

Changing Diagnosis Patterns Are Increasing Medicare Spending for Inpatient Hospital Services

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Overview

Changes in diagnosis patterns are leading to an increase in Medicare spending for inpatient care. As the charts that follow illustrate, in examining some of the most frequent and fastest-growing episodes, we find high episode growth rates for DRGs (diagnosis-related groups) with higher reimbursement. This implies that overall Medicare spending increases are being driven more by rising volumes of these highly reimbursed services rather than by growth in payments per se. Incentives related to Medicare reimbursement may therefore be spurring changes in medical coding.

KEY FINDINGS

- The frequency of sepsis and severe heart failure has increased, while coding for pneumonia and less severe heart failure has declined.
- These shifts in diagnoses are not the result of demographic changes.
- The increase in the frequency of episodes is higher for those with higher reimbursement, suggesting that payment incentives and coding may be contributing to spending increases.

EXHIBIT 1

Spending increased on episodes triggered by hospitalizations for sepsis and heart failure from 2008 to 2017.

Increase in Medicare spending by condition, 2008–2017 (in \$ millions)

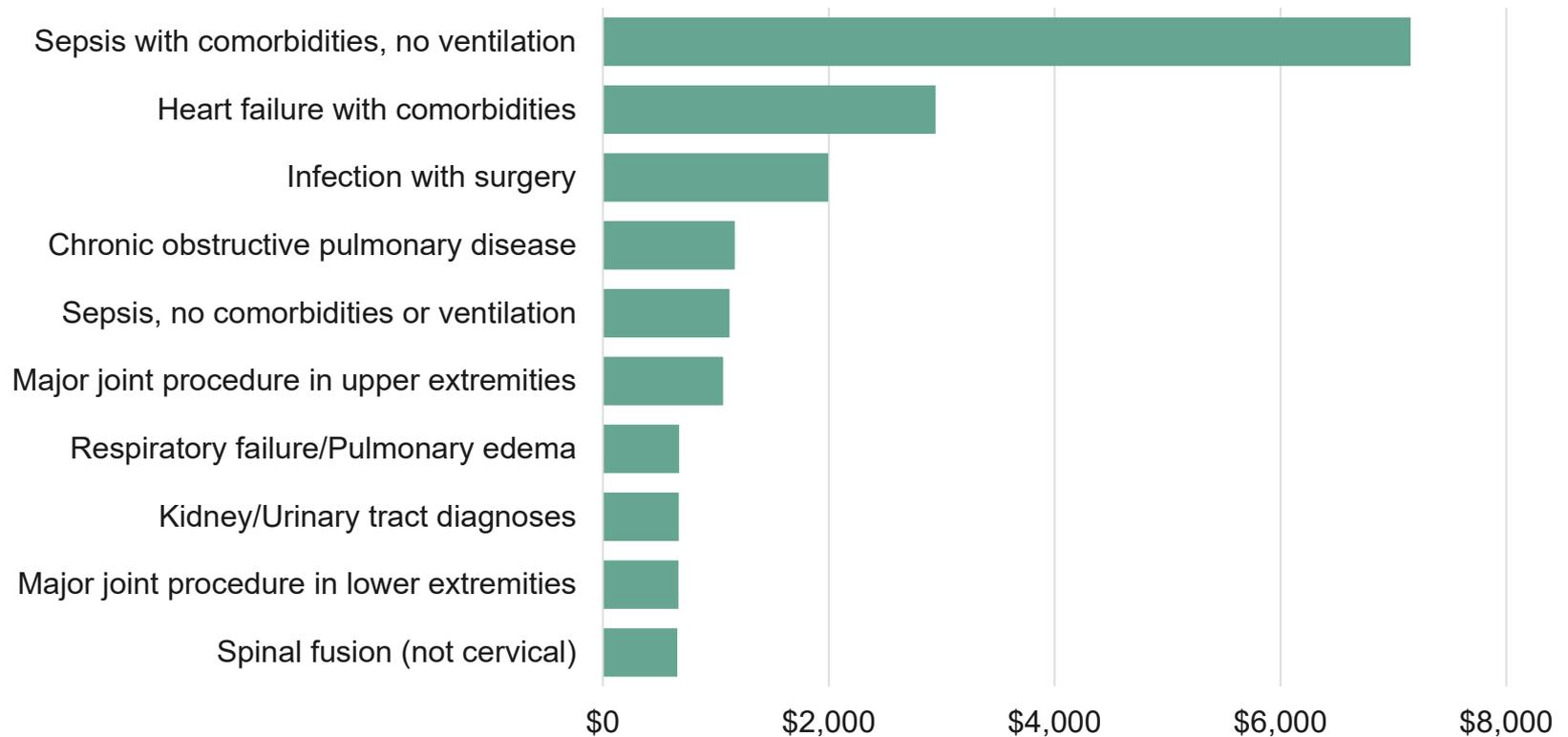
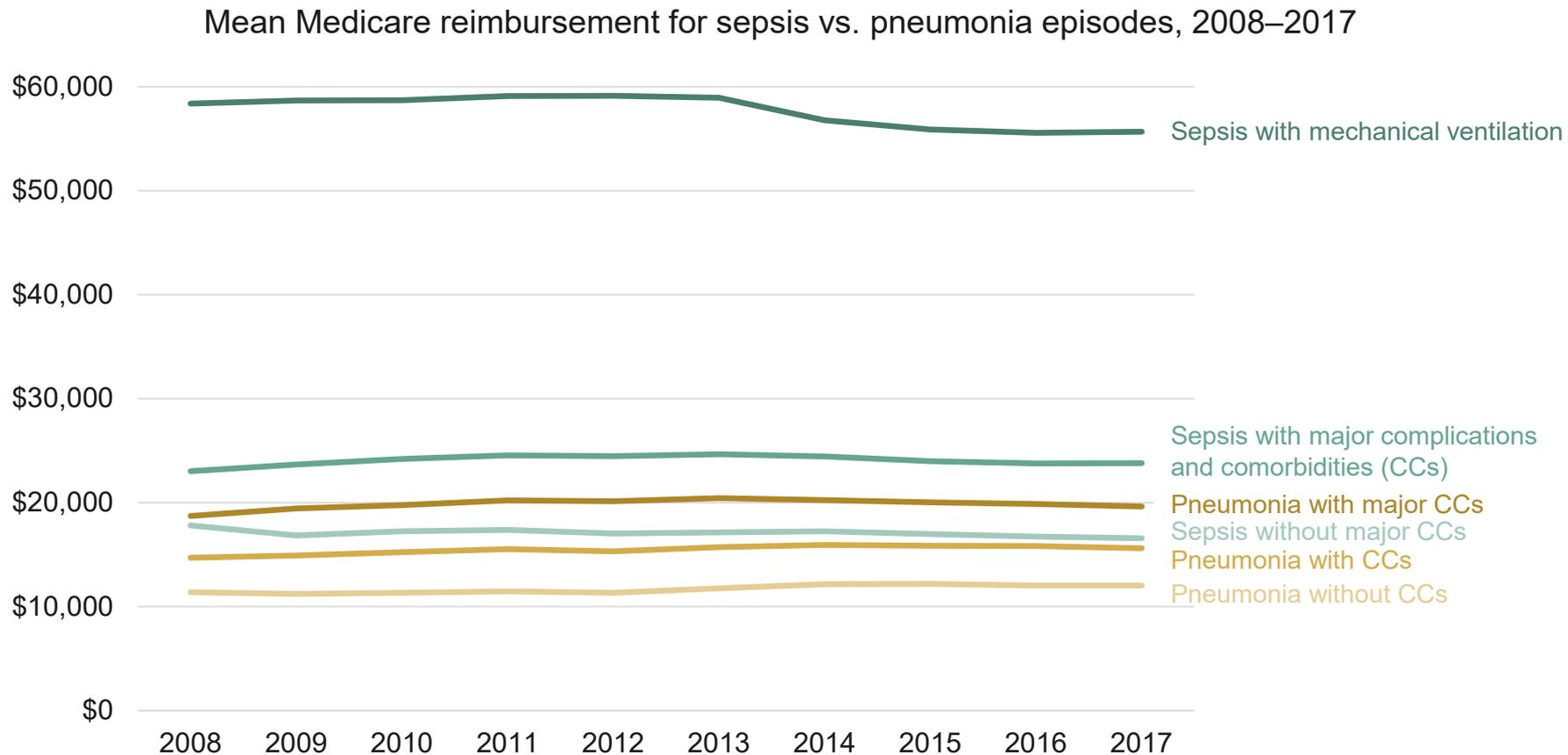


EXHIBIT 2

Sepsis and pneumonia have symptoms in common, but Medicare reimbursement is higher at each level of complication for sepsis. Reimbursement rates have been relatively stable.

