Older adult visits to the emergency department for ambulatory care sensitive conditions

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Abstract

Objectives: Ambulatory-care-sensitive conditions (ACSCs) represent emergency department (ED) visits and hospital admissions that might have been avoided through earlier primary care intervention. We characterize the current frequency and cost of ACSCs among older adults (≥65 years of age) in the ED.

Methods: This study is a retrospective analysis of Centers for Medicare and Medicaid Services (CMS) national claims data distributed by the Research Data Assistance Center, a CMS contractor based at the University of Minnesota. We analyzed outpatient ED-based national claims data for visits made by traditional fee-for-service (FFS) Medicare beneficiaries in 2016. ACSCs were identified according to the Agency for Healthcare Research and Quality’s Prevention Quality Indicators criteria, which require that the ACSC be the primary diagnosis for the visit. Analysis was done in Alteryx and R.

Results: We documented nearly 1.8 million ACSC ED visits in 2016, finding that ≈10.6% of all ED visits by older adult FFS Medicare beneficiaries were associated with an ACSC. ACSC ED visits resulted in admission more often (39.7%) than non-ACSC ED visits (23.9%). Notably, 83% of patients with short-term complications from diabetes were admitted.

Conclusions: ED visits for a primary diagnosis of an ACSC highlight opportunities to improve access to preventive care, particularly earlier recognition and treatment of patients’ deteriorating conditions that could have potentially precluded the need for the ED visit. An opportunity exists to leverage ED-based initiatives during an ACSC ED visit to support appropriate community and care transitions of these high-risk patients.

KEYWORDS
Ambulatory Care Sensitive Conditions, Emergency Department, Older Adults, Prevention Quality Indicators

1 | BACKGROUND

Ambulatory-care sensitive conditions (ACSCs) represent emergency department visits and hospital admissions that might have been avoided through earlier primary care intervention. Previous research has found that over 15% of ED visits made by older adults are for ACSCs, nearly double the overall rate across all ages.¹ Notably, ACSC-related ED visits exhibit a much higher rate of hospital admission (34.4% compared to 14.0% for non-ACSC ED visits among adults aged 18 and over).¹ Potentially avoidable ED visits are of concern as...
ED visits (and subsequent hospital admissions) have been associated with poor health outcomes, such as loss of mobility, function, and independence. Furthermore, unnecessary utilization of these health care services is indicative of inadequate preventive care and inefficient use of high-cost resources. Compared to an outpatient ACSC visit, payments for an ACSC ED visit have been reported to be 2.5 times higher, and payments for an ACSC admission are 12.7 times higher than an outpatient ACSC visit.

Although the scope of potentially avoidable ED visits among older adults and subsequent hospital admissions have been previously reported among individual institutions and specific geographic regions, reports focusing on the burden of potentially preventable ED visits and hospital admissions at a national level are few, rely on outdated data, and do not follow the current version of standardized methodology developed by the Agency for Healthcare Research and Quality (AHRQ). To understand the current burden, we identified and analyzed national claims data for ED visits by older adults determined to be for potentially preventable conditions using the criteria defined by AHRQ’s Prevention Quality Indicators (PQIs). Analyses of potentially preventable conditions in health services research using previous versions of these criteria have been well documented.

2 METHODS

2.1 Data source

This study is a retrospective analysis of Centers for Medicare and Medicaid Services (CMS) national claims data distributed by the Research Data Assistance Center, a CMS contractor based at the University of Minnesota. We analyzed outpatient ED-based claims data from the 2016 Limited Data Sets, which includes claims data from all beneficiaries enrolled in traditional Medicare plans (ie, Part A and Part B).

2.2 Inclusion and exclusion criteria

We compared 2 groups: ED visits associated with an ACSC as the primary diagnosis and ED visits not associated with an ACSC as the primary diagnosis. For the ACSC cohort, we identified all ED visits that had a primary International Classification of Diseases 10th edition (ICD-10) diagnosis of specific conditions associated with potentially preventable ED visits using criteria defined by AHRQ’s PQIs. As the purpose of this study was to describe the total burden of potentially preventable ED visits among older adults, repeat visits by Medicare beneficiaries were included in both cohorts.

Given the exclusive focus of this analysis on older adults, claims for beneficiaries under 65 years of age were excluded, as was the PQI condition “Asthma in Younger Adults.” Furthermore, in order to fully track post-visit utilization and cost patterns, both cohorts excluded a small proportion (<2%) of claims associated with beneficiaries that lacked continuous fee-for-service (FFS) eligibility over the entirety of the study period.

2.3 Statistical methods

We determined the visit frequency and proportions for all PQI-defined conditions separately and in total. For each PQI-defined condition, we examined the financial impact of these visits by comparing the weighted average payments made by Medicare, the beneficiary, and any supplemental coverage; this amounted to the total average payment. We determined weighted average payment by calculating the sum of the payments made by Medicare, the beneficiary, and supplemental coverage. The average payment was then weighted based on the total population of beneficiaries with the given ACSC. Cohort construction was done in Alteryx and analyses were conducted in R.

