs. PPS) and discharge disposition.[15] For patients discharged to a swing bed or SNF, we compared aggregated patient demographics, diagnoses, and procedures across strata defined by discharging hospital payment classification and swing bed versus SNF discharge status. Formal tests of comparison were completed using the two-sample test for equality of proportions (categorical variables) or two-sample test for equality of means (continuous variables). We initially considered a statistical significance threshold of p = .05. However, to correct for multiple testing, we applied a Bonferroni adjustment that accounted for the 121 statistical tests completed during our analysis.[16, 17] Thus, we considered results with p-values less than .05/121=0.0004 to be statistically significant.

RESULTS

Table 1 shows the discharge disposition of individuals from our sample of rural CAHs and PPS hospitals. In total, we analyzed 565,205 discharges from rural CAHs (n = 134,695) and rural PPS hospitals (n = 430,510).[18] We found that 4.0% of discharges from rural CAHs and 0.2% of discharges from rural PPS hospitals were discharged to swing beds; the difference in discharge rate to swing beds was statistically significant. Furthermore, 9.1% of rural CAH discharges and 10.7% of rural PPS hospital discharges were discharged to SNFs (either rural or urban SNFs); this difference in discharge rate was also statistically significant. Appendix Table A1 at the end of the brief provides the discharge disposition of individuals from a comparison sample of urban CAHs and PPS hospitals.

Table 1. Discharge Disposition of Individuals from Rural CAHs and PPS Hospitals

Discharge Disposition	Rural CAH and PPS Discharges (n = 565,205) %	Rural CAH Discharges (n = 134,695) %	Rural PPS Discharges (n = 430,510) %	Percentage Point Difference Between Rural CAH Rate and Rural PPS Rate[a]
To Swing Bed	1.1	4.0	0.2	3.8*
To Skilled Nursing Facility	10.3	9.1	10.7	–1.6*
To Home or Self Care	66.1	66.3	66.1	0.2
To Another General Acute Care Hospital	4.6	6.2	4.0	2.2*
To Home with Home Health	9.9	6.6	10.9	–4.3*
To Hospice[b]	1.8	1.5	1.9	–0.4*
Other	6.2	6.3	6.2	0.1

Abbreviations: CAH = Critical Access Hospital; PPS = Prospective Payment System.

Notes: Statistics are calculated from observations with available data on discharge disposition. Of 565,267 observations from rural CAH and PPS hospitals, 565,205 had available data for discharge disposition.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for Arizona, California, Iowa, North Carolina, Vermont, and Wisconsin, 2019.

[a] Rural CAH discharge rate minus rural PPS hospital discharge rate.

[b] Includes both home-based and facility-based hospice.

*Difference in discharge disposition between rural CAH discharges and rural PPS discharges is statistically significant after correction for multiple testing (p < .0004), as assessed by the two-sample test for equality of proportions.

For the remainder of the analyses, we only consider those discharged to swing beds or SNFs. Table 2 provides characteristics of patients stratified by their disposition (swing bed or SNF) and discharging hospital payment classification (rural CAH versus rural PPS hospital). Compared to individuals discharged to SNFs and adjusting for discharging hospital type, individuals discharged to swing beds were significantly younger, were significantly more likely to be White, and had a significantly lower average number of comorbidities. Among individuals discharged from rural CAHs, those discharged to swing beds were also significantly more likely to be primarily insured by Medicare, were significantly less likely to be primarily insured by private insurance, and had a significantly shorter average length of stay than individuals discharged to SNFs. Among individuals discharged from rural PPS hospitals, those discharged to swing beds were also significantly more likely than individuals discharged to SNFs to live in a rural ZIP code identified by the Federal Office of Rural Health Policy for the 2022 fiscal year.[14]

