

# Variability in average length of stay for skilled nursing facilities – Opportunities exist for more efficient management

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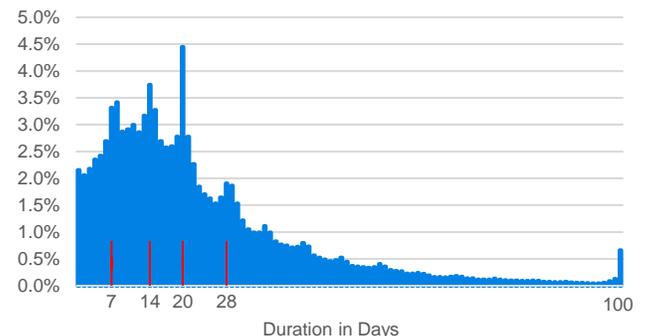


There is significant variation in skilled nursing facility (SNF) average length of stay (ALOS) among Medicare beneficiaries admitted to a SNF after an acute inpatient hospital stay. This variation is unexplained by differences in patient case mix and highlights the opportunity for more efficient management of LOS.

Skilled nursing facility services represent a significant proportion of Medicare fee-for-service (FFS) expenditures. In 2018, a Medicare Payment Advisory Commission (MedPAC) report noted "almost 1.5 million Medicare FFS beneficiaries (4 percent of Medicare Part A FFS beneficiaries) used SNF services at least once; program spending on SNF services was \$28.5 billion (about 7 percent of FFS spending).<sup>1</sup> Medicare's median payment per day was \$487, and its median payment per stay was \$18,247."<sup>2</sup> Reducing medically unnecessary days from a SNF stay can have a substantial impact on Medicare spend because SNFs are paid on a per diem basis.

To better understand variation among SNF lengths of stay, Milliman conducted an analysis of all SNF stays in the United States, using the 2017-2018 Medicare 100% Limited Data Set (LDS) and plotted the LOS of each SNF stay in Figure 1. The SNF stays are limited to admissions between September 22, 2017, and September 22, 2018, for SNFs with 100 or more annual admissions. We identified a pattern of SNF LOS that correlates with Medicare's SNF benefit coverage policy. There is a dramatic spike in LOS at 20 days, which corresponds to beneficiary cost sharing starting at day 21. Medicare pays 100% of SNF stay costs for the first 20 days, and beneficiaries pay \$176 per day (the 2020 rate) from day 21 to 100. There is another spike in LOS at 100 days when beneficiaries become 100% responsible for SNF payment. We also observe spikes at seven days, 14 days, and 28 days, corresponding to common SNF practice patterns that evaluate the need for continued stay on a weekly basis as opposed to a daily basis.

FIGURE 1: SNF LENGTH OF STAY DISTRIBUTION (58,000 STAYS)



Source: Milliman analysis of the 2017-18 Medicare 100% LDS.

Identifying SNFs that efficiently manage ALOS is of interest to several stakeholders, including Medicare Advantage (MA) plans, Medicare accountable care organizations (ACOs) and Medicare Bundled Payment for Care Improvement Advanced (BPCIA) and Comprehensive Care for Joint Replacement (CJR) participants. For each of these organizations, choosing SNFs that more efficiently manage the LOS of their members or attributed beneficiaries can result in cost savings opportunities. Yet identifying efficient SNF management by simply comparing ALOS among SNFs may not account for differences in the case mix of patients admitted to each SNF.

<sup>1</sup> Boards of Trustees 2019, Office of the Actuary 2019b

<sup>2</sup> MedPAC (March 2020). Report to the Congress: Medicare Payment Policy. Chapter 8: Skilled Nursing Facility Services. Retrieved January 8, 2021, from [http://www.medpac.gov/docs/default-source/reports/mar20\\_medpac\\_ch8\\_sec.pdf](http://www.medpac.gov/docs/default-source/reports/mar20_medpac_ch8_sec.pdf).

In order to compare ALOS between SNFs, risk adjustment is warranted to allow for relevant differences in the characteristics of a SNF's patient population, which may influence LOS. We developed a risk adjuster to more credibly compare ALOS between SNFs. We describe our methodology and findings below.

## Risk adjustment methodology

To develop a risk adjustment methodology that allows for capture of stays of 100 days or longer, we used the Medicare 100% LDS to identify SNF stays with admission dates between September 22, 2017, and September 22, 2018. This included all cases with discharge dates through December 31, 2018. We constructed a multiple linear regression model to predict the complexity of patients at the time of their admissions. The patient characteristics that were considered to potentially influence SNF LOS and used to assemble predictive model inputs are shown in Table 1. We utilized the Centers for Medicare and Medicaid Services (CMS) Fiscal Year Inpatient Prospective Payment System (IPPS) Final Rule and Correction Notices resource file to identify the CMS Certification Numbers (CCN) of teaching hospitals.