3 RESULTS

In 2016, there were nearly 1.8 million potentially preventable ED visits involving older adults, based on AHRQ criteria, accounting for 10.6% of all ED visits among continuous FFS Medicare beneficiaries. The average Charlson comorbidity index score was notably higher among ACSC ED encounters (2.6) compared to non-ACSC ED encounters (1.5) (Table 1). Just over half (52.7%) of the ACSC ED visits were for chronic conditions, and just under half (47.3%) were for acute conditions. The most common ACSC was urinary tract infection, making up 31.6% of all ED visits among continuous FFS Medicare beneficiaries. The average Charlson comorbidity index score was notably higher among ACSC ED encounters (2.6) compared to non-ACSC ED encounters (1.5) (Table 1). Just over half (52.7%) of the ACSC ED visits were for chronic conditions, and just under half (47.3%) were for acute conditions. The most common ACSC was urinary tract infection, making up 31.6% of all ED visits among continuous FFS Medicare beneficiaries.

Notably, 83% of patients with short-term complications from diabetes were admitted. Overall, 39.7% of ED visits for an ACSC (709,950 visits) resulted in a hospital admission, which was notably higher than the proportion of non-ACSC ED visits that resulted in admission (23.9%, Table 1). Interestingly, ED visits for chronic ACSCs were more likely to result in admission compared to acute ACSCs (52.7% and 47.3%, respectively). Notably, 83% of patients with short-term complications from diabetes were admitted.

The weighted total average payment for an ACSC ED visit was $937, the majority of which ($653) was paid by Medicare, with most of the remainder ($270 on average) paid by the beneficiary (Table 2). The weighted average total payments for chronic and acute ACSC ED visits were similar, whereas the weighted average total payments associated with a chronic ACSC visit resulting in admission ($9,886) was higher than the total payment associated with an acute ACSC admission ($7,599, Table 2).
### TABLE 1  Descriptive demographics

|                      | ACSC 65+                  | No ACSC 65+                 | P value (t test) |
|----------------------|---------------------------|----------------------------|-----------------|
| Total (N, (%))       | 1,789,679 (100)           | 15,118,699 (100)           |                 |
| Age                  | –                         | –                          | 0.722           |
| 65-74 years          | 699,764 (39.1)            | 6,759,865 (44.6)           |                 |
| 75-84 years          | 647,863 (36.2)            | 4,981,637 (32.8)           |                 |
| 85+ years            | 442,052 (24.7)            | 3,428,739 (22.6)           |                 |
| Mean age (SD age)    | 77.7 (± 6.12)             | 74.1 (± 5.77)              |                 |
| Race                 | –                         | –                          | 0.003           |
| White                | 1,483,643 (82.9)          | 12,578,621 (82.9)          |                 |
| Black                | 204,023 (11.4)            | 1,668,037 (11.0)           |                 |
| Asian                | 23,278 (1.3)              | 210,255 (1.4)              |                 |
| Hispanic             | 35,793 (2.0)              | 274,326 (1.8)              |                 |
| Native American      | 10,738 (0.6)              | 94,352 (0.6)               |                 |
| Other                | 21,476 (1.2)              | 200,466 (1.3)              |                 |
| Unknown              | 10,728 (0.6)              | 144,184 (1.0)              |                 |
| Sex                  | –                         | –                          | 0.022           |
| Female               | 1,113,180 (62.2)          | 9,770,927 (64.4)           |                 |
| Male                 | 676,499 (37.8)            | 6,144,958 (40.5)           |                 |
| Geographic region    | –                         | –                          |                 |
| Northeast            | 429,522 (24.0)            | 3,717,418 (24.5)           | 0.745           |
| Midwest              | 314,983 (17.6)            | 2,967,868 (19.5)           | 0.009           |
| South                | 660,393 (36.9)            | 4,997,197 (32.9)           | 0.845           |
| West                 | 212,972 (11.9)            | 1,969,912 (13.0)           | 0.019           |
| Other                | 171,809 (9.6)             | 1,527,846 (10.1)           | 0.602           |
| ED to admission      | –                         | –                          |                 |
| Inpatient care       | 709,950 (39.7)            | 3,632,904 (23.9)           | 0.412           |
| 30-day ED revisits   | –                         | –                          |                 |
| All-cause ED revisits| 516,926 (28.9)            | 4,120,414 (27.1)           | 0.817           |
| Dual eligibility status| –                       | –                          |                 |
| Medicaid             | 402,678 (22.5)            | 3,310,990 (21.8)           | 0.116           |
| Charlson Comorbidity Index (CCI) |             |                             |                 |
| None                 | 318,563 (17.8)            | 5,405,785 (35.6)           | 0.413           |
| One (1)              | 461,737 (25.8)            | 3,850,623 (25.4)           | 0.009           |
| Two (2)              | 302,455.75 (16.9)         | 2,038,790 (13.4)           | 0.987           |
| Three (3)            | 255,924 (14.3)            | 1,658,193 (10.9)           | 0.075           |
| Four (4)             | 130,647 (7.3)             | 1,302,713 (8.6)            | 0.022           |
| Five or more (5+)    | 320,352 (17.9)            | 914,136 (6.0)              | 0.871           |
| Mean CCI score       | 2.6                       | 1.5                        |                 |

