ORIGINAL RESEARCH

Inpatient Utilization and Costs for Medicare Fee-for-Service Beneficiaries with Heart Failure

Kathryn Fitch, RN, MEd; Pamela M. Pelizzari, MPH; Bruce Pyenson, FSA, MAAA

BACKGROUND: Although the medical and economic burden of heart failure in the United States is already substantial, it will likely grow as the population ages and life expectancy increases. Not surprisingly, most of the heart failure burden is borne by individuals aged ≥65 years, many of whom are in the Medicare population. The population-based utilization and costs of inpatient care for Medicare beneficiaries with heart failure are not well understood by payers and providers.

OBJECTIVE: To create a real-world view of utilization and costs associated with inpatient admissions, readmissions, and admissions to skilled nursing facilities among Medicare fee-for-service (FFS) beneficiaries with heart failure.

METHODS: The study used the 2011 and 2012 Medicare 5% sample limited data set to perform a retrospective analysis of claims data. The look-back year that was used to identify certain patient characteristics was 2011, and 2012 was the analysis period for the study. Beneficiaries with heart failure were defined as those who had ≥1 acute inpatient, emergency department, nonacute inpatient, or outpatient claims in 2012 containing an International Classification of Diseases, Ninth Revision code for heart failure. To be included in the study, beneficiaries with heart failure had to have eligibility for ≥1 months in 2012 and in all 2011 months, with Part A and Part B eligibility in all the study months, and no enrollment in an HMO (Medicare Advantage plan). Utilization of inpatient admissions, inpatient readmissions, and skilled nursing facility admissions in 2012 were reported for Medicare FFS beneficiaries with heart failure and for all Medicare FFS beneficiaries. The costs for key metrics included all allowed Medicare payments in 2012 US dollars.

RESULTS: The 2012 Medicare FFS population for this study consisted of 1,461,935 patients (1,301,545 without heart failure; 160,390 with heart failure); the heart failure prevalence was 11%. The Medicare-allowed cost per member per month (PMPM) was $3395 for a patient with heart failure, whereas the allowed cost for the total Medicare population was $1045 PMPM. The Medicare–allowed amounts for the population with heart failure accounted for 34% of the total annual Medicare FFS population–allowed amounts. The heart failure population constituted 41.5%, 55.3%, and 49.5% of total Medicare FFS inpatient admissions, readmissions, and admissions to skilled nursing facilities, respectively. The costs of inpatient admissions, readmissions, and admissions to skilled nursing facilities among the heart failure population contributed $182 PMPM (17.5%), $58 PMPM (5.6%), and $46 PMPM (4.4%), respectively, to the total Medicare FFS population–allowed cost of $1045 PMPM.

CONCLUSIONS: Medicare FFS beneficiaries with heart failure have high inpatient admission and readmission rates and generate substantial costs. Because a substantial portion of all inpatient admissions are for Medicare beneficiaries with heart failure, it is reasonable for hospitals in Medicare accountable care organizations to focus on more aggressive post–acute care management, including a focus on reducing readmissions for the population with heart failure. Our study findings highlight areas of high service utilization and cost for Medicare patients with heart failure that can be of value to Medicare, Medicare Advantage plans, and providers.

KEY WORDS: healthcare costs, healthcare utilization, heart failure, inpatient admissions, inpatient readmissions, Medicare fee-for-service population, skilled nursing facilities

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Disclosures are at end of text
Heart failure is a chronic condition characterized by inability of the heart to maintain adequate blood flow to body tissues. In heart failure, the heart muscle weakens slowly over many years—a pattern of disease progression that contributes to high long-term healthcare resource utilization for patients with this condition. Although the medical and economic burden of heart failure in the United States is already substantial, it will likely grow as the population ages and life expectancy increases. Not surprisingly, most of the heart failure burden is borne by individuals aged ≥ 65 years, many of whom are Medicare beneficiaries.

At present, approximately 870,000 new cases of heart failure are diagnosed each year in the United States, and the incidence of heart failure is approaching 10 per 1000 individuals aged >65 years. Approximately 5.7 million individuals in the United States are currently living with heart failure, and estimates suggest that the prevalence will increase by approximately 46% in the next 15 years. If true, more than 8 million Americans will be living with heart failure in 2030.

