# Medicare Payment Policy for Long-Term Acute Care Hospitals: An Assessment of Patient Complexity and Payment Accuracy

## Final Report

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## Executive Summary

**Purpose:** Long term acute care hospitals (LTACHs) are acute care hospitals designed to care for severely ill patients who require extended complex inpatient care in a hospital setting. The LTACH prospective payment system (PPS) was modeled after the hospital inpatient prospective payment system (IPPS) for short-term acute care hospitals (STACHs). However, LTACHs differ from IPPS hospitals in important ways, including average patient complexity and provision of specialized treatments. We assess the current LTACH PPS by comparing characteristics of Medicare fee-for-service patients receiving care at LTACHs versus other settings; report variation in payment-to-cost (PCR) ratios by patient complexity; and examine patient differences across LTACHs over time.

**Methods:** We used claims data from various years of the Standard Analytic Files, corresponding Medicare Beneficiary Summary Files, and the MedPAR file to complete the analyses. To estimate costs, we multiplied covered charges on each claim by a LTACH-specific cost-to-charge ratio obtained from hospital cost reports.

**Results:** Medicare beneficiaries transferred to LTACHs, on average, are younger than all fee-for-service Medicare beneficiaries discharged from IPPS hospitals. Patients transferred to an LTACH were also more likely to be non-White beneficiaries and Medicare-Medicaid eligible (dual eligible). Compared to other care settings, LTACH patients are more severely ill, with the higher severity of illness reflecting greater rates of multiple organ failure, greater rates of ventilator use, and higher number of comorbidities and complications (CCs) and major CCs (MCCs).

The top 20 Medicare Severity Long-term Care Diagnosis Related Groups (MS-LTC-DRGs) accounted for 78 percent of LTACH cases, 83 percent of total LTACH costs and payments, and 86 percent of total outlier payments for cases paid under the LTACH PPS. The concentration of cases, costs, and payments in the top 20 MS-LTC-DRGs has increased over time. IPPS hospitals exhibited less concentration of cases, payments, and outlier payments. In fiscal year 2022, the top 20 MS-DRGs at IPPS hospitals accounted for 36 percent of cases, 29 percent of payments, and 19 percent of outlier payments. Because LTACHs cases are concentrated in a small number of MS-LTC-DRGs, payment accuracy under the LTACH PPS is dependent on the ability of those DRGs to account for variation in patient costs.

We found that high acuity cases, which were identified based on the number of CCs and MCCs, tended to be underpaid under the LTACH PPS. Further, we found stability in the share of high acuity cases treated by LTACHs over time. That is, LTACHs that saw a high share of high acuity cases in any given year were likely to see a high share of high acuity cases in subsequent years. As a result, LTACHs treating a high share of the most complex cases are systematically underpaid relative to those treating lower complexity cases.

**Conclusions and Implications**: Given the unique aspects of LTACHs relative to IPPS hospitals and low Medicare margins, review and refinement of the LTACH PPS may be needed to ensure continued access to these specialty hospitals. Specifically, our results indicate payment accuracy could be improved by increasing the number of case-mix categories under the LTACH PPS. Such changes could help stave off further contraction of the LTACH industry, particularly among those treating the most critically ill and medically complex.

## 1. Introduction

Long term acute care hospitals (LTACHs) are acute care hospitals designed to care for severely ill patients who require extended complex inpatient care in a hospital setting. These specialty hospitals, of which there are around 350 in the U.S., must meet the same requirements as short-term acute care hospitals (STACHs) but have an average length of stay of over 25 days for certain Medicare patients. Less than 1 percent of all Medicare STACH discharges are transferred to LTACHs. To manage their high acuity patients, LTACHs offer specialized care designed to manage specific clinical conditions. These care programs can differ widely across hospitals, making LTACHs a heterogenous care setting.

In Fiscal Year (FY) 2003, the Centers for Medicare & Medicaid Services (CMS) began phasing in a prospective payment system (PPS) for LTACHs. Modeled, in part, after the hospital inpatient prospective payment system (IPPS) for STACHs, the LTACH PPS pays an LTACH a prospective fixed rate per discharge. This fixed rate is based on the Diagnosis-Related Group (DRG) assigned to a patient.