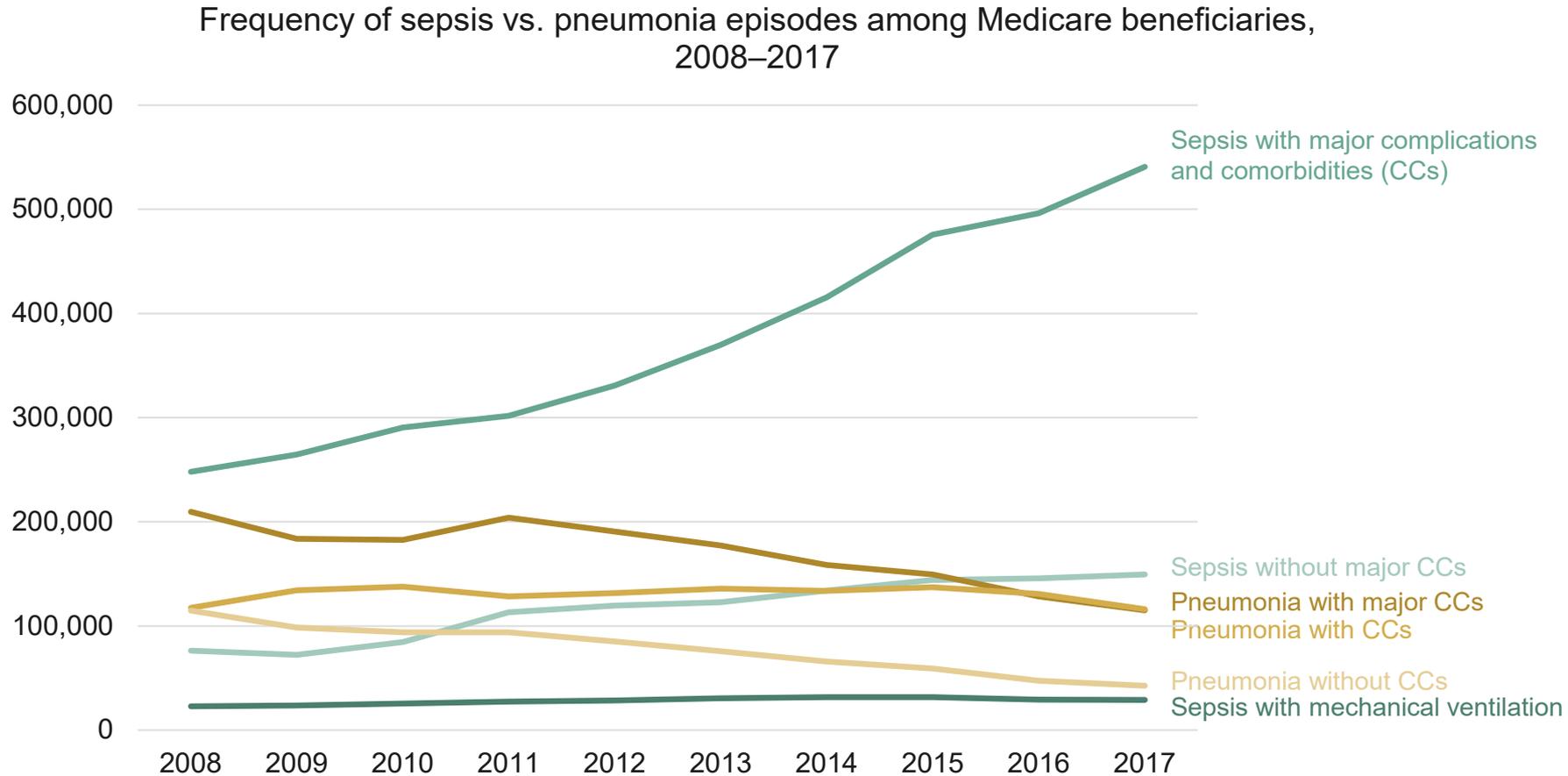


Data: Authors' analyses of Medicare claims data for fee-for-service Medicare beneficiaries age 65 and older, 2008 to 2017.

