

Heart Failure Admissions: Cost Implications of Potentially Avoidable Inpatient Care

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Heart failure (HF) represents one of the most pressing cardiovascular health challenges facing the United States (US). According to the CDC, Heart failure occurs when the heart cannot pump enough blood and oxygen to meet the body's needs. Although it is a serious condition, it does not mean that the heart has stopped beating.¹ With an estimated 6.7 million Americans living with heart failure, continued attention to reducing both incidence and potentially avoidable complications and associated cost remains a high population health priority.¹ A significant portion of expenses attributed to heart failure arises from hospital-related services, with associated costs reaching upwards of \$18 billion.² These figures reflect a material strain on the total cost of care borne by the U.S. healthcare system.³

Through this paper, we want to demonstrate how administrative data can be leveraged to identify sub-populations at risk, quantify the financial impact of preventable heart failure admissions, and guide tailored interventions.

Background

Ample evidence exists to demonstrate that adherence to best-practice clinical standards is associated with decreases in potentially avoidable complications, including hospitalization and associated costs.⁴ In this paper, the term “potentially avoidable” is used to acknowledge that not all hospital admissions can be prevented and that individual clinical circumstances vary.⁵ Rather than judging the appropriateness of a specific hospitalization, the concept is intended to identify patterns at a population level that may indicate opportunities to improve care delivery, care coordination, and health outcomes.

Despite efforts to increase awareness of and adherence to these treatment guidelines and protocols, including those set by the American College of Cardiology Foundation/American Heart Association (ACCF/AHA), such as the use of guideline-directed medical therapy (GDMT) along with, but not limited to, regular monitoring of symptoms, biomarkers, and comorbidities, HF admission rates have not changed significantly over time.⁶

As per the U.S. Department of Health and Human Services, HF-related hospital admission rates have remained above the national target of 330.2 hospitalizations per 100,000 adults, showing no measurable progress toward reduction between 2019 and 2020. Whereas in 2021, hospitalizations rose to 374.0 per 100,000 adults, exceeding the national target.⁷

To address these concerning trends, multiple federal and nonprofit organizations have developed measures to monitor HF admission rates and track clinical performance and outcomes. For example, the National Committee for Quality Assurance (NCQA) uses measures such as SPC (Statin Therapy for Patients with Cardiovascular Disease)⁸ and CRE (Cardiac Rehabilitation)⁹ to track preventive care and rehabilitation participation. The Agency for Healthcare Research and Quality (AHRQ)⁵ uses measures such as PQI 08 (Heart Failure Admission Rate)¹⁰ and IQL-16 (Heart Failure Mortality Rate) to assess potentially avoidable hospitalizations and inpatient mortality. Meanwhile, the Centers for Medicare & Medicaid Services (CMS) employs All-Cause Unplanned Acute Admissions for Members with Multiple Chronic Conditions (including HF) to monitor unplanned acute admissions. Together, these measures can provide a comprehensive framework for evaluating HF care across the care continuum of prevention, inpatient management, and post-discharge, and can be incorporated into risk-based reimbursement models that align financial incentives with demonstrated adherence to these measures.

Methodology

We sought to focus on identifying those individuals with HF associated with potentially avoidable admissions. Specifically, our analysis used Prevention Quality Indicator 08 (PQI 08), developed by AHRQ, which relies on hospital discharge data to identify potentially avoidable hospitalizations that could have been prevented through timely and effective pre-emptive best practices such as outpatient care, care coordination, and proactive member outreach. Our primary objectives were:

1. To examine the frequency of these potentially avoidable HF inpatient admissions,
2. To estimate the observed rate of PQI-08 heart failure admissions within our dataset to better characterize potentially avoidable inpatient utilization, and
3. To further characterize the related cost implications.

The AHRQ PQI 08 is a critical measure of outpatient care quality. It highlights potentially preventable hospitalizations that may signal gaps in patient education, medication adherence, and follow-up care. At the same time, PQI 08 draws attention to inpatient admissions that could be reduced through stronger chronic disease management, care coordination, and preventive strategies. According to AHRQ benchmark data for 2024, the overall PQI 08 rate was 401.18 hospitalizations per 100,000 adults aged 18 years and older.¹¹ These benchmarks are derived from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases, which contain all-payer inpatient discharge data. By tracking this measure, healthcare systems and stakeholders can better align with value-based care objectives, reduce unnecessary utilization, and improve patient outcomes, thereby linking clinical quality improvement efforts with financial sustainability.