Patients with heart failure have a high rate of hospital admission and readmission and generate substantial treatment-related costs. For example, a 2011 study showed that approximately 80% of Medicare beneficiaries with heart failure were hospitalized in their last 6 months of life. Heart failure is also the most common hospital discharge diagnosis for patients aged >65 years, and the number of patients discharged with this diagnosis remained nearly unchanged from 2000 to 2010 (1,008,000 vs 1,023,000, respectively). Among Medicare beneficiaries, admissions for heart failure have the highest rate of hospital readmission within 30 days of discharge. In 2012, the total direct medical cost for heart failure in the United States was $20.9 billion, a figure that is expected to increase to $53.1 billion by 2030. Overall, 80% of the costs attributed to heart failure are associated with hospitalization.

Although the aggregate current and projected costs of heart failure have been reported, there is a lack of claims-based studies quantifying the cost of heart failure in the Medicare population. For payers and providers managing healthcare costs for the Medicare population, the cost contributed by patients with heart failure, and the resource utilization of inpatient admissions and admissions to skilled nursing facilities are not well understood.

The purpose of the current study was to analyze the utilization and costs associated with inpatient admissions, readmissions, and admissions to skilled nursing facilities among Medicare fee-for-service (FFS) beneficiaries with heart failure.

### Methods

#### Study Design and Patient Population

We used the 2011-2012 Medicare 5% sample (limited data set) to perform a retrospective claims data analysis of the utilization and cost of inpatient admissions and readmissions for Medicare FFS beneficiaries with heart failure. The year 2011 was used as a look-back year, and 2012 was the analysis year for this study. This data set is made available to the public for research purposes by the Centers for Medicare & Medicaid Services (CMS), and it contains all Medicare FFS Part A and Part B paid claims generated by a statistically balanced sample of Medicare FFS beneficiaries. Prescription drug data were not included in this analysis. The claims include various codes (diagnosis, procedure, revenue, and diagnosis-related group), as well as information on the site of service, beneficiary age, monthly eligibility status, and monthly status of HMO or Medicare Advantage enrollment.

The study population was selected to have Medicare eligibility in all months of 2011 (to perform a look-back analysis), eligibility for ≥ 1 months in 2012, Part A and

### KEY POINTS

- In the United States, the medical and economic burden of heart failure is already substantial and is expected to grow as the population ages.
- This study used claims data to analyze utilization and costs for inpatient admissions and readmissions in Medicare FFS beneficiaries with heart failure, as well as total allowed costs for this population.
- Although heart failure prevalence was 11% in the total Medicare FFS population, patients with heart failure accounted for 34% of the total allowed costs.
- Patients with heart failure were responsible for 41.5% of all inpatient admissions, 55.3% readmissions, and 49.5% admissions to skilled nursing facilities among the study population.
- The total monthly per-member allowed costs were $3395 for the Medicare FFS population with heart failure and $1045 for the total Medicare FFS population.
- CMS has implemented new programs to improve the management of patients with heart failure and to reduce healthcare utilization and spending.
- Because a substantial portion of inpatient admissions and readmissions is for Medicare beneficiaries with heart failure, improving post–acute care for this population could reduce readmissions and costs.
Part B eligibility for all months of eligibility, and no
HMO or Medicare Advantage enrollment at any time
during the study period. Among all Medicare FFS be-
neficiaries meeting these criteria, heart failure benefici-
caries were identified as beneficiaries with ≥1 claims of the
Health Effectiveness Data and Information Set (HEDIS)-
specified types containing an International Classification of
Diseases, Ninth Revision (ICD-9) code for heart failure
(ie, 398.91, 402.01, 402.11, 402.91, 404.01, 404.03,
404.11, 404.13, 404.91, 404.93, 428.xx) in any position
of the claim during 2012. Qualifying claim types included
acute inpatient, emergency department, nonacute
inpatient, and outpatient care claims, as identified by
HEDIS-specified Current Procedural Terminology and
revenue codes.

These Medicare FFS beneficiaries with heart failure
were stratified into 5 status categories—aged/dual eligi-
ble, aged/not dual eligible, disabled, end-stage renal dis-
ease (ESRD), and institutionalized (non-ESRD). Death
dates were documented in the eligibility file for benefici-
caries who died in 2012, and mortality rates were calcu-
lated from this information.

We report utilization of inpatient admissions and ad-
misions to skilled nursing facilities per 1000 benefici-
caries for the Medicare FFS heart failure population and
the total Medicare FFS population. Inpatient admissions
included medical, surgical, psychiatric, substance abuse,
acute rehabilitation, and maternity admissions, unless
otherwise specified.