Notes: The costs of septicemia episodes have increased \$7.453 billion from 2007 to 2018 over nearly 325,000 additional episodes; in contrast, the spending on pneumonia has fallen by \$1.386 billion, with nearly 135,000 fewer episodes over the same time period.

EXHIBIT 3

Episodes of severe sepsis increased dramatically from 2008 to 2017, while pneumonia episodes dropped.



Data: Authors' analyses of Medicare claims data for fee-for-service Medicare beneficiaries age 65 and older, 2008 to 2017.

Notes: While episode-shifting between pneumonia and sepsis is a possible driver of increases in sepsis and declines in pneumonia, it is not the only one. Pneumonia may have declined for other reasons, including increases in pneumococcal immunization rates. We note, however, that episodes for kidney and urinary tract infections, the other leading cause of sepsis, also declined over this period; this trend and the trend in pneumonia both point to a large increase in sepsis not due to these common clinical precursors.

EXHIBIT 4

The number of sepsis cases increased across all Medicare beneficiary ages and races/ethnicities from 2008 to 2017.

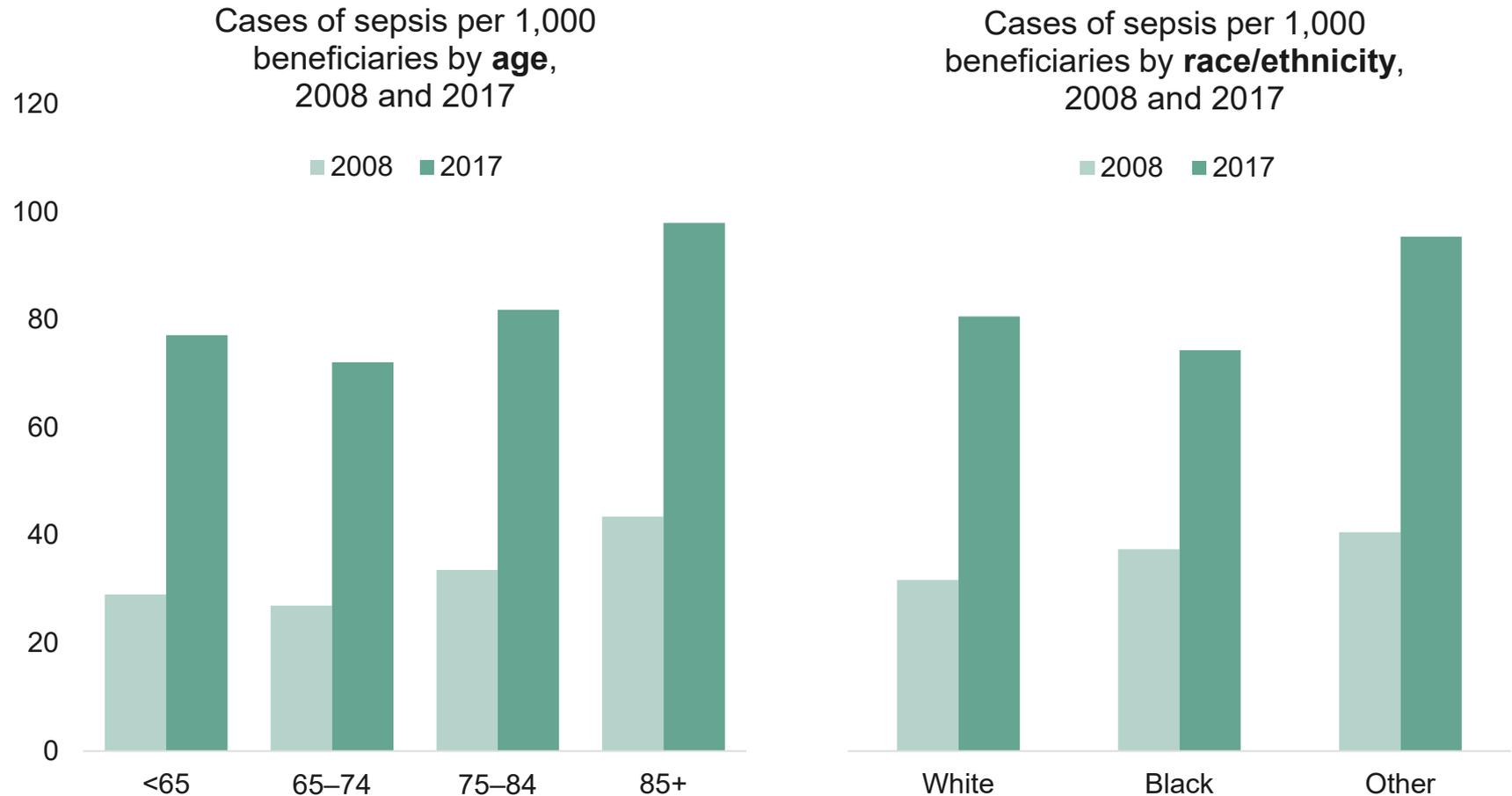
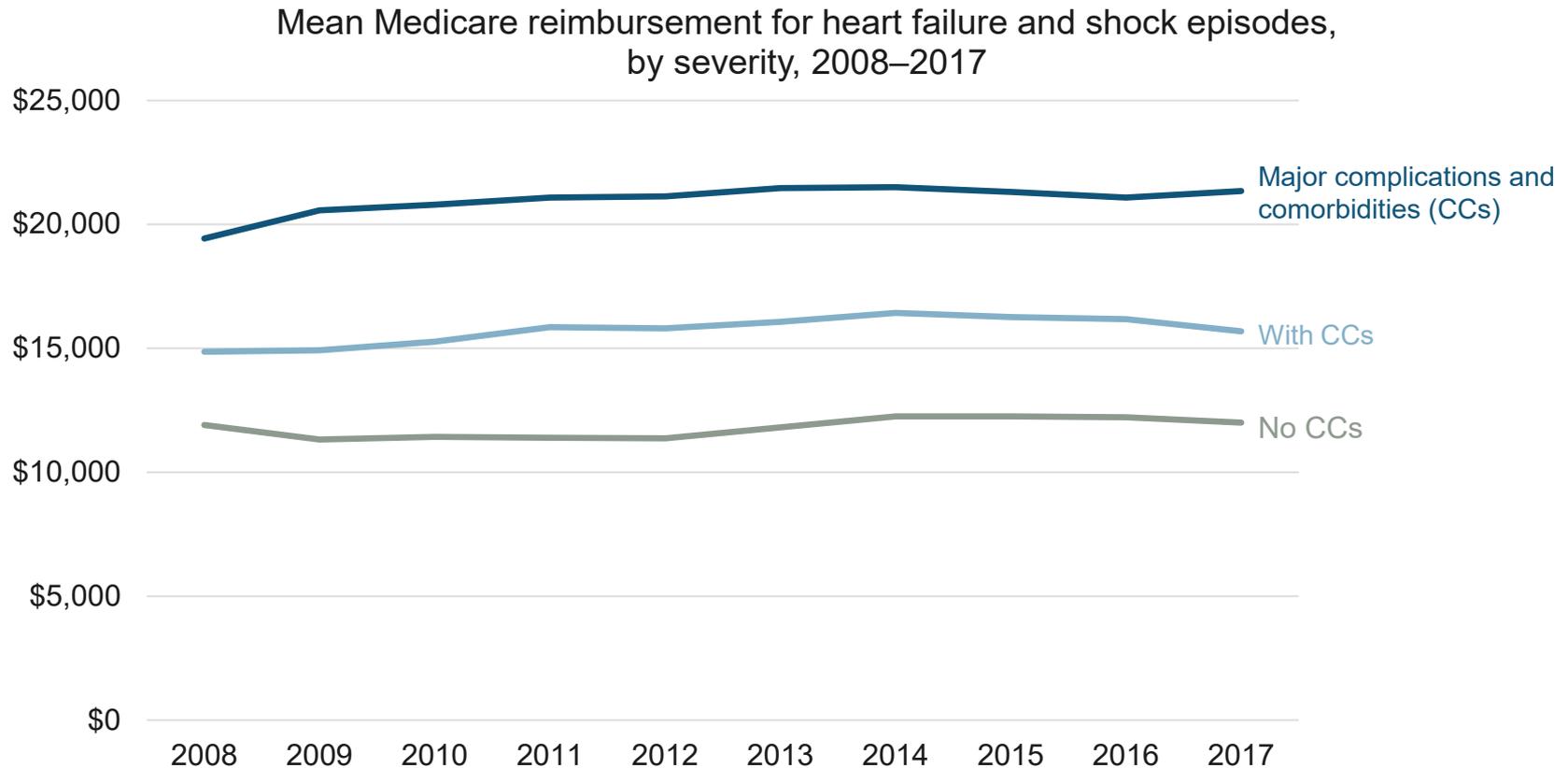