Analysis

Our analysis presented here is based on raw, unnormalized data and was not validated using advanced statistical methods. As such, findings may be influenced by differences in data scale, distribution, and potential outliers. Variations could also reflect factors such as primary care availability, member health status, or other random and non-random influences that contribute to avoidable inpatient admissions in certain populations or regions. Readers should interpret the results with caution, recognizing that further normalization and statistical validation would be needed for more robust conclusions.

This analysis illustrates how Milliman MedInsight (MedInsight) evidence-based measures can be used to examine avoidable inpatient admissions within the heart failure population. We conducted a retrospective cohort

study using 2024 data from the MedInsight Emerging Experience database, covering over 67.2 million individuals aged 18 and older across major U.S. health plans and all lines of business.

Our analysis identified heart failure diagnoses (in any claim position) in nearly 0.86 million members. [Figure 1](#) represents the distribution of claim types incurred by the HF population (Inpatient, Outpatient, and Professional) by line of business (LOB): Commercial (COM), Medicaid (MCD) and Medicare (MCR). [Figure 2](#) illustrates the percentage distribution of the associated costs across those service types by LOB.

As reflected in [Figure 1](#), professional services account for the highest percentage of claim types (COM: 76%, MCD: 78%, MCR: 78%) yet represent a much smaller share of the total allowed amount (COM: 5%, MCD: 11%, MCR: 14%) as shown in [Figure 2](#). In contrast, inpatient services, while comprising a lower proportion of patient activity (COM: 6%, MCD: 7%, MCR: 7%), are responsible for the largest share of costs (COM: 75%, MCD: 77%, MCR: 73%).

Figure 1: Distribution of Service Type Volume for HF Members by LOB

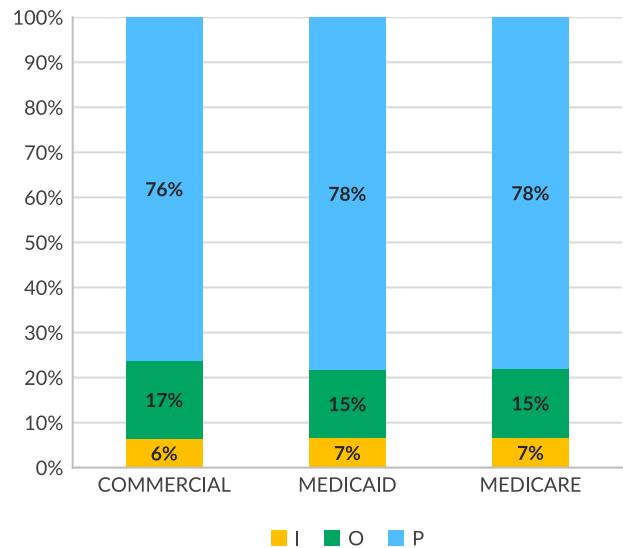
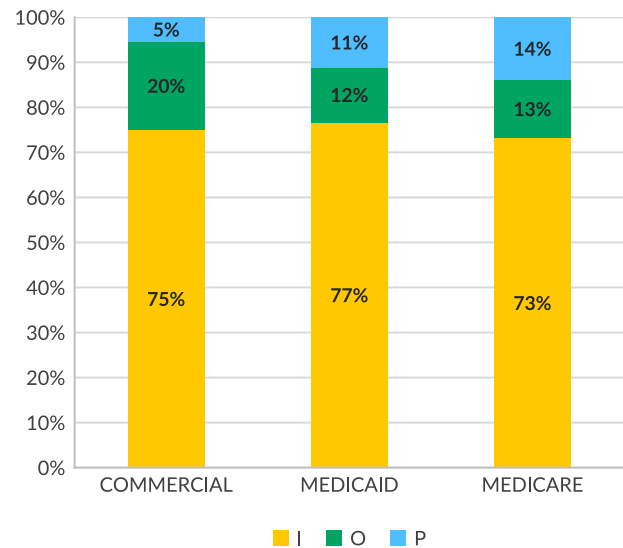