Inpatient and skilled nursing facility admission
claims were identified from the Medicare files. Profes-
sional and other claims incurred and paid during an
inpatient or a skilled nursing facility stay were identi-

Table 1 Demographics of Medicare FFS Study Population for 2012

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Total Medicare</th>
<th>Population with heart failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of population, N</td>
<td>1,461,935</td>
<td>160,390</td>
</tr>
<tr>
<td>Average age, yrs</td>
<td>71.7</td>
<td>77.5</td>
</tr>
<tr>
<td>Annual mortality rate, %</td>
<td>6.0</td>
<td>21.5</td>
</tr>
<tr>
<td>Allowed PPPM costs, $</td>
<td>1045</td>
<td>3395</td>
</tr>
<tr>
<td>Contribution to total Medicare FFS population allowed costs, %</td>
<td>100</td>
<td>34</td>
</tr>
</tbody>
</table>

*The study sample population required to have Medicare eligibility for all months of 2011 and ≥1 months of 2012; Part A and Part B eligibility for entire study period and no enrollment in an HMO or Medicare Advantage at any time during the study period.

FFS indicates fee-for-service; PPPM, per-patient per-month.


Table 2 Prevalence of Heart Failure in Medicare FFS Population, by Eligibility Status

<table>
<thead>
<tr>
<th>Eligibility status</th>
<th>Total Medicare FFS population, N (%)</th>
<th>Heart failure population, N (%)</th>
<th>Prevalence of heart failure, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged/dual eligible</td>
<td>127,748 (8.7)</td>
<td>20,593 (12.8)</td>
<td>16.1</td>
</tr>
<tr>
<td>Aged/not dual eligible</td>
<td>1,038,085 (71.0)</td>
<td>104,622 (65.2)</td>
<td>10.1</td>
</tr>
<tr>
<td>Disabled</td>
<td>229,957 (15.7)</td>
<td>13,085 (8.2)</td>
<td>5.7</td>
</tr>
<tr>
<td>ESRD</td>
<td>18,861 (1.2)</td>
<td>7307 (4.6)</td>
<td>42.8</td>
</tr>
<tr>
<td>Institutionalized (non-ESRD)</td>
<td>49,084 (3.4)</td>
<td>14,783 (9.2)</td>
<td>30.1</td>
</tr>
<tr>
<td>Total</td>
<td>1,461,935</td>
<td>160,390</td>
<td>11.0</td>
</tr>
</tbody>
</table>

ESRD indicates end-stage renal disease; FFS, fee-for-service.
Results

The total Medicare FFS population consisted of 1,461,935 patients (1,301,545 without heart failure; 160,390 with heart failure). The prevalence of heart failure among the total Medicare FFS population was 11%, and varied by Medicare status, ranging from 5.7% for the disabled category to 30.1% for the institutionalized (non-ESRD) category. The average age of the heart failure subset population was 77.5 years, which is substantially higher than that of the total Medicare FFS population (71.7 years). The mortality rate for the Medicare FFS population with heart failure (21.5%) was 3.5 times higher than that of the total Medicare FFS population (6.0%).

PMPM-allowed costs in the heart failure population subset and in the total Medicare FFS population were $3395 and $1045, respectively. The costs incurred by the heart failure population subset accounted for 34% of the total annual Medicare FFS population–allowed costs (Table 1 and Table 2).

The annual number of inpatient admissions per 1000 beneficiaries was 1307 in the heart failure population compared with 345 in the total Medicare FFS population.

### Table 3  Annual Inpatient Admission Utilization and Allowed Costs

<table>
<thead>
<tr>
<th></th>
<th>Total Medicare FFS population</th>
<th>Heart failure population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual inpatient adm. a per 1000 beneficiaries for indicated population, N</td>
<td>345</td>
<td>1307</td>
</tr>
<tr>
<td>Total Medicare FFS population inpatient admissions contributed by indicated population, %</td>
<td>100.0</td>
<td>41.5</td>
</tr>
<tr>
<td>Inpatient admission–allowed PPPM costs (facility and professional costs) for indicated population, $</td>
<td>413</td>
<td>1751</td>
</tr>
<tr>
<td>Percent of total allowed costs contributed by inpatient admissions (facility and professional costs) for indicated population, %</td>
<td>39.5</td>
<td>51.6</td>
</tr>
<tr>
<td>Total Medicare FFS–allowed PMPM costs contributed by inpatient admissions for indicated population, $</td>
<td>413</td>
<td>182</td>
</tr>
<tr>
<td>Percent of total Medicare FFS population–allowed costs contributed by inpatient admissions for indicated population, %</td>
<td>39.5</td>
<td>17.5</td>
</tr>
</tbody>
</table>