Table 2. Characteristics of Patients Discharged to Swing Beds or SNFs

	Rural CAH and PPS Combined	Rural CAH Discharges			Rural PPS Discharges		
Patient Characteristics	**To Swing Bed or SNF (n = 64,409)**	**To Swing Bed (n = 5,433)**	**To SNF (n = 12,240)**	**Difference: Swing – SNF**	**To Swing Bed (n = 834)**	**To SNF (n = 45,902)**	**Difference: Swing – SNF**
Patient Age (Mean Years)	78.1	79.5	80.4	–0.9*	74.8	77.4	–2.6*
Patient Age Category (%)							
64 Years and Younger	12.6	9.9	8.9	1.0	18.6	13.8	4.8*
65 – 74 Years	21.8	19.6	17.8	1.8	23.7	23.0	0.7
75 – 84 Years	32.6	33.1	32.6	0.5	33.3	32.6	0.7
85 Years and Older	33.0	37.3	40.7	–3.4*	24.3	30.6	–6.3*
Female (%)	59.5	58.9	60.5	–1.6	56.2	59.4	–3.2
Race / Ethnicity[a] (%)							
White	87.8	97.6	94.5	3.1*	96.0	84.7	11.3*
Black	8.0	0.4	1.6	–1.2*	Suppressed[b]	10.7	Suppressed[b]
Hispanic	2.0	1.3	1.6	–0.3	Suppressed[b]	2.2	Suppressed[b]
Asian or Pacific Islander	0.3	Suppressed[b]	Suppressed[b]	Suppressed[b]	Suppressed[b]	0.3	Suppressed[b]
Native American	1.5	0.3	1.8	–1.5*	1.9	1.6	0.3
Race/Ethnicity Not Listed Above	0.5	Suppressed[b]	Suppressed[b]	Suppressed[b]	Suppressed[b]	0.5	Suppressed[b]
Rural Residence (%)	91.6	96.7	96.2	0.5	97.1	89.7	7.4*
Primary Expected Payer (%)							
Medicare	84.7	92.5	89.7	2.8*	85.8	82.4	3.4
Medicaid	3.7	2.2	2.7	–0.5	4.8	4.1	0.7
Private Insurance	10.3	4.5	5.9	–1.4*	8.1	12.1	–4.0
Other	1.4	0.8	1.7	–0.9*	1.3	1.3	0.0
Length of Stay (Mean Days)	6.1	4.6	5.7	–1.1*	6.5	6.4	0.1
Number of Comorbidities[c] (Mean)	4.1	3.2	3.7	–0.5*	3.7	4.3	–0.6*

Abbreviations: SNF = Skilled Nursing Facility; CAH = Critical Access Hospital; PPS = Prospective Payment System.

Notes: Statistics are calculated from observations with complete data on the given characteristic. Of the 64,409 observations in the sample, 0.7% of observations had missing data for race/ethnicity, 1.8% of observations had missing data for patient rurality, and 0.2% of observations had missing data for primary expected payer or length of stay. No observations had missing data for age, sex, or number of comorbidities.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for Arizona, California, Iowa, North Carolina, Vermont, and Wisconsin, 2019.

[a] Categories defined by HCUP.

[b] Cell totals less than or equal to 10 are suppressed to protect patient privacy and to follow guidelines established by the State Inpatient Databases (SID) Data Use Agreement.

[c] Calculated using the HCUP Elixhauser Comorbidity Software Refined for ICD-10-CM, v2022.1. HCUP. AHRQ, Rockville, MD. https://www.hcup-us.ahrq.gov/toolssoftware/comorbidityicd10/comorbidity_icd10.jsp. Accessed April 5, 2022.

*Difference between values in "To Swing Bed" and "To SNF" columns, holding discharging hospital type constant, is statistically significant after correction for multiple testing ($p < .0004$), as assessed by the two-sample test for equality of proportions (categorical variables) or two-sample test for equality of means (continuous variables).

Table 3 describes the most common service lines for patients discharged from rural CAHs and PPS hospitals to swing beds or SNFs. Among rural CAHs, discharges to swing beds were significantly more likely to be classified as surgery-related visits during acute care (compared to discharges to SNFs). Among rural PPS hospitals, discharges to swing beds were significantly less likely to be classified as general medical visits and significantly more likely to be classified as surgery-related visits.