In 2007, CMS aimed to improve the DRG system with the introduction of Medicare-Severity DRGs (MS-DRGs), which expanded the number of DRGs by differentiating (for many DRGs) between cases with at least one comorbidity or complication (CC) or major CC (MCC) and those without a CC or MCC. For FY 2024, there are over 750 MS-DRGs in the LTACH PPS (these are referred to as MS-Long Term Care-DRGs or MS-LTC-DRGs).

Patients receiving care in LTACHs are, on average, more likely to be critically ill and medically complex as compared to patients receiving care in other settings. Policy makers and researchers viewed LTACHs as a more appropriate care setting for the highest acuity patients. In FY 2016, CMS began paying LTACHs based on a new dual payment system, designed to encourage LTACHs to focus on a set of complex patients (Text Box 1). The policy resulted in a case mix shift toward higher complexity patients.

**Text Box 1: LTACH Payment Reforms**

In fiscal year (FY) 2016, Medicare began paying LTACHs based on a new dual payment system established by the Pathway for SGR Reform Act of 2013. For patients that meet certain payment criteria ("standard rate cases"), payment rates are largely unchanged. For all other cases, Medicare pays a "site-neutral" rate set at the lower of the LTACH cost of care or an amount comparable to what an IPPS hospital would be paid for the same case. The purpose of the dual payment system was to encourage LTACHs to increase their focus on critically ill and medically complex patients. Congress established two ways in which a patient could meet criteria: (1) if he or she spent 3 or more days in the intensive care unit (ICU) during an immediately preceding IPPS hospital stay; or (2) if the patient received prolonged mechanical ventilation at the LTACH and had a IPPS hospital stay immediately preceding LTACH admission.

Congress initially established a two-year transition to the new policy, which was subsequently extended until FY 2020. During the transition period, LTACHs received a 50/50 blend of the site-neutral rate and the standard rate for site-neutral cases. The site-neutral policy was waived during the COVID-19 public health emergency but was fully reinstated for Medicare admissions on or after May 12, 2023.

In this study, we assess the current LTACH PPS by examining characteristics of Medicare fee-for-service patients receiving care at LTACHs. We compare LTACH patients to those receiving care in other settings, assess differences in

patient mix between LTACHs and IPPS hospitals, and report variation in payment-to-cost (PCR) ratios by patient complexity. We conclude with a discussion of policy implications. Study methods are provided in the Appendix.

## 2. Patient Demographics, Clinical Characteristics, and Resource Use

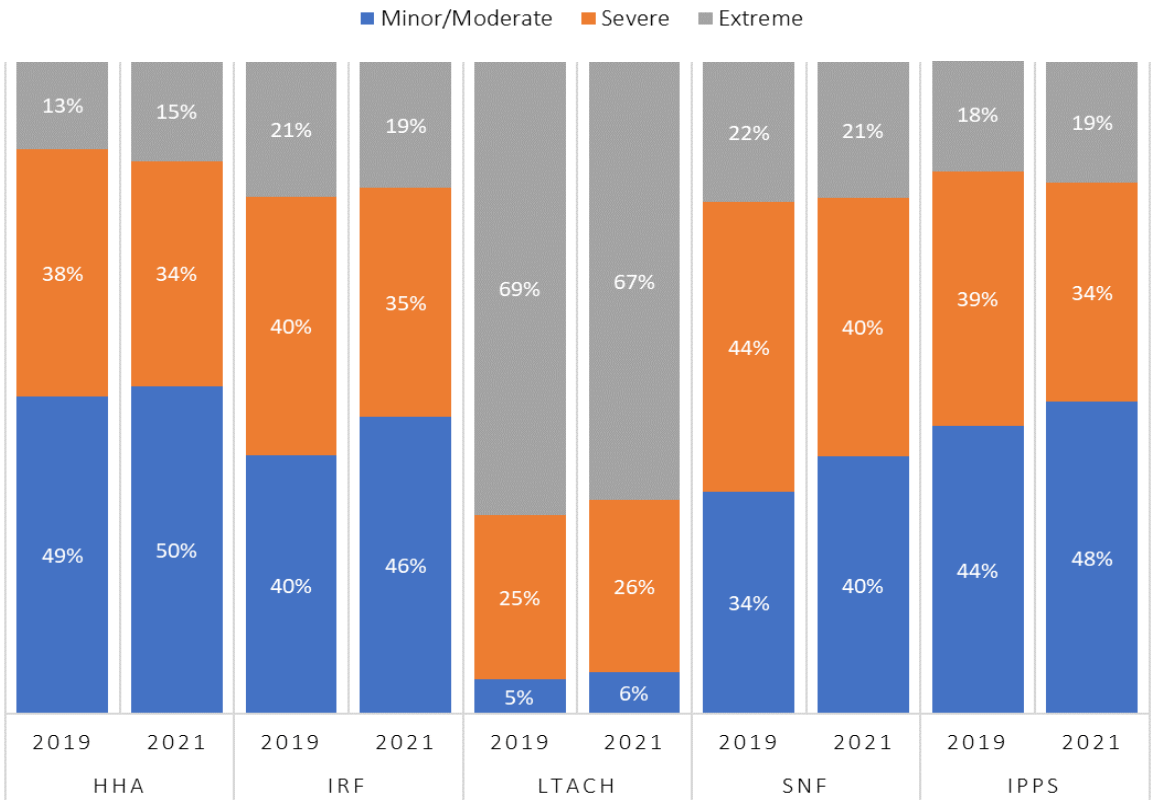
We compared LTACH patients transferred from an IPPS hospital to all Medicare fee-for-service (FFS) patients discharged from an IPPS hospital (including those discharged to an LTACH) as well as the subset of patients admitted to another post-acute care (PAC) setting (skilled nursing facility (SNF), inpatient rehabilitation facility (IRF), or home health agency (HHA))[1] following an IPPS hospitalization.