Figure 2: Distribution of Costs by Service Type for HF Members by LOB



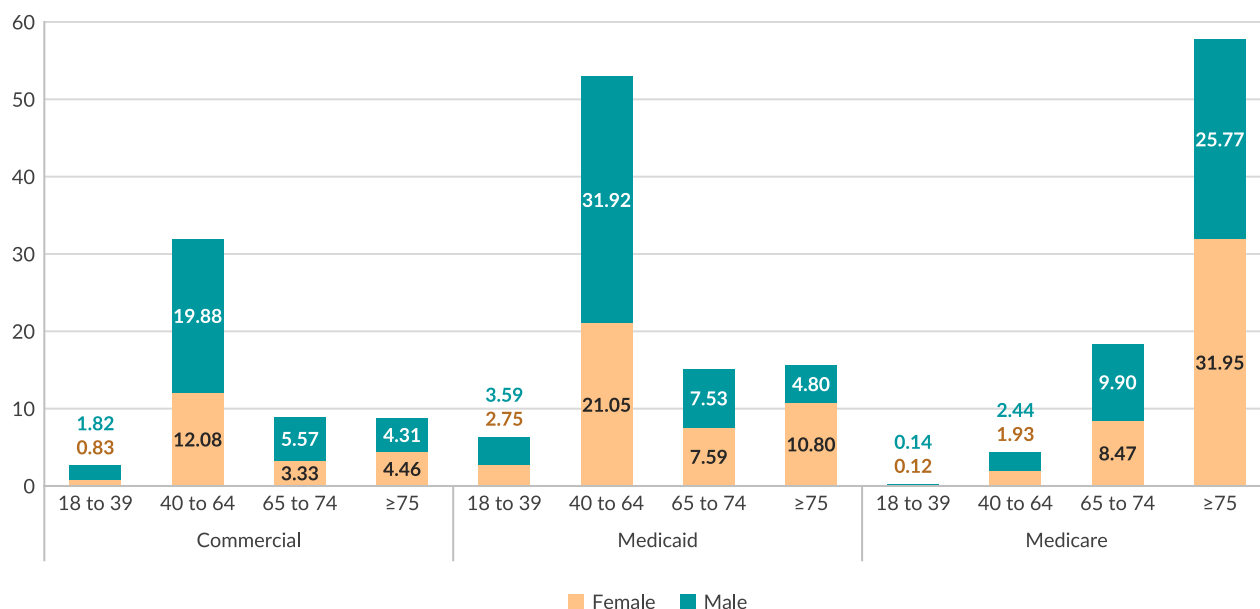
We reviewed the rates of inpatient hospitalization utilization for the HF members by LOB and further drilled down to HF admissions to evaluate the opportunity to reduce avoidable inpatient, hospital-based care. To ensure our focus was on the subset of potentially avoidable heart failure admissions from the overall hospitalized population, we applied the specifications of the AHRQ PQI 08 measure. Adhering to the measure definition, we included only inpatient admissions with heart failure in the primary position of the inpatient claim and excluded the following:

- Hospitalizations involving cardiac procedures
- Admissions with obstetric diagnoses
- Admissions from other hospitals or healthcare facilities
- Transfers from hospitals
- Transfers from skilled nursing facilities (SNF)
- Transfers from intermediate care facilities (ICF)
- Transfers from other healthcare facilities
- Hospitalizations with ungroupable DRGs

These exclusions reflect admissions that are associated with planned interventions, conditions unrelated to heart failure, or continuation of care from another institution, rather than admissions that may be influenced by the quality or accessibility of outpatient management. By applying these exclusions, the measure more accurately identifies hospitalizations that could have been potentially avoided through improved outpatient management, care coordination, and preventive interventions.

After applying the exclusions described above, we analyzed the distribution of HF members by gender, age, and LOB, expressing the results as the number of HF members per 1,000 total HF members in each subgroup within the corresponding LOB. As shown in [Figure 3](#), the Medicare HF population is concentrated in the ≥75 years age group, whereas the Medicaid and Commercial HF populations are more concentrated in the 40–64 years age group.

Figure 3: Age-Gender-Based Incidence of HF Admissions (per 1000 HF population) by LOB



To further understand spending patterns associated with potentially avoidable HF admissions across care settings, we compared per-member-per-month (PMPM)* for members meeting AHRQ PQI 08 criteria (HF as the primary diagnosis for an inpatient admission after applying measure exclusions) with a broader comparator group (members with any visit type with HF as primary but not part of the PQI 08 numerator). Note that the comparator group had the members who might have been admitted to the hospital for conditions unrelated to heart failure. We summarized the results by LOB to highlight variation in spending patterns across Commercial, Medicaid, and Medicare populations.

**PMPM: per-member-per-month, a cost metric that calculates the average monthly healthcare spending or utilization per patient across a given population.*

Based on the findings in [Table 1](#), we observed that inpatient (IP) PMPM is higher for the potentially avoidable HF cohort than for the comparator group across all three LOBs. The difference is quite pronounced in the Commercial population, while Medicaid and Medicare show smaller but consistent differences.