EXHIBIT 5

Medicare reimbursement is higher for more complex heart failure and shock episodes and reimbursement rates have been relatively stable.

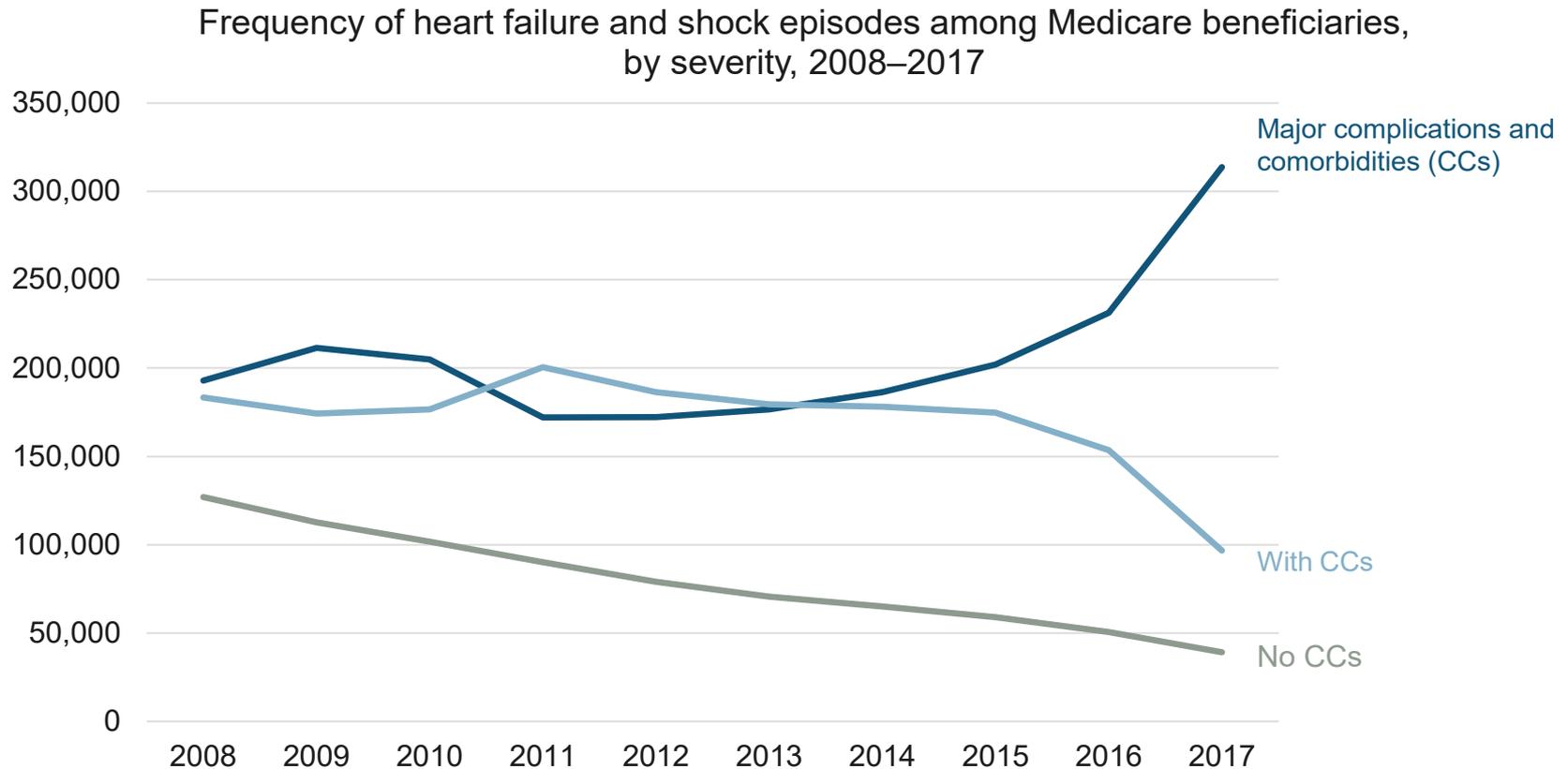


Data: Authors' analyses of Medicare claims data for fee-for-service Medicare beneficiaries age 65 and older, 2008 to 2017.

Notes: Frequency changes across the three heart failure DRGs have been the main drivers behind total cost changes. The "Heart failure with major complications and comorbidities" DRG showed an absolute increase of 120,751 episodes and \$2.945 billion, while the other two DRGs decreased in frequency and cost by a combined 174,488 episodes and \$2.250 billion. This has led to an increase of costs of \$695 million, even as the number of heart failure episodes fell by 53,737 from 2007 to 2018.

EXHIBIT 6

Since 2011, episodes of the most severe and expensive type of heart failure increased, while episodes of less expensive, less severe heart failure declined; coding changes in 2015 exacerbated these trends.