Demographic Characteristics. In fiscal year (FY) 2021, Medicare beneficiaries transferred to LTACHs had an average age of 70 years old, younger than the average across all FFS Medicare beneficiaries discharged from IPPS hospitals (73 years) and those transferred to other settings: HHA (75 years), IRF (75 years), and SNF (78 years). In 2021, 23.7 percent of Medicare FFS patients in LTACHs were under the age of 65, while the share was only 16.6 percent among FFS Medicare beneficiaries discharged from an IPPS hospital. The lower age reflects a greater share of LTACH patients who qualified for Medicare due to a disability or end-stage renal disease. Patients transferred to an LTACH were also more likely to be non-White beneficiaries (27.4% vs. 19.5% for IPPS hospitals and 17.5% for HHA, the next highest setting) and Medicare-Medicaid eligible (dual eligible), although the dual eligible shares were similar for LTACH and SNF (35.5% vs. 34.1% for SNF; next highest was HHA: 17.5%).

Clinical Characteristics. We used the All Patient Refined-Diagnosis Related Grouper (APR-DRG) Severity of Illness (SOI) score from 3M™ to classify patients based on their severity (Figure 1). In 2019, 69 percent of LTACH patients were classified as "extreme" severity according to the APR-DRG SOI method. For all Medicare FFS IPPS hospital discharges, the share was 18 percent, and, for other PAC settings, the share classified as extreme SOI ranged from 13 to 22 percent. Results were similar for 2021. The higher SOI for LTACH patients reflects greater rates of multiple organ failure (2 or more major organ systems) (FY 2021: 58.6% vs. 31.0% for SNF, the next highest group), greater rates of ventilator use (FY 2021: 34.7% vs. 2.6% for IRF, the next highest setting), and higher number of MCCs (using CMS definition) (FY 2021: 2.8 vs. 0.84 for SNF, the next highest setting).

[1] Although LTACHs are acute care hospitals, they are often considered part of the post-acute care (PAC) continuum, because roughly 90 percent of Medicare admissions to an LTACH come directly from an IPPS hospital.

Figure 1. Distribution of Cases by Severity Levels and PAC Setting in 2019 and 2021




Source: KNG Health Consulting analysis of 2021 Standard Analytic Files and 3M APR-DRG software.
Notes: IPPS = Inpatient Prospective Payment System; IRF = Inpatient Rehabilitation Facility; SNF = Skilled Nursing Facility; HHA = Home Health Agency.