aAnnual inpatient admissions category includes medical, surgical, acute rehabilitation, psychiatric, substance abuse, and maternity admissions; inpatient admission rate includes readmissions.
bAllowed costs include patient cost-sharing.

FFS indicates fee-for-service; PMPM, per-member per-month; PPPM, per-patient per-month.


### Table 4  Annual All-Cause 30-Day Inpatient Readmission Utilization and Allowed Costs

<table>
<thead>
<tr>
<th></th>
<th>Total Medicare FFS population</th>
<th>Heart failure population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual inpatient adm. with a readmission, %</td>
<td>21.4</td>
<td>28.4</td>
</tr>
<tr>
<td>Total Medicare FFS population readmissions contributed by indicated population, %</td>
<td>100.0</td>
<td>55.3</td>
</tr>
<tr>
<td>Readmission-allowed PPPM costs  (facility and professional costs) for indicated population, $</td>
<td>99</td>
<td>557</td>
</tr>
<tr>
<td>Percent of total allowed costs contributed by readmissions (facility and professional costs) for indicated population, %</td>
<td>9.5</td>
<td>16.4</td>
</tr>
<tr>
<td>Total Medicare FFS–allowed PMPM costs contributed by readmissions by the indicated population, $</td>
<td>99</td>
<td>58</td>
</tr>
<tr>
<td>Percent of total Medicare FFS population–allowed cost contributed by readmission by the indicated population, %</td>
<td>9.5</td>
<td>5.6</td>
</tr>
</tbody>
</table>

aReadmission is defined as all-cause admissions occurring within 30 days of an acute inpatient admission, excluding transfers to other acute inpatient hospitals and admission to an acute care rehabilitation facility.
bAllowed costs include patient cost-sharing.

FFS indicates fee-for-service; PPPM, per-patient per-month.

Inpatient admissions for the heart failure population among Medicare FFS beneficiaries represented 41.5% of all inpatient admissions for the total Medicare FFS population. The costs of inpatient admissions (including facility payments and other Medicare FFS expenditures during those admissions) contributed a larger portion to the total allowed costs of the population with heart failure (51.6% of allowed cost) than that contributed by inpatient admissions in the total Medicare FFS population (39.5% of allowed cost). Inpatient costs for the heart failure population contributed $182 PMPM (or 17.5%) to the total Medicare FFS population–allowed cost of $1045 PMPM (Table 3).

The annual all-cause 30-day inpatient readmission rate was 28% for the Medicare FFS population with heart failure and 21% for the total Medicare FFS population. Inpatient readmissions for the heart failure subset represented 55.3% of all inpatient readmissions in the total Medicare FFS population. Readmission costs (including facility payments and other Medicare FFS expenditures during readmission stays) contributed a larger portion to the total allowed costs in the heart failure population (16.4%) than readmission costs in the total Medicare FFS population (9.5%). Readmission costs for the heart failure population contributed $182 PMPM (or 17.5%) to the total Medicare FFS population–allowed cost of $1045 PMPM (Table 3).

The annual number of admissions to skilled nursing facilities per 1000 beneficiaries was 356 in the heart failure population and 79 in the total Medicare FFS population. Admissions to skilled nursing facilities among Medicare FFS beneficiaries with heart failure represented 49.5% of skilled nursing facility admissions in the total Medicare FFS population. The costs associated with stays in skilled nursing facilities (including facility payments and other Medicare FFS expenditures during

| Table 5 | Annual Skilled Nursing Facility Utilization and Allowed Costs |
|-----------------|-----------------|-----------------|-----------------|
| Annual SNF admissions per 1000 beneficiaries for indicated population | 79 | 356 |
| Total FFS population SNF admissions contributed by indicated population, % | 100.0 | 49.5 |
| SNF admission PPM–allowed costs* (facility and professional costs) for indicated population, $ | 96 | 445 |
| Percent of total allowed costs* contributed by SNF admissions (facility and professional costs) for indicated population, % | 9.2 | 13.1 |
| Total Medicare FFS PPM–allowed costs* by SNF admissions by the indicated population, $ | 96 | 46 |
| Percent of total Medicare FFS population–allowed costs* contributed by SNF admissions by the indicated population, % | 9.2 | 4.4 |

*Allowed costs include patient cost-sharing.