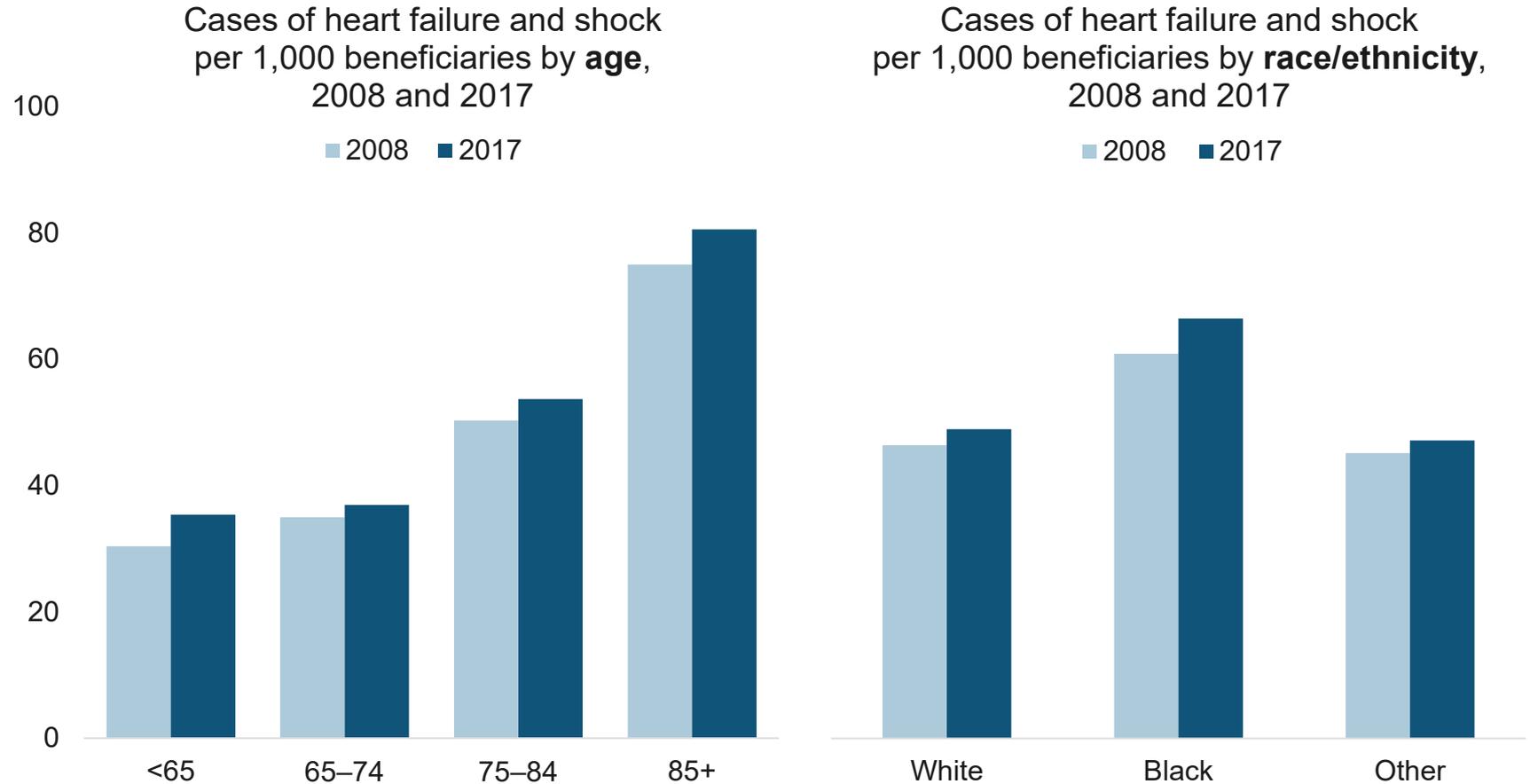


Data: Authors' analyses of Medicare claims data for fee-for-service Medicare beneficiaries age 65 and older, 2008 to 2017.

Notes: Frequency changes across the three heart failure DRGs have been the main drivers behind total cost changes. The "Heart failure with major complications and comorbidities" DRG showed an absolute increase of 120,751 episodes and \$2.945 billion, while the other two DRGs decreased in frequency and cost by a combined 174,488 episodes and \$2.250 billion. This has led to an increase of costs of \$695 million, even as the number of heart failure episodes fell by 53,737 from 2007 to 2018.

EXHIBIT 7

Heart failure and shock increased across all ages and races/ethnicities, with Black Medicare beneficiaries seeing both a higher prevalence and greater increases than other groups.



Methodological Notes

- **Motivation:** We sought to examine the rise in Medicare spending for inpatient services given the decline in overall inpatient utilization. Sepsis and heart failure were chosen because they were included in the diagnosis-related groups (DRGs) with the largest absolute increase in episode spending from 2008 to 2017.
- **Definitions:** We defined an inpatient episode to include the following services and spending: total traditional Medicare spending for care in the 30 days leading up to an acute hospital admission, the duration of the hospitalization, and the 90 days post hospital discharge. To measure episode-related spending for hospitalizations that occurred during the calendar years 2008–2017, we analyzed 2007–2018 Medicare Part A, B, and D claims data and Minimum Data Set records for beneficiaries living in the 50 states and Washington, D.C. Beneficiaries needed to have traditional Medicare Part A and B for the entire length of the episode to be included in the study. Spending for beneficiaries