Because heart failure can be managed more cost effectively outside of the hospital as shown in [Figures 1 and 2](#), we next evaluated outpatient and professional visits (OP/PROF) spending for these same groups. As shown in [Table 2](#), the Numerator OP/PROF PMPM is also higher than that of the comparator OP/PROF group across Commercial, Medicaid and Medicare.

Table 1: Total IP cost and \$PMPM for the potentially avoidable HF cohort v/s Comparator cohort

PAYER_LOB	Total_IP_COST (\$)	NUMERATOR_IP_PMPM (\$)	COMPARATOR_IP_COST (\$)	COMPARATOR_IP_PMPM (\$)
COMMERCIAL	714,934,370	3,666	4,163,045,138	2,424
MEDICAID	341,941,322	1,984	1,355,761,845	1,462
MEDICARE	882,320,148	1,899	4,816,423,808	1,583

Table 2: Total OP/professional cost and \$PMPM for the potentially avoidable HF cohort v/s Comparator cohort

PAYER_LOB	Total_OP_PROF_COST (\$)	NUMERATOR_OP_PROF_PMPM (\$)	COMPARATOR_OP_PROF_COST (\$)	COMPARATOR_OP_PROF_PMPM (\$)
COMMERCIAL	719,242,241	3,688	4,232,267,937	2,464
MEDICAID	573,233,621	3,327	2,321,152,433	2,503
MEDICARE	1,365,879,658	2,941	6,206,452,346	2,039

The analysis of PMPM across care settings highlights distinct cost patterns for members with potentially avoidable HF admissions compared with the broader HF comparator cohort. As shown in [Table 1](#), inpatient (IP) PMPM is consistently higher across all LOBs, indicating a greater burden of avoidable hospital-based care. At the same time, [Table 2](#) demonstrates that outpatient and professional (OP/PROF) PMPM is also higher for this population relative to the comparator group. The elevated OP/PROF utilization may reflect increased engagement with outpatient care, including ongoing disease management, specialist involvement, and post-discharge follow-up. In this context, higher outpatient utilization may indicate that care is being delivered, at least in part, in lower-acuity settings rather than exclusively through inpatient hospitalization.

Together, these findings suggest that members with potentially avoidable HF admissions represent a clinically more complex population with higher healthcare utilization and costs across multiple care settings. The results highlight the substantial healthcare burden associated with these admissions and may indicate areas for further evaluation of outpatient care management, care coordination, and follow-up strategies for this high-risk population.

The findings, supported by evidence-based measures within the MedInsight Platform, more broadly suggest that outcomes may differ across populations and datasets, requiring different strategies to address avoidable heart failure admissions. Accordingly, continued use of PQI 08 remains important for identifying members who may benefit from enhanced care coordination, timely outpatient follow-up, and disease management interventions aimed at reducing preventable inpatient utilization.

Conclusion

Although our analysis was based on administrative data and did not directly measure the effects of patient education, counseling, early symptom recognition, medication adherence, or follow-up care, it clearly demonstrates the significant costs tied to heart failure hospitalizations. These constraints mean the findings highlight cost patterns but cannot establish causality or fully account for the broader social and behavioral determinants of health.

By prioritizing evidence-based, best-practice strategies coupled with data-driven insights to inform how to configure targeted initiatives to achieve the greatest impact, healthcare providers, insurers, and other key stakeholders can coordinate with one another more effectively to lower avoidable hospitalizations, improve the quality of life for those with heart failure, and ensure sustainable, high-quality care for all.

Leveraging PQI 08 alongside evidence-based measures within the MedInsight Platform can support efforts to improve population health, offering a comprehensive set of quality measures across multiple medical conditions to identify population segments that would benefit from more targeted interventions and to monitor the impact of those interventions. By leveraging these resources, healthcare organizations can better understand care patterns, allocate resources more effectively, and implement data-driven strategies that ultimately improve health outcomes for people living with heart failure.

References

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⁹ Cardiac Rehabilitation (CRE). Available at: [Cardiac Rehabilitation \(CRE\) - NCQA](#)

¹⁰ Prevention Quality Indicator 08 (PQI 08) Heart Failure Admission Rate. July 2024. Available at: [PQI 08 Heart Failure Admission Rate](#)

¹¹ Prevention Quality Indicators (PQI) Benchmark Data Tables, v2024. July 2024. Available at: [PQI Benchmark Tables, v2024](#)