FFS indicates fee-for-service; PPM, per-patient per-month; SNF, skilled nursing facility.


| Table 6 | Annual Inpatient Admissions Counts, per Medicare FFS Beneficiary |
|-----------------|-----------------|-----------------|
| Annual inpatient admission* count, per beneficiary | Percent of Medicare FFS population with heart failure with indicated number of inpatient admissions, % | Percent of total Medicare FFS population with indicated number of patient admissions, % |
| 1 | 28.7 | 12.7 |
| 2 | 15.4 | 4.1 |
| 3 | 7.7 | 1.6 |
| 4 | 3.9 | 0.7 |
| 5 | 2.1 | 0.4 |
| 6+ | 2.4 | 0.4 |
| Indicated population with ≥1 inpatient admissions annually, % | 60.2 | 19.8 |
| Indicated population with 0 inpatient admissions annually, % | 39.8 | 80.2 |

*Inpatient admissions include medical, surgical, acute rehabilitation, psychiatric, substance abuse, and maternity admissions.

FFS indicates fee-for-service.

those skilled nursing facility stays) contributed a larger portion to the total allowed costs in the heart failure population (13.1%) than skilled nursing facility costs in the total Medicare FFS population (9.2%). Skilled nursing facility costs for the heart failure population contributed $46 PMPM (or 4.4%) to the total Medicare FFS population allowed cost of $1045 PMPM (Table 5).

Compared with the total Medicare FFS population, substantially more beneficiaries with heart failure had ≥ 1 inpatient admissions (19.8% vs 60.2%, respectively) annually. The majority of the heart failure population with ≥ 1 inpatient admissions had ≥ 2 admissions annually (52.4%) compared with 36.2% in the total Medicare FFS population (Table 6).

Nearly half (49.2%) of the heart failure admissions were in 2 major diagnostic categories involving (1) diseases and disorders of the circulatory system, and (2) diseases and disorders of the respiratory system (Table 7). By contrast, only 35.1% of admissions for the total Medicare FFS population were in these 2 categories. MS-DRG codes 291, 292, and 293, which indicate admissions specific to heart failure and are within the “diseases and disorders of the circulatory system” category, accounted for 11% of inpatient admissions among the heart failure population (Table 7).

### Discussion

Our findings support earlier studies identifying the high utilization and cost of inpatient admissions and readmissions associated with the Medicare heart failure population. Specifically, we found that although the prevalence of heart failure was only 11% in the total Medicare FFS population, the heart failure subset population contributed 34% of the total allowed costs, 41.5% of total inpatient admissions, 55.3% of total readmissions, and 49.5% of the total admissions to skilled nursing facilities. We found that 51.6% of spending on the heart failure population was for inpatient admissions and another 13.1% was for skilled nursing facility admissions, a finding supported by a previous study, which estimated that 80% of the costs attributable to heart failure were associated with inpatient admissions (ie, admissions, readmissions, and skilled nursing facilities stays).

We did not analyze observation stays for heart failure, and we recognize that, with the increased focus on observation stays as a cost-mitigation measure for Medicare, it would be important to analyze potential changes in the distribution of inpatient versus observation services for the heart failure population in a subsequent study.

Given the substantial disease burden of heart failure, CMS recently developed relevant performance measures pertaining to the treatment of heart failure. For example, the consumer-oriented website Hospital Compare (created by CMS) and the Hospital Quality Alliance offer public access to information about the quality of care in more than 4000 Medicare-certified US hospitals. In 2005, CMS published its first set of 10 core process measures, including those related to heart failure, on the Hospital Compare website. These measures were expanded in 2008 to include hospital 30-day mortality...
rates for heart failure and were further expanded in 2010 to include 30-day all-cause readmission rates after admission for heart failure.10

Other CMS efforts represent a substantial investment in improving the management of patients with heart failure during admission and readmission. In 2012, CMS implemented the Hospital Readmissions Reduction Program (HRRP), an initiative under which hospitals are penalized financially for excessive readmissions; heart failure is 1 of the 5 applicable conditions included since inception of the program.11