**Resource Use.** In FY 2021, LTACH transfers had much longer average intensive care unit (ICU) stays (12.3 days) than the Medicare IPPS population (2.0 days) and those transferred to HHA (1.9 days), IRF (3.3 days), and SNF (2.4 days) as well as longer total IPPS hospital lengths of stay (17.4 days vs. SNF: 7.6 days, next highest setting). For LTACH transfers, 21.6 percent of Medicare beneficiaries were classified as high-cost outliers under the IPPS; the PAC setting with the next highest rate was IRFs at 7.8 percent. By comparison, only 3 percent of all Medicare FFS discharges from an IPPS hospital had costs relative to payments high enough to meet outlier status.

## 3. Reason for LTACH Admission and Concentration of Cases and Payments

Patients admitted to LTACHs tended to be highly concentrated in a small number of MS-LTC-DRGs. The high concentration of LTACH cases reflects these specialty hospitals' focus on chronically ill and medically complex patients, further reinforced by the introduction of payment criteria in 2016. In this section, we focus on standard rate cases at LTACHs (i.e., those meeting payment criteria as discussed in Text Box 1), since LTACHs are paid for these cases under the LTACH PPS.

**Cases, Costs, Payments, and Outlier Payments.** For FY 2022, we found that the top 20 MS-LTC-DRGs accounted for 78 percent of LTACH cases,

83 percent of total LTACH costs and payments, and 86 percent of total outlier payments (Table 1). The concentration of cases, costs, and payments for LTACHs has increased over time, with cases accounted for by the top 20 MS-LTC-DRGs increasing from 75 to 78 percent, costs increasing from 79 to 83 percent, and outlier payments increasing from 82 to 86 percent from 2018 to 2022.

Across the top 20 MS-LTC-DRGs, 15 include a designation of MCC. The remaining 5 are part of MS-LTC-DRG families that do not depend on presence of a CC or MCC. These 5 include: MS-LTC-DRG 189 (Pulmonary edema and respiratory failure); 207 (Respiratory system diagnosis with ventilator support > 96 hours); 208 (Respiratory system diagnosis with ventilator support <= 96 hours); 004 (ECMO or tracheostomy with MV >96 hours or principal diagnosis except face, mouth and neck); and 870 (Septicemia or severe sepsis with MV>96 hours).

The two most common MS-LTC-DRGs are 189 and 207. Together, these MS-LTC-DRGs accounted for 47 percent of all Medicare FFS LTACH cases and 50 percent of Medicare payments in FY 2022. MS-LTC-DRG 207 alone accounted for 45 percent of all Medicare FFS outlier payments to LTACHs.

IPPS hospitals exhibited less concentration of cases, payments, and outlier payments. In fiscal year 2022, the top 20 MS-DRGs at IPPS hospitals accounted for 36 percent of cases, 29 percent of payments, and 19 percent of outlier payments. The lower concentration of cases at IPPS hospitals reflects the general nature of care provided at these facilities and the treatment of lower severity cases.

Table 1. Top 20 MS-LTC-DRGs for FY 2022: Concentration of Cases, Costs, Payments, and Outlier Payments

| MS-LTC-DRG | DRG Title | Cases | Costs | Pay | Outlier Pay |
|---|---|---|---|---|---|
| 189 | Pulmonary edema and respiratory failure | 26% | 17% | 17% | 9% |
| 207 | Respiratory system diagnosis with ventilator support >96 hours | 21% | 34% | 33% | 45% |
| 208 | Respiratory system diagnosis with ventilator support <=96 hours | 4% | 3% | 3% | 2% |
| 177 | Respiratory infections and inflammations with MCC | 4% | 2% | 2% | 1% |
| 166 | Other respiratory system O.R. procedures with MCC | 3% | 6% | 6% | 7% |
| 871 | Septicemia or severe sepsis without MV >96 hours with MCC | 3% | 2% | 2% | 1% |
| 981 | Extensive O.R. procedures unrelated to principal diagnosis with MCC | 3% | 5% | 5% | 7% |
| 949 | Aftercare with CC/MCC | 2% | 1% | 1% | 1% |
| 4 | Tracheostomy with MV >96 hours or principal diagnosis except face/mouth/neck w/o major O.R. proc | 2% | 4% | 4% | 6% |
| 682 | Renal failure with MCC | 2% | 1% | 1% | 1% |
| 291 | Heart failure and shock with MCC | 1% | 1% | 1% | 1% |
| 539 | Osteomyelitis with MCC | 1% | 1% | 1% | 0% |
| 919 | Complications of treatment with MCC | 1% | 1% | 1% | 1% |
| 592 | Skin ulcers with MCC | 1% | 1% | 1% | 0% |
| 862 | Postoperative and post-traumatic infections with MCC | 1% | 1% | 1% | 0% |
| 314 | Other circulatory system diagnoses with MCC | 1% | 1% | 1% | 0% |
| 870 | Septicemia or severe sepsis with MV >96 hours | 1% | 2% | 2% | 2% |
| 559 | Aftercare, musculoskeletal system and connective tissue with MCC | 1% | 1% | 1% | 0% |
| 853 | Infectious and parasitic diseases with O.R. procedures with MCC | 1% | 1% | 1% | 1% |
| 56 | Degenerative nervous system disorders with MCC | 1% | 1% | 0% | 0% |
| | **Total for Top 20 MS-LTC-DRG** | **78%** | **83%** | **83%** | **86%** |