Table 3. Hospitalization Type (Service Line) for Discharges to Swing Beds or SNFs

Discharged from Rural CAHs				
Discharged to Swing Beds (n = 5,433)	**%**	**Discharged to SNFs (n = 12,240)**	**%**	**Percentage Point Difference: Swing % – SNF %**
1. Medical	78.0	1. Medical	77.7	0.3
2. Injury	11.8	2. Injury	13.5	–1.7
3. Surgical	9.1	3. Surgical	7.2	1.9*
4. Mental Health/Substance Use OR Maternal and Neonatal[a]	1.2	4. Mental Health/Substance Use OR Maternal and Neonatal[a]	1.6	–0.4
Discharged from Rural PPS Hospitals				
Discharged to Swing Beds (n = 834)	**%**	**Discharged to SNFs (n = 45,902)**	**%**	**Percentage Point Difference: Swing % – SNF %**
1. Medical	52.6	1. Medical	67.1	–14.5*
2. Surgical	29.0	2. Surgical	16.4	12.6*
3. Injury	17.0	3. Injury	15.1	1.9
4. Mental Health/Substance Use OR Maternal and Neonatal[a]	1.3	4. Mental Health/Substance Use OR Maternal and Neonatal[a]	1.4	–0.1

Abbreviations: SNF = Skilled Nursing Facility; CAH = Critical Access Hospital; PPS = Prospective Payment System.

Notes: Hospitalization types are based on criteria defined by the Healthcare Cost and Utilization Project (https://www.hcup-us.ahrq.gov/db/vars/siddistnote.jsp?var=i10_serviceline).

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for Arizona, California, Iowa, North Carolina, Vermont, and Wisconsin, 2019.

[a] Cell totals less than or equal to 10 cannot be reported, as outlined by the State Inpatient Databases (SID) Data Use Agreement (DUA). Thus, we combined the "Mental Health/Substance Use" and "Maternal and Neonatal" categories to protect patient privacy and to follow guidelines established by the DUA.

*Difference between values in "Discharged to Swing Beds" and "Discharged to SNFs" columns, holding discharging hospital type constant, is statistically significant after correction for multiple testing ($p < .0004$), as assessed by the two-sample test for equality of proportions.

Table 4 provides the most common major diagnostic categories (MDCs) for patients discharged to swing beds or SNFs. A comparison of most common MDCs shows that, among rural CAHs, discharges to swing beds were significantly more likely to receive acute care for diagnoses related to the respiratory system, skin, subcutaneous tissue, or breast and were significantly less likely to be treated for diagnoses related to the musculoskeletal system, connective tissue, or nervous system. In addition, discharges from rural PPS hospitals to swing beds were significantly more likely than discharges from rural PPS hospitals to SNFs to receive acute care for diagnoses related to the musculoskeletal system and connective tissue and were significantly less likely to be treated for diagnoses related to the kidney and urinary tract.

Table 4. Ten Most Common *Major Diagnostic Categories* for Discharges to Swing Beds or SNFs

Discharged from Rural CAHs			
Discharged to Swing Beds (n = 5,433)	**%**	**Discharged to SNFs (n = 12,240)**	**%**
1. Diseases & Disorders of the Respiratory System	23.4*	1. Diseases & Disorders of the Musculoskeletal System & Connective Tissue	22.0*
2. Diseases & Disorders of the Musculoskeletal System & Connective Tissue	18.8*	2. Diseases & Disorders of the Respiratory System	17.1*
3. Diseases & Disorders of the Circulatory System	10.8	3. Diseases & Disorders of the Circulatory System	10.0
4. Diseases & Disorders of the Kidney & Urinary Tract	9.5	4. Diseases & Disorders of the Kidney & Urinary Tract	9.9
5. Infectious & Parasitic Diseases, Systemic or Unspecified Sites	8.5	5. Infectious & Parasitic Diseases, Systemic or Unspecified Sites	8.8
6. Diseases & Disorders of the Skin, Subcutaneous Tissue & Breast	6.8*	6. Diseases & Disorders of the Nervous System	8.8*
7. Diseases & Disorders of the Nervous System	5.4*	7. Diseases & Disorders of the Digestive System	5.0
8. Diseases & Disorders of the Digestive System	5.0	8. Factors Influencing Health Status & Other Contacts with Health Services	4.9*
9. Endocrine, Nutritional & Metabolic Diseases & Disorders	4.7	9. Endocrine, Nutritional & Metabolic Diseases & Disorders	4.3
10. Factors Influencing Health Status & Other Contacts with Health Services	2.7*	10. Diseases & Disorders of the Skin, Subcutaneous Tissue & Breast	3.7*
All Others Combined (12 Categories)[a]	4.4	All Others Combined (15 Categories)[a]	5.4