**TABLE 1: MODEL INPUT SUMMARY**

MODEL INPUT CATEGORY	MODEL INPUT
Patient Demographics	Sex
	Age at SNF Admission
	Dual Eligibility Status
	Race
	Institutional Status
Patient Health Status	Alzheimer's Status
	Cognitive Disabilities Indication
	CMS HCC Risk Score (V. 22)
	Charlson Comorbidity Categories
	Count of DME Claims in 360 Days Prior
	Count of Inpatient Admits in 90 Days Prior
	Count of Hospice Claims in 90 Days Prior
Preceding Inpatient Stay	Surgical Admission Indicator
	Hospital Teaching Status
	DRG
	Length of Stay
	Admission Type
	Number of Days in ICU

In order to balance predictive accuracy and model simplicity, the final linear model was chosen using the backward stepwise regression procedure that selects the predictive model to use for SNF evaluation based on the lowest value of the Akaike Information Criterion (AIC). This procedure takes all model inputs and builds subsequent regressions by iteratively fitting models that remove the weakest model input, ultimately choosing a final set of model inputs that balances the risk of overfitting against the risk of underfitting.

## Findings

To examine regional variation in SNF ALOS, we assigned each SNF to one of the 306 Dartmouth Atlas hospital referral regions (HRRs) (<https://www.dartmouthatlas.org>) based on SNF geographic location. Table 2 provides the raw and risk-adjusted ALOS for all SNF stays in the 10 HRRs with the highest volume of annual SNF admits. Among these 10 HRRs, SNF ALOS ranges from 18.2 to 28.1 days, and risk-adjusted ALOS ranges from 18.6 to 27.6 days.

**TABLE 2: ALOS FOR TOP 10 HRRS WITH HIGHEST ANNUAL SNF ADMITS**

HRR	# OF SNF ADMITS	SNF ALOS	RISK-ADJUSTED SNF ALOS
Boston - MA	22,948	18.2	18.6
Philadelphia - PA	13,912	20.7	20.6
Camden - NJ	15,305	21.3	21.6
Atlanta - GA	11,620	24.6	23.5
Baltimore - MD	11,526	24.2	23.7
Dallas - TX	11,181	24.3	24.2
Orlando - FL	13,499	24.9	24.6
Indianapolis - IN	12,003	24.8	25.5
Los Angeles - CA	17,472	27.4	26.4
East Long Island - NY	17,173	28.1	27.6

Source: Analysis of the 2019 Medicare 100% LDS, limited to SNFs with > 100 annual admissions, SNF admissions between Sept. 2017 and Sept. 2018.

To illustrate variation among SNFs within an HRR, we provide a sample from one HRR: Baltimore, Maryland. Table 3 displays results of the 20 SNFs with the highest volume of annual stays. These results show significant variation in ALOS among SNFs within the same HRR. ALOS ranges from 15.4 to 35.5 days, and risk-adjusted ALOS ranges from 15.2 to 35.9 days.

TABLE 3: ALOS FOR TOP 20 VOLUME SNFS IN BALTIMORE MD HRR

SNF #	# SNF ADMITS	SNF ALOS	AVERAGE PATIENT PROFILE RISK SCORE	RISK-ADJUSTED SNF ALOS
1	370	15.4	1.01	15.2
2	297	15.6	0.99	15.8
3	257	16.0	0.94	17.0
4	206	17.8	1.01	17.6
5	187	20.4	1.09	18.8
6	332	18.8	0.99	19.0
7	278	19.8	1.01	19.6
8	188	20.2	1.00	20.1
9	213	21.4	1.03	20.8
10	212	21.8	1.02	21.4
11	329	20.9	0.98	21.4
12	214	22.1	1.03	21.4
13	344	21.6	1.01	21.4
14	174	21.9	0.97	22.5
15	182	25.6	1.00	25.5
16	283	26.7	0.98	27.3
17	185	28.2	1.01	27.8
18	231	27.7	0.98	28.2
19	195	33.9	1.03	33.1
20	297	35.5	0.99	35.9

Source: Analysis of the 2019 Medicare 100% LDS, limited to SNFs with > 100 annual admissions, SNF admissions between Sept. 2017 and Sept. 2018.

Patient profile risk score is the ratio of the actual ALOS over the risk-adjusted ALOS

## Conclusion

On a risk-adjusted basis, we found significant variation in SNF ALOS by region and by individual facilities within regions. For SNFs with 100 or more annual stays, the average patient profile risk score did not vary dramatically, further supporting the finding that, even without risk adjustment for key patient characteristics, the average number of days that beneficiaries are kept in SNFs before discharge is driven by the SNF's unique practice patterns. These findings support the opportunity for better management of SNF LOS, which may have significant cost reduction opportunity. The new SNF payment model – the Patient Driven Payment Model (PDPM), which became effective October 1, 2019 – reduces per diem payments for longer stays, which may result in less facility to facility variation in risk-adjusted LOS over time. However, given the large amount of variation present today, we expect some will persist.

Along with evaluating the ALOS for a SNF, readmission rates back to acute care hospitals from SNFs should be evaluated. If ALOS is declining along with an increase in readmissions back to acute care hospitals, a quality issue may be apparent. In addition, as the overall rate of SNF admissions declines and more beneficiaries are discharged from acute care hospital stays to the community, the remaining SNF stays may be more complex and may require longer lengths of stay.



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