Source: KNG Health analysis of FY 2022 MedPAR file.

## 4. Payment-to-Cost (PCR) Ratios by Patient Complexity

Because LTACHs cases are concentrated in a small number of MS-LTC-DRGs, payment accuracy under the LTACH PPS is dependent on the ability of those DRGs to account for variation in patient costs. Medicare patients cared for at LTACHs are, on average, of higher complexity (and thus more costly) than patients treated in IPPS hospitals and PAC settings. These facts, combined with the generally small size of LTACHs, may make these specialty hospitals particularly vulnerable to high cost cases.

To begin to understand these issues, we examined how standardized costs vary with the number of CCs and MCCs a patient has, as recorded on the LTACH claim. We estimated the association between standardized LTACH cost[2] per case and number of CC/MCCs using data from 2018 to 2021. After controlling for year and MS-LTC-DRG, we found that each additional CC and MCC increased standardized costs by 2.6 and 3.5 percent, respectively.

We next used 2019 data[3] to examine the extent to which LTACH profitability (as measured by aggregate PCRs[4]) vary by patient complexity. Based on preliminary analyses, we decided to first form two groups of patients: (1) those with fewer than 6 CCs; and (2) those with 6 or more CCs. We then divided each of these groups into 3 groups based on number of MCCs: (1) 0-2 MCCs; (2) 3-5 MCCs; and (3) 6 or more MCCs. We then calculated the aggregate PCR for each combination (total of 6 groups).

We found that PCRs were less than 1.0 (i.e., costs exceed payments) for 3 of the 6 groups and that PCRs generally fall as patient complexity increases (Figure 2). Among the 3 patient groups with 6 or more CCs, we found that LTACHs received payments slightly more than costs for the first group (least complex of the 3 groups with 0-2 MCCs) but fell short of costs for the other two groups (3-5 MCCs and 6+ MCCs). For cases with 6 or more CCs and MCCs, we found that LTACHs received 89 cents for each dollar of cost in 2019. For 3 of the 6 groups, aggregate costs exceeded aggregate Medicare payments (PCR 0.98 for cases with fewer than 6 CCs but 6 or more MCCs; PCR 0.96 for cases with 6 or more CCs and 3-5 MCCs; and PCR 0.89 or cases with 6 or more CCs and 6 or more MCCs).

The finding of underpayment for the highest acuity cases does not necessarily represent a problem for the LTACH PPS. Medicare prospective payment systems are intended to pay appropriately on average. It is possible that LTACHs admit patients across a range of complexities, with high-complexity and costly cases being offset by lower-complexity and less costly cases.