Discharged from Rural PPS Hospitals			
Discharged to Swing Beds (n = 834)	**%**	**Discharged to SNFs (n = 45,902)**	**%**
1. Diseases & Disorders of the Musculoskeletal System & Connective Tissue	31.8*	1. Diseases & Disorders of the Musculoskeletal System & Connective Tissue	22.8*
2. Diseases & Disorders of the Circulatory System	13.1	2. Infectious & Parasitic Diseases, Systemic or Unspecified Sites	15.4
3. Infectious & Parasitic Diseases, Systemic or Unspecified Sites	12.8	3. Diseases & Disorders of the Circulatory System	13.0
4. Diseases & Disorders of the Respiratory System	10.2	4. Diseases & Disorders of the Respiratory System	11.6
5. Diseases & Disorders of the Nervous System	6.1	5. Diseases & Disorders of the Kidney & Urinary Tract	9.6*
6. Endocrine, Nutritional & Metabolic Diseases & Disorders	5.6	6. Diseases & Disorders of the Nervous System	8.1
7. Diseases & Disorders of the Digestive System	5.3	7. Diseases & Disorders of the Digestive System	6.1
8. Diseases & Disorders of the Kidney & Urinary Tract	4.6*	8. Endocrine, Nutritional & Metabolic Diseases & Disorders	4.4
9. Diseases & Disorders of the Skin, Subcutaneous Tissue & Breast	2.9	9. Diseases & Disorders of the Skin, Subcutaneous Tissue & Breast	2.4
10. Injuries, Poisonings & Toxic Effects of Drugs	1.6	10. Diseases & Disorders of the Hepatobiliary System & Pancreas	1.4
All Others Combined (10 Categories)	6.1	All Others Combined (16 Categories)[a]	5.2

Abbreviations: SNF = Skilled Nursing Facility; CAH = Critical Access Hospital; PPS = Prospective Payment System.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for Arizona, California, Iowa, North Carolina, Vermont, and Wisconsin, 2019.

[a] Includes category of "MDC 0: Principal Diagnosis Cannot be Assigned to MDC."

*Difference between values in "Discharged to Swing Beds" and "Discharged to SNFs" columns, holding discharging hospital type and major diagnostic category constant, is statistically significant after correction for multiple testing ($p < .0004$), as assessed by the two-sample test for equality of proportions. The test for equality of proportions was not used to compare differences in the proportion of observations in the "All Others Combined" group.

Table 5 shows the most common principal diagnoses for discharges to swing beds or SNFs. Among rural CAHs, discharges to swing beds were significantly more likely than discharges to SNFs to receive acute care for pneumonia, skin and subcutaneous tissue infections, chronic obstructive pulmonary disease, and bronchiectasis. In contrast, discharges to swing beds were significantly less likely to receive acute care for hip fractures. Among rural PPS hospitals, discharges to swing beds were significantly more likely to receive acute care for osteoarthritis and diabetes mellitus.

Table 5. Ten Most Common *Principal Diagnoses* for Discharges to Swing Beds or SNFs

Discharged from Rural CAHs			
Discharged to Swing Beds (n = 5,433)	**%**	**Discharged to SNFs (n = 12,240)**	**%**
1. Pneumonia (except that caused by tuberculosis)	12.7*	1. Septicemia	8.0
2. Septicemia	7.5	2. Pneumonia (except that caused by tuberculosis)	8.0*
3. Urinary tract infections	6.6	3. Heart failure	6.0
4. Heart failure	6.6	4. Fracture of the neck of the femur (hip), initial encounter	5.9*
5. Skin and subcutaneous tissue infections	5.3*	5. Urinary tract infections	5.8
6. Chronic obstructive pulmonary disease and bronchiectasis	4.6*	6. Osteoarthritis	3.5
7. Osteoarthritis	4.1	7. Cerebral infarction	3.2
8. Fracture of the neck of the femur (hip), initial encounter	4.0*	8. Skin and subcutaneous tissue infections	2.7*
9. Cerebral infarction	2.8	9. Acute and unspecified renal failure	2.6
10. Fluid and electrolyte disorders	2.3	10. Chronic obstructive pulmonary disease and bronchiectasis	2.5*
All Others Combined (217 Categories)	43.5	All Others Combined (258 Categories)	51.8