In the first year of HRRP, the aggregate penalty was approximately $280 million in Medicare payments distributed across 2200 hospitals, and approximately 30% of hospitals received no penalty.12 For the second year of HRRP, CMS estimates that penalties will amount to approximately $227 million distributed across 2225 hospitals and that, again, approximately 30% of hospitals will receive no penalty.11 In year 3 of HRRP, more hospitals will be penalized (78% of all hospitals nationally), and the total penalties will amount to approximately $428 million.13

Since the program was introduced, the risk-standardized median unplanned readmission rates reported by CMS showed a decline between 2009 and 2012 (ie, decreasing from 23.3% in 2009-2010 to 22.5% in 2011-2012).14 Nonetheless, there was wide variation in hospital performance throughout the United States, with outcome rates for patients with heart failure (such as risk-standardized mortality following hospitalization for heart failure) being at least 4 absolute percentage points lower in the best-performing (90th percentile) hospitals than in the worst-performing (10th percentile) hospitals.14

Another CMS program, the Medicare Spending Per Beneficiary (MSPB) initiative, also has implications for heart failure readmissions. First implemented in fiscal year 2015, MSPB penalizes hospitals where the costs for discharged patients with Medicare incurred in the period from 3 days before admission through 30 days after discharge exceed an aggregate threshold target cost, which is assessed annually for all admissions.15 Because a substantial portion of Medicare admissions are for beneficiaries with heart failure, hospitals have an incentive to more aggressively manage the post–acute care of these beneficiaries, with a focus on reducing readmissions. Some hospitals are attempting to manage this post–acute care independently, whereas others are relying on outside care management firms.

Two additional CMS programs, the Bundled Payments for Care Improvement (BPCI) program and the Medicare Shared Savings Program (MSSP), have the potential to focus efforts on reducing admissions and readmissions for beneficiaries with heart failure. BPCI, which was launched in early 2013, provides a bundled payment for the care of patients with heart failure. The episode-of-care payment strategy under BPCI includes admission to a hospital for a heart failure MS-DRG, as well as services rendered in the period after discharge, extending for up to 90 days. Based on our unpublished analysis of Medicare BPCI claims data, we believe the opportunity to reduce Medicare expenditures in that period is largely derived from reducing hospital readmissions and admissions to skilled nursing facilities in the 30 days after discharge.

The voluntary MSSP initiative offers physician and hospital groups an opportunity to form accountable care organizations (ACOs) that can share in savings from managing their attributed Medicare population’s total cost of care. If an ACO is successful in delivering high-quality care and spending healthcare dollars more efficiently, it is eligible to receive some of the cost-savings. As of January 1, 2015, enrollment in the MSSP included 405 unique organizations, with approximately 15% of the total Medicare population attributed to a MSSP ACO.16

Three of the ACO quality metrics that determine whether savings will be shared with an organization are related to heart failure—ambulatory sensitive admissions for heart failure (ACO-10), beta-blocker therapy for left-ventricular dysfunction (ACO-31), and all-cause unplanned admissions for patients with heart failure (ACO-37).16

Limitations
We acknowledge several study limitations. First, the identification of heart failure in claims data was based on the accuracy of claims coding. Because of this, our study did not capture patients with heart failure who have not had claims coded with a heart failure ICD-9 diagnosis code.

Second, it is possible that patients with low-severity heart failure did not have any claims with a heart failure ICD-9 code in the analysis year 2012. Therefore, it is possible that our definition of the heart failure population caused us to systematically miss individuals who had less severe disease or were subject to less medical intervention (and thus did not have the diagnosis coding required for study inclusion). We also did not include pharmacy claims data, and, as such, we may have missed patients who were effectively managed on heart failure medication. This could mean that our results are skewed toward the higher-cost patients with heart failure.

Third, our findings reflect 2012 experience only; studies of more recent periods may produce different results.

Fourth, our utilization and cost data are based on the Medicare FFS population and may not reflect the experience of Medicare Advantage populations. These results do not apply to commercial or Medicaid populations. However, our goal was to analyze detailed claims information for the Medicare FFS population and, as such, we believe that the results are useful, regardless of this limitation.
Fifth, we required all Medicare members in our analysis to have coverage eligibility in all months of 2011, which eliminated the Medicare members who enrolled in 2012 analysis year, thereby resulting in a slightly older population than the general Medicare population. Because Medicare eligibility begins at age 65 years for most individuals, the generalizability of our findings may be reduced for individuals aged <66 years.