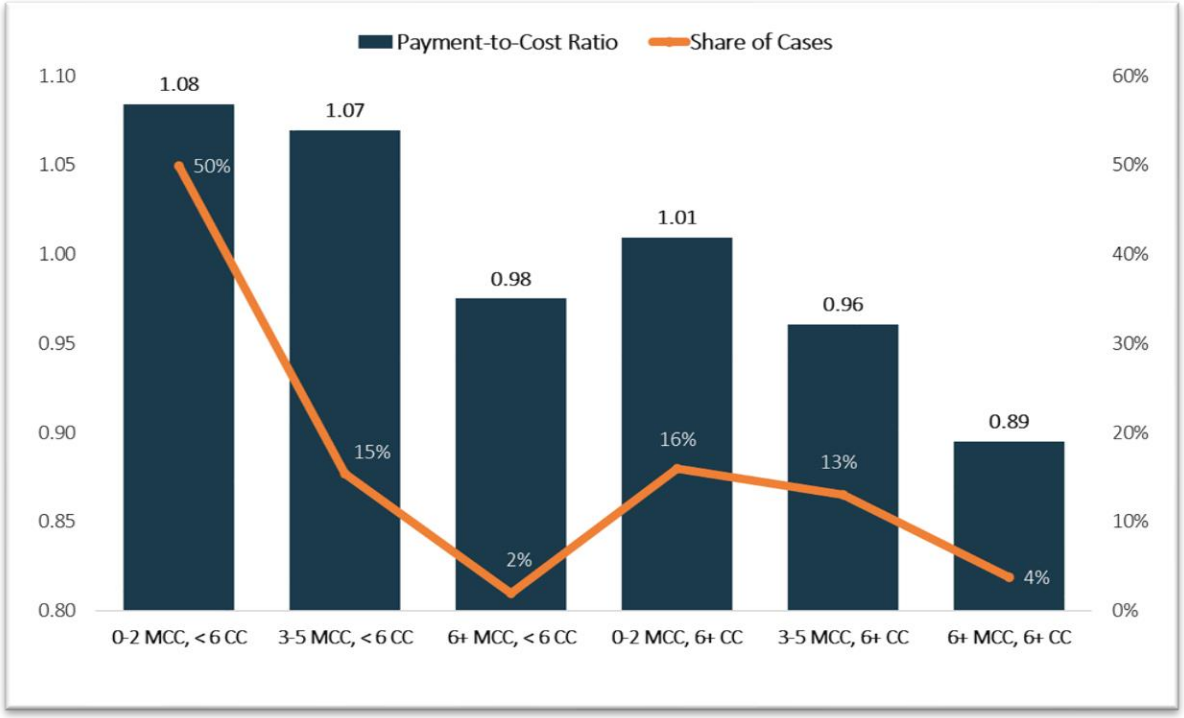
To assess this, we examined consistency over time in terms of the share of high-acuity cases treated at each LTACH. If an LTACH systematically admits higher acuity cases, then these LTACHs face systematically higher cost patients not fully accounted for by the payment system. First, we divided all LTACHs into 3 groups (terciles) based on the share of cases

[2] We standardized costs by MS-LTC-DRG weights, wage indexes, and short-stay outlier status.

[3] We used pre-COVID-19 data because of payment waivers and other temporary changes during the COVID-19 Public Health Emergency.

[4] We calculated aggregate PCRs by summing payments and dividing through by the sum of all costs for a patient group.

Figure 2. Payment-to-Cost Ratios by Patient Complexity Groups (2019)




Source: KNG Health analysis of 2019 Standard Analytic Files.

that fell into one of the 3 categories with PCRs less than 1.0 (Figure 2). We refer to these cases as "high acuity/low payment." We then examined the extent to which an LTACH remained in the same group ("high share"; "moderate share", "low share") across years.[5] We found:

- Between any two years from 2018 and 2022, 71-81 percent of LTACHs in the high share group in a year were also in the high share group in the following year.

- Among LTACHs in the high share group in 2018, almost half of them were also in the high share group in 2022. Similarly, slightly more than half of LTACHs in the low share group were also in the low share group in 2022.

Given the importance of MS-LTC-DRGs 189 and 207, we examined the correlation between years in terms of the share of high acuity/low payment cases for each of these MS-LTC-DRGs. In Figure 3, we show scatter plots of the share of high acuity/low payment cases by LTACH between 2018 and 2019 (left panels) and between 2020 and 2021 (right panels). Each point on the graphs represents a unique LTACH. The results show strong correlation in the share between years for both 189 and 207, although the relationship is weaker for 2020/2021 period. The weaker relationship between 2020 and

[5] The threshold to qualify as a "high share" LTACH was approximately 22 percent for each year. That is, an LTACH had at least 22 percent of its cases classified as high acuity/low payment in a given year to be identified as "high share."