Discharged from Rural PPS Hospitals			
Discharged to Swing Beds (n = 834)	**%**	**Discharged to SNFs (n = 45,902)**	**%**
1. Septicemia	11.9	1. Septicemia	14.6
2. Fracture of the neck of the femur (hip), initial encounter	9.8	2. Fracture of the neck of the femur (hip), initial encounter	8.3
3. Osteoarthritis	8.5*	3. Heart failure	6.1
4. Heart failure	5.0	4. Urinary tract infections	4.0
5. Diabetes mellitus with complication	4.4*	5. Osteoarthritis	3.8*
6. Pneumonia (except that caused by tuberculosis)	3.2	6. Pneumonia (except that caused by tuberculosis)	3.7
7. Fracture of the lower limb (except hip), initial encounter	2.8	7. Acute and unspecified renal failure	3.7
8. Cerebral infarction	2.4	8. Cerebral infarction	3.6
9. Respiratory failure; insufficiency; arrest	2.2	9. Fracture of the lower limb (except hip), initial encounter	2.3
10. Skin and subcutaneous tissue infections	2.2	10. Diabetes mellitus with complication	2.3*
All Others Combined (129 Categories)	47.6	All Others Combined (318 Categories)	47.5

Abbreviations: SNF = Skilled Nursing Facility; CAH = Critical Access Hospital; PPS = Prospective Payment System.

Notes: Clinical categories in Table 5 were determined using the following software tool – HCUP Clinical Classifications Software Refined (CCSR) for ICD-10-CM diagnoses, v2022.1. HCUP. AHRQ, Rockville, MD. https://www.hcup-us.ahrq.gov/toolssoftware/ccsr/dxccsr.jsp. Accessed April 5, 2022.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for Arizona, California, Iowa, North Carolina, Vermont, and Wisconsin, 2019.

*Difference between values in "Discharged to Swing Beds" and "Discharged to SNFs" columns, holding discharging hospital type and principal diagnosis constant, is statistically significant after correction for multiple testing ($p < .0004$), as assessed by the two-sample test for equality of proportions. The test for equality of proportions was not used to compare differences in the proportion of observations in the "All Others Combined" group.

Lastly, Table 6 describes the most common acute care primary procedure classifications for discharges to swing beds or SNFs. Among individuals discharged from rural CAHs, those discharged to swing beds were significantly more likely to undergo procedures related to catheter placement or physical, occupational, and respiratory therapy and were significantly less likely to undergo femur fixation. Among individuals discharged from rural PPS hospitals, those discharged to swing beds were significantly more likely to undergo knee arthroplasty or spine fusion.

Table 6. Ten Most Common *Primary Procedure Classifications* for Discharges to Swing Beds or SNFs

Discharged from Rural CAHs			
Discharged to Swing Beds (n = 1,497)[a]	**%**	**Discharged to SNFs (n = 3,270)[a]**	**%**
1. Hip arthroplasty	11.0	1. Femur fixation	13.9*
2. Knee arthroplasty	9.7	2. Hip arthroplasty	13.3
3. Femur fixation	9.2*	3. Knee arthroplasty	9.2
4. Venous and arterial catheter placement	7.9*	4. Transfusion of blood and blood products	7.4
5. Physical, occupational, and respiratory therapy treatment	6.9*	5. Non-invasive ventilation	5.8
6. Transfusion of blood and blood products	5.9	6. Venous and arterial catheter placement	4.8*
7. Non-invasive ventilation	3.7	7. Physical, occupational, and respiratory therapy treatment	2.8*
8. Administration of antibiotics	3.1	8. Fixation of leg and foot bones	2.5
9. Subcutaneous tissue and fascia excision	2.7	9. Ultrasonography	2.2
10. Administration of therapeutic substances, NEC	2.1	10. Esophagogastroduodenoscopy with biopsy	1.9
All Others Combined (93 Categories)	37.9	All Others Combined (127 Categories)	36.2
Discharged from Rural PPS Hospitals			
Discharged to Swing Beds (n = 559)[a]	**%**	**Discharged to SNFs (n = 24,723)[a]**	**%**
1. Hip arthroplasty	11.8	1. Femur fixation	10.9
2. Venous and arterial catheter placement	9.5	2. Hip arthroplasty	9.4
3. Femur fixation	9.3	3. Venous and arterial catheter placement	7.2
4. Knee arthroplasty	8.9*	4. Non-invasive ventilation	5.3
5. Transfusion of blood and blood products	3.8	5. Transfusion of blood and blood products	5.2
6. Fixation of leg and foot bones	3.2	6. Knee arthroplasty	5.0*
7. Ultrasonography	2.7	7. Hemodialysis	2.6
8. Spine fusion	2.7*	8. Fixation of leg and foot bones	2.0
9. Toe and mid foot amputation	2.3	9. Ultrasonography	2.0
10. Non-invasive ventilation	2.1	10. Mechanical ventilation	1.8
All Others Combined (102 Categories)	43.6	All Others Combined (234 Categories)	48.6