who died during the episode window had spending measured until death. If the start date of a claim fell within the episode window, then that claim was attributed to an episode. All acute hospitalizations initiated a new episode, unless the hospitalization was a readmission within 90 days for the same DRG as the beneficiary's previous hospitalization. Nonacute hospitalizations in inpatient rehabilitation facilities, psychiatric facilities, and other long-term settings did not trigger new episodes. Since almost every hospitalization was considered the start of a new episode, beneficiaries could have overlapping episodes. To avoid double-counting spending for concurrent episodes, we weighted spending proportionately during the overlapping periods. For example, if a new episode began a month before a prior episode ended, then the spending for the overlapping month was weighted so that half of the spending was attributed to the earlier episode and half was attributed to the later episode. Up to three overlapping episode windows were accounted for in our approach. Fewer than 6 percent of index hospitalizations had four or more overlapping episodes. In this situation, all spending for overlapping time was attributed to the third episode.
- In slides where it is applicable, the race of beneficiaries was determined using the RTI race variable, which uses an algorithm developed by the Research Triangle Institute to more accurately capture minority groups. The “Other” variable, in these slides, is a combination of RTI race variables for “Hispanic” and “Other.”
- **Limitations:** Results may not be generalizable to other populations, including Medicare Advantage beneficiaries. While our results suggest “upcoding” may be occurring, further studies using clinical data and/or using a comparison group would be necessary to attribute the change definitively to coding behavior.