Figure 3A. LTACH Correlation of High Acuity/Low Payment Shares Between Years: MS-LTC-DRG 189

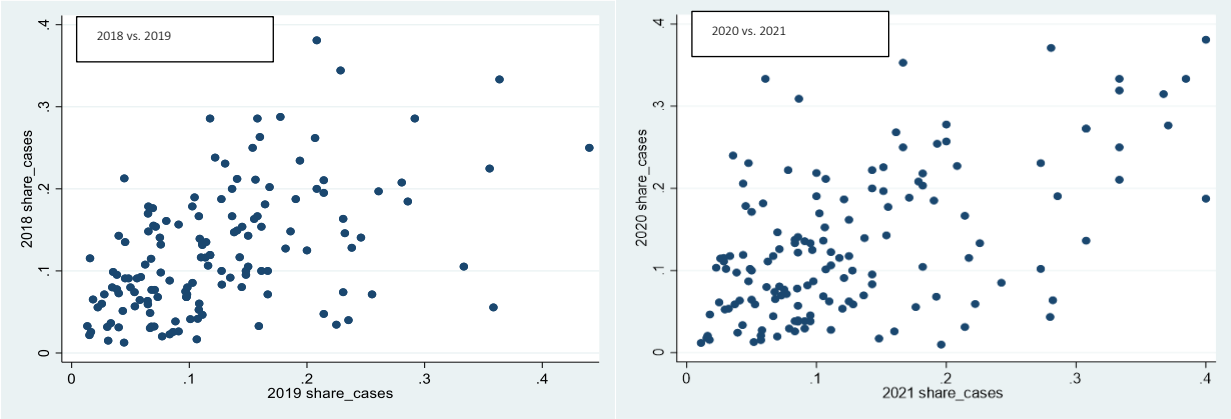
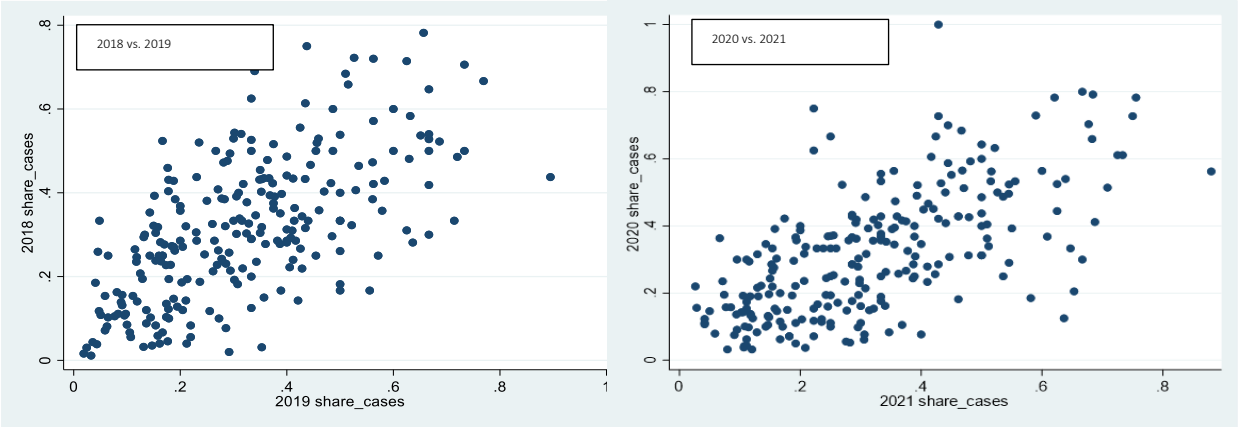



Figure 3B. LTACH Correlation of High Acuity/Low Payment Shares Between Years: MS-LTC-DRG 207




Source: KNG Health analysis of 2018-2021 Standard Analytic Files.
Notes: Each point on the graph represents an individual LTACH.

2021 may be related to changes in hospital case mix and discharge patterns during the COVID-19 public health emergency.