Abbreviations: SNF = Skilled Nursing Facility; CAH = Critical Access Hospital; PPS = Prospective Payment System; NEC = Necrotizing Enterocolitis.

Notes: Clinical categories in Table 6 were determined using the following software tool – HCUP Clinical Classifications Software Refined (CCSR) for ICD-10-PCS procedures, v2022.1. HCUP. AHRQ, Rockville, MD. https://www.hcup-us.ahrq.gov/toolssoftware/ccsr/prccsr.jsp. Accessed April 5, 2022.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for Arizona, California, Iowa, North Carolina, Vermont, and Wisconsin, 2019.

[a] Includes individuals with a listed primary procedure.

*Difference between values in "Discharged to Swing Beds" and "Discharged to SNFs" columns, holding discharging hospital type and primary procedure classification constant, is statistically significant after correction for multiple testing ($p < .0004$), as assessed by the two-sample test for equality of proportions. The test for equality of proportions was not used to compare differences in the proportion of observations in the "All Others Combined" group.

DISCUSSION

The objective of our research was to examine differences between patients discharged to swing beds versus SNFs, stratifying by admitting hospital type. We found that discharges to swing beds exhibited several statistically significant differences from discharges to SNFs, both in terms of demographic characteristics (e.g., age, race/ethnicity, location of residence) and clinical characteristics (insurance status, length of acute care stay, number of comorbidities, service line, major diagnostic category, principal diagnosis, primary procedure classification). These results collectively suggest that swing bed versus SNF use for post-acute care is at least partially dependent on patient-level characteristics.

The analysis covered in this brief focused on descriptive methods and statistical tests designed to identify basic differences between groups of inpatient discharges. Thus, future research can build upon our findings through consideration of multivariable regression models. Regression models can readily control for possible confounders and provide a more detailed description of associations between discharge disposition and both patient-level and hospital-level predictors. Going forward, multivariable analysis will be needed to provide policymakers and rural stakeholders with greater insight on the mechanisms driving swing bed versus SNF use.

APPENDIX

Table A1. Discharge Disposition of Individuals from *Urban* CAHs and PPS Hospitals

Discharge Disposition	Urban CAH + PPS Discharges (n = 5,597,356) %	Urban CAH Discharges (n = 8,441) %	Urban PPS Discharges (n = 5,588,915) %
To Swing Bed	< 0.1	3.7	< 0.1
To Skilled Nursing Facility	9.4	8.2	9.4
To Home or Self Care	68.5	64.4	68.5
To Another General Acute Care Hospital	1.8	6.5	1.8
To Home with Home Health	11.7	9.0	11.7
To Hospice[a]	1.6	1.6	1.6
Other	6.9	6.6	6.9

Abbreviations: CAH = Critical Access Hospital; PPS = Prospective Payment System.

Notes: Statistics are calculated from observations with available data on discharge disposition. Of 5,598,139 observations from urban CAH and PPS hospitals, 5,597,356 had available data for discharge disposition.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID) for Arizona, California, Iowa, North Carolina, Vermont, and Wisconsin, 2019.

[a] Includes both home-based and facility-based hospice.