ACSC, ambulatory-care-sensitive conditions

The 30-day all-cause ED revisit rate among encounters with an ACSC index visit was 28.9%, compared to 27.1% in the non-ACSC arm (Table 1). There was notable variation between chronic ACSC and acute ACSC all cause 30-day ED revisit rates (32.4% and 25.0%, respectively, Table 3). The 30-day ED revisit rate for the same ACSC as at the index visit was 7.9% and was predictably higher for chronic ACSCs (10.6%) compared to acute ACSCs (4.9%). These differences were largely due to the outsize impact of the chronic ACSC “diabetes with long-term complications,” which had both a high all-cause (59.7%) and same-cause (45.1%) ED revisit rate.

4 | DISCUSSION

Our study found that ≈10.6% of all ED visits made in 2016 by FFS Medicare beneficiaries over the age of 65 were for a
### TABLE 2  Weighted average payments for ACSC ED visits and associated hospital admissions

| Condition                                      | ACSC ED visit | ACSC hospital admissions from the ED |
|------------------------------------------------|---------------|--------------------------------------|
| Total weighted average (all ACSCs)            | Average payment made by Medicare: $653 | Average payment made by Medicare: $7,500 |
| Weighted average for all acute ACSCs           | Average payment made by supplemental coverage: $14 | Average payment made by supplemental coverage: $51 |
| Community-acquired pneumonia (acute ACSC)     | Average payment made by beneficiary: $270 | Average payment made by beneficiary: $1,197 |
| Urinary tract infection (acute ACSC)           | Average payment made by Medicare: $502 | Average payment made by Medicare: $1,293 |
| Weighted average for all chronic ACSCs         | Average payment made by supplemental coverage: $16 | Average payment made by supplemental coverage: $32 |
| Diabetes with short-term complications (chronic ACSC) | Average payment made by beneficiary: $705 | Average payment made by beneficiary: $1,062 |
| Diabetes with long-term complications (chronic ACSC) | Average payment made by Medicare: $478 | Average payment made by Medicare: $360 |
| Chronic obstructive pulmonary disease (chronic ACSC) | Average payment made by supplemental coverage: $9 | Average payment made by supplemental coverage: $129 |
| Hypertension (chronic ACSC)                    | Average payment made by beneficiary: $685 | Average payment made by beneficiary: $940 |
| Heart failure (chronic ACSC)                   | Average payment made by Medicare: $436 | Average payment made by Medicare: $1,252 |

ACSC, ambulatory-care-sensitive conditions
TABLE 3  30 Day ED revisits

| Condition (N, (%))                             | Number of ACSC ED visits 65+ | 30-day ED revisits for the same ACSC condition | All-cause 30-day revisit |
|-----------------------------------------------|------------------------------|-----------------------------------------------|-------------------------|
| Total number of all ACSC claims               | 1,789,679 (100)              | 141,754 (7.9)                                 | 516,926 (28.9)          |
| All Acute ACSCs                               | 846,340 (47.3)               | 41,426 (4.9)                                  | 211,310 (25.0)          |
| Community-acquired pneumonia (acute ACSC)     | 281,408 (15.7)               | 9,170 (3.3)                                   | 63,558 (22.6)           |
| Urinary tract infection (acute ACSC)          | 564,932 (31.6)               | 32,256 (5.7)                                  | 147,752 (26.1)          |
| All Chronic ACSCs                             | 943,339 (52.7)               | 100,328 (10.6)                                | 305,616 (32.4)          |
| Diabetes with short-term complications (chronic ACSC) | 5,863 (0.3)                  | 191 (3.3)                                     | 1,540 (26.3)            |
| Diabetes with long-term complications (chronic ACSC) | 167,029 (9.3)                | 75,412 (45.1)                                 | 99,675 (59.7)           |
| Chronic obstructive pulmonary disease (chronic ACSC) | 77,996 (4.4)                 | 4,861 (6.2)                                   | 18,921 (24.3)           |
| Hypertension (chronic ACSC)                   | 273,522 (15.3)               | 18,353 (6.7)                                  | 60,859 (22.2)           |
| Heart failure (chronic ACSC)                  | 418,929 (23.4)               | 1,511 (0.4)                                   | 124,621 (29.7)          |

ACSC, ambulatory-care-sensitive conditions

Ultimately, expanding patient-centered interventions that improve connections and access to community services and primary care may help reduce potentially avoidable ED visits and hospital admissions among the growing population of older adults.

DATA ACCESSIBILITY STATEMENT
All data used in this study are available through CMS/ResDAC, subject to requirements and a fee.

CONFLICT OF INTEREST
The authors have no conflicts of interest to report.

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