## 5. Implications

The relatively high complexity of patients receiving care at LTACHs and the high concentration of cases, payments, and outliers among a small set of MS-LTC-DRGs raise questions as to the effectiveness of the LTACH payment system. Specifically, a prospective payment system is intended to pay appropriately for cases on average. Loses and gains on high-cost and low-cost cases should balance out for relatively efficient hospitals. This can occur within a DRG, where an LTACH's losses on high-cost patients are offset by financial gains on clinically similar but low-cost cases. It can also occur across DRGs, where high-cost cases within certain DRGs are offset by low-cost cases in other DRGs. Both forms of subsidization minimize the losses or gains for any high-cost or low-cost cases.

The expansion of the DRG to MS-DRG (and MS-LTC-DRGs) was intended to better group clinically similar patients, in terms of high and

low complexity (and costliness). While an improvement relative to DRGs, the MS-DRG system only recognizes whether a patient has at least one CC or at least one MCC. For example, a patient admitted to an LTACH for the same reason would be grouped to the same MS-LTC-DRG regardless of if he or she had one MCC or 10. Moreover, there are some MS-LTC-DRGs that account for a large share of standard rate cases that do not differentiate based on presence of a CC or MCC. For example, the two most common MS-LTC-DRGs (189 and 207) do not have corresponding related DRGs that distinguish between cases with and without a CC or MCC.

The full implementation of the Medicare dual payment structure for LTACHs with admissions starting on or after May 12, 2023, will likely result in smaller volumes and further consolidation of the types of Medicare patients cared for at LTACHs. However, the LTACH PPS has not kept pace with patient mix and other changes. In the broader context of rising LTACH costs, staffing shortages, continued growth in Medicare Advantage, and relatively low financial margins, LTACHs face significant financial and other challenges.

Given the unique aspects of LTACHs relative to IPPS hospitals, review and refinement of the LTACH PPS may be needed to ensure continued access to these specialty hospitals. Specifically, our results indicate payment accuracy could be improved by increasing the number of case-mix categories under the LTACH PPS. For example, CMS could differentiate based on the number of CCs/MCCs of a patient and increase payments to LTACHs for higher acuity patients. Such changes could help stave off further contraction of the LTACH industry, particularly among those treating the most critically ill and medical complex.

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## Appendix: Methods Overview

Data: We used the 100% Inpatient Standard Analytic Files from 2017 Q4 to 2022 Q3 to examine LTACH stays. These files include discharge-level information for all Medicare fee-for-service stays at LTACHs and their prior STACH stays. We also used cost report data from the Healthcare Cost Report Information System (HCRIS) for 2016 to 2022 to calculate payment-to-cost ratios (PCRs) for each provider.

Payment-to-Cost Ratios:

We calculated Medicare PCRs based on each provider's cost-to-charge ratio (CCRs) using LTACH-specific Medicare costs and charges reported on cost reports. Since provider cost reporting periods vary, we mapped a CCR value to claims for each LTACH using the cost report whose midpoint of its reporting period fell within the Federal Fiscal year applicable to a claim (based on discharge date). To calculate an LTACH Medicare CCR we followed the methodology described on page 270 of https://www.cms.gov/regulations-and-guidance/guidance/manuals/downloads/clm104c03.pdf. The formulas and specific cost report locations for the calculation of Medicare costs and Medicare charges are provided below. The CCR is simply the Medicare inpatient costs divided by the Medicare inpatient charges.

Medicare Inpatient Costs
= Worksheet D-1, Part II, Column 1, Line 49
- Worksheet D, Part III, Column 9, line 30
- Worksheet D, Part III, Column 9, line 31
- Worksheet D, Part III, Column 9, line 32
- Worksheet D, Part III, Column 9, line 33
- Worksheet D, Part III, Column 9, line 34
- Worksheet D, Part III, Column 9, line 35
- Worksheet D, Part IV, Column 11, line 200

Medicare Inpatient Charges
= Worksheet D-3, Column 2, line 30
+ Worksheet D-3, Column 2, line 31
+ Worksheet D-3, Column 2, line 32
+ Worksheet D-3, Column 2, line 33
+ Worksheet D-3, Column 2, line 34
+ Worksheet D-3, Column 2, line 35
+ Worksheet D-3, Column 2, line 202

We calculated costs for each LTACH, claim, and year, by multiplying covered charges by the applicable CCR. We then aggregated costs and Medicare payments at the provider level to calculate an LTCH-level PCR for each year.