REFERENCES AND NOTES

1. Centers for Medicare & Medicaid Services. Glossary [Internet]. n.d. [cited 2022 May 17]. Available from: https://www.cms.gov/glossary?term=skilled+nursing+facility+%28SNF%29&items_per_page=10&viewmode=grid.
2. Centers for Medicare & Medicaid Services. Swing bed providers [Internet]. 2021 [cited 2022 May 17]. Available from: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/SNFPPS/SwingBed.
3. Temple KM. Understanding the rural swing bed: More than just a reimbursement policy [Internet]. 2021 [cited 2022 July 2]. Available from: https://www.ruralhealthinfo.org/rural-monitor/swing-beds/.
4. Office of Inspector General. Swing-bed services at nationwide Critical Access Hospitals [Internet]. n.d. [cited 2022 May 17]. Available from: https://oig.hhs.gov/reports-and-publications/workplan/summary/wp-summary-0000511.asp.
5. Office of Inspector General. Medicare could have saved billions at Critical Access Hospitals if swing-bed services were reimbursed using the Skilled Nursing Facility Prospective Payment System rates [Internet]. 2015 [cited 2022 May 17]. Available from: https://oig.hhs.gov/oas/reports/region5/51200046.pdf.
6. Reiter KL, Holmes GM. A critique of the Office of the Inspector General's report on swing beds in Critical Access Hospitals. Chapel Hill, NC: NC Rural Health Research Program; March 2015. Available from: https://www.shepscenter.unc.edu/wp-content/uploads/2015/03/CritiqueOfOIGreportMarch2015.pdf.
7. Broussard DM, Reiter KL. Estimated reduction in CAH profitability from loss of cost-based reimbursement for swing beds. Chapel Hill, NC: NC Rural Health Research Program; May 2020. Available from: https://www.ruralhealthresearch.org/publications/1281.
8. Freeman VA, Radford A. Why use swing beds? Conversations with hospital administrators and staff. Chapel Hill, NC: NC Rural Health Research Program; April 2012. Available from: https://www.ruralhealthresearch.org/publications/836.
9. Freeman VA, Randolph RK, Holmes M. Discharge to swing bed or Skilled Nursing Facility: Who goes where? Chapel Hill, NC: NC Rural Health Research Program; February 2014. Available from: https://www.ruralhealthresearch.org/publications/911.
10. State Inpatient Databases (SID) of Arizona, California, Iowa, North Carolina, Vermont, Wisconsin. Healthcare Cost and Utilization Project (HCUP). 2019. Agency for Healthcare Research and Quality, Rockville, MD. Available from: www.hcup-us.ahrq.gov/sidoverview.jsp.
11. AHA Annual Survey Database™ Fiscal Year 2019. Health Forum LLC, an American Hospital Association Company. 2019. Available from: https://www.ahadata.com/aha-annual-survey-database.
12. Healthcare Cost Report Information System (HCRIS) data file for hospitals for the 1st, 2nd, 3rd, and 4th Quarters of Year 2019. Centers for Medicare & Medicaid Services. 2020. Available from: https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Cost-Reports.
13. Historical Inpatient Provider Specific File. Centers for Medicare & Medicaid Services. 2021. Available from: https://www.cms.gov/medicare/prospective-payment-systems-general-information/historical-provider-specific-data-public-use-file-csv-format.
14. Federal Office of Rural Health Policy (FORHP) data files. Health Resources & Services Administration. 2022. Available from: https://www.hrsa.gov/rural-health/about-us/what-is-rural/data-files.
15. We used the 'DISPUB04' variable provided by the SID to identify discharges to swing beds or SNFs. Specifically, we identified discharges to swing beds as observations with DISPUB04 values equal to 61 or 89. We identified discharges to SNFs as observations with DISPUB04 values equal to 3 or 83.
16. Shaffer JP. Multiple Hypothesis Testing. *Annual Review of Psychology*. 1995;46(1):561-584.
17. Weisstein EW. Bonferroni correction [Internet]. 2022 [cited 2022 July 03]. Available from: https://mathworld.wolfram.com/BonferroniCorrection.html.
18. PPS hospitals are paid under the Inpatient PPS system and include those with special designations (e.g., Medicare Dependent Hospital, Sole Community Hospital, and Rural Referral Center) as well as PPS hospitals that have no other special designations.

Suggested Brief Citation

Malone T, Holmes M. *Factors Predicting Swing Bed Versus Skilled Nursing Facility Use.* NC Rural Health Research Program, UNC Sheps Center. October 2022.

This study was supported by the Federal Office of Rural Health Policy (FORHP), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under cooperative agreement # U1CRH03714. The information, conclusions and opinions expressed in this brief are those of the authors and no endorsement by FORHP, HRSA, HHS, or The University of North Carolina is intended or should be inferred.