Finally, the outcomes that are reported are national averages; however, the prevalence of heart failure varies regionally. Therefore, region-specific studies would yield different cost contributions to total Medicare population spending. Practice patterns and community infrastructure also vary by region and would be associated with different rates of inpatient admission, readmission, and admission to skilled nursing facilities. Therefore, our results should be interpreted with caution if applied to a particular region of the country.

Conclusions

The findings from our claims-based analysis support those of earlier studies showing that heart failure is associated with high inpatient utilization and costs. The medical and financial burden of Medicare beneficiaries with heart failure is far greater than may be expected from the 11% prevalence of heart failure; based on our study, patients with heart failure account for 41.5% of all inpatient admissions, 55.3% of all readmissions, and 49.5% of admissions to skilled nursing facilities of the total Medicare FFS population. In recent years, CMS implemented programs to improve the management of heart failure to reduce inpatient utilization and cost. Collectively, CMS efforts represent an important investment toward the delivery of high-quality care for patients with heart failure. Although the full value of these newly implemented programs is not yet known, it is clear that the management of Medicare beneficiaries with heart failure needs to be a continuing priority given the increase in prevalence, the minimal improvement in survival rates to date, and the current payment reform climate.

Much can be done in the short-term to further improve the management of heart failure, such as addressing the geographic variation in the utilization of medical services among Medicare beneficiaries with heart failure. Because a substantial portion of Medicare admissions are for beneficiaries with heart failure, it would be reasonable for hospitals to more aggressively manage the post–acute care of these beneficiaries, with a focus on reducing readmissions. The current findings highlight the high service utilization and cost among the heart failure population that point to potentially high-value targets for both payers and providers.

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References


Stakeholder Perspective next page
Validating the Impact of Heart Failure Through the Law of Large Numbers

By Albert Tzeel, MD, MHSA, FAAPL
Regional Medical Director, Senior Products, North Florida, Humana, Jacksonville, FL

Many people are familiar with the quote that is attributed erroneously either to Benjamin Disraeli or to Mark Twain, “There are 3 kinds of lies in the world: lies, damned lies, and statistics.” We know that numbers can be manipulated, data can be tortured, and statistics can be tweaked to help make one’s case; it is for such reasons that many people view statistics with disdain and mistrust. However, to truly understand statistics is to understand that, generally, a smaller sample is taken from a broader population with the goal of inference toward that broader population. Achieving that inference leads to a need for hypotheses, appropriate testing methods, power, and P values.

However, there are other times that different individuals see the same events occurring within their unique populations such that each person believes that what he or she is seeing within the population must indeed be true for others. But does each individual know that to be a fact? Yes, it is fact if one has supporting evidence for his or her case. With this, let’s address inpatient utilization and costs for Medicare members with heart failure.

PATIENTS: In this issue of American Health & Drug Benefits, Fitch and colleagues review in their article the impact of heart failure on the 2012 Medicare fee-for-service population using data provided by the Centers for Medicare & Medicaid Services.¹ The key part of their research is that it is based on a very large and geographically broad data set to assess what the impact is for Medicare beneficiaries with heart failure compared with Medicare members without this condition. In doing so, they compare a data set composed of more than 1.3 million Medicare beneficiaries, of whom 11% had heart failure. This is an extremely large sample and, therefore, it yields what could be considered “real”; it is an example of the law of large numbers at work.

PAYERS: Any payers who work with Medicare Advantage members know that heart failure presents a huge financial and quality-of-life burden for the health plan and for its members. Although all health plan analysts use their own claims data to represent their own little “slice of the world,” it is nice to see those data validated and, perhaps even more important, benchmarked to provide comparative data that will help payers create new and innovative programs to address this significant condition.

PROVIDERS: As physicians increasingly enter into value-based arrangements with payers or are simply willing to accept risk for their population of members through accountable care organizations, they need to know what the population health statistics for heart failure mean for them, and for the success of their practices. Articles such as the current study by Fitch and colleagues provide validation for these efforts and represent a good start.

If we don’t look to the larger data for validation of what we see, we will miss out. As the physicist Sheldon Cooper, a character played by Jim Parsons in the television comedy The Big Bang Theory, once said, “Oh, well, this would be one of those circumstances that people unfamiliar with the law of large numbers would call a coincidence.”²