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DATA BRIEF

November 2026 | OEI-02-24-00230

Medicare Could Put Billions of Dollars To Better Use by Adjusting Hospital Payments To Be Consistent with the Updated Definition of Sepsis

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Why OIG Did This Review

- Sepsis is the body's extreme response to an infection that requires treatment. OIG, CMS, and the Department of Justice have had longstanding concerns about the potential for hospitals' overuse of sepsis in billing.
- Medicare uses a broad definition of sepsis that was developed in 1991. Under this definition, a fever and elevated heart rate with an infection can be considered sepsis.
- Medicare typically pays hospitals more for stays billed with a sepsis diagnosis as opposed to other diagnoses for infections, such as pneumonia.
- The definition of sepsis was updated by experts in 2016 to better differentiate sepsis from uncomplicated, more general infections. This more precise definition includes the element of organ dysfunction and is widely accepted by numerous medical organizations both within the United States and internationally.
- However, Medicare still uses the older, broad definition for billing and payment purposes.

What OIG Found

Hospitals included a sepsis diagnosis in about **1 in 10 inpatient stays** that they billed in FY 2024 under the broad definition that Medicare uses.

Medicare **could have put an estimated $2.2 billion to better use** in FY 2024 had hospital payments been consistent with the updated definition of sepsis.

Billing for sepsis stays varied widely among hospitals, **raising concerns that some may be leveraging the broad definition to maximize their Medicare payments**.

What OIG Recommends

1. CMS should adjust hospital payments to reduce the financial incentive to bill sepsis stays.
2. CMS should use its monitoring of hospitals' billing for sepsis stays to take appropriate follow-up actions.

CMS neither concurred nor nonconcurred with our two recommendations and asked that they be removed. OIG maintains the importance of both recommendations for reducing the incentive for hospitals to bill sepsis stays to maximize Medicare payments. OIG did not remove the recommendations.

PRIMER: Medicare Payments for Inpatient Hospital Stays and Sepsis

How Medicare pays for inpatient hospital stays

- Each inpatient hospital stay is assigned to a Medicare Severity Diagnosis Related Group (MS-DRG). These groups are based on the patient's principal diagnosis, any secondary diagnoses, the procedures the hospital performed, and other factors such as age and sex. There were 766 MS-DRGs in FY 2024.
- Most MS-DRGs have two components:
  - the base DRG, which is the primary reason a patient requires a hospital stay and often based on the principal diagnosis, and
  - the severity level (high, medium, or low), which accounts for any secondary diagnoses that are considered complications or comorbidities.
- Medicare pays hospitals a different payment rate for each MS-DRG. These payment rates are set prospectively to reflect the average resources expected to be used to care for a patient in that MS-DRG.

Sepsis

- Sepsis is the body's extreme response to an infection that requires treatment.[1]
- Medicare pays more for hospital stays billed with sepsis as a principal or secondary diagnosis.
- Currently, hospitals can bill for inpatient stays with sepsis, severe sepsis, and septic shock diagnoses (see Appendix A for the list of associated diagnosis codes). This report focuses on sepsis, meaning the patient was diagnosed with sepsis but not with severe sepsis or septic shock. We refer to this subset as "sepsis stays."
- Medicare uses a broad definition of sepsis, developed in 1991, for billing and payment purposes. Under this definition, a fever and elevated heart rate with an infection can be considered sepsis.
- The definition of sepsis was updated by experts in 2016 to better differentiate it from uncomplicated, more general infections. This more precise definition—referred to as "Sepsis-3"—includes organ dysfunction, which is not included in the broad, older definition Medicare uses.

	Broad definition: used by Medicare for billing	Updated definition: Sepsis-3 (developed in 2016)
Sepsis	Systemic Inflammatory Response Syndrome (SIRS) with a documented infection; the criteria for SIRS are two or more of the following symptoms: • Temperature of more than 100.4 or less than 96.8 degrees Fahrenheit, • a heart rate of more than 90/minute, • hyperventilation (respiratory rate >20/min or $PaCO_2$<32mm Hg), • or a high (>12,000/mm^3) or low (<4,000/mm^3) white blood cell count or >10% immature bands	Life-threatening **organ dysfunction** caused by a dysregulated host response to infection
Severe sepsis	Sepsis plus organ dysfunction, hypoperfusion, or hypotension	N/A
Septic shock	Sepsis-induced hypotension persisting despite adequate fluid resuscitation	Subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality

Source: Mervyn Singer, Clifford S. Deutschman, Christopher Warren Seymour, et al., "The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)," *JAMA*, vol. 315, no. 8 (February 23, 2016), pp. 801-810. doi:10.1001/jama.2016.0287. Available at https://jamanetwork.com/journals/jama/fullarticle/2492881. Accessed on September 15, 2025.

- The broad definition is represented in the diagnosis codes, referred to as ICD-10-CM, that Medicare uses for billing and payment. These codes are managed by the ICD-10 Coordination and Maintenance Committee, which is co-chaired by CMS and the Centers for Disease Control and Prevention (CDC). This Committee has not adopted the updated definition, though it has been adopted by others, such as insurers and some government programs.

PRIMER: Methodology

We based this data brief on an analysis of paid Medicare fee-for-service claims from the National Claims History File with dates of service in FY 2024. We excluded claims from hospitals that were not paid under the Inpatient Prospective Payment System (IPPS), such as long-term care hospitals, critical access hospitals, and hospitals in Maryland.

Identification of stays billed under the broad definition

This review focuses on hospital inpatient stays in which the Medicare patient was diagnosed with sepsis that met the broad definition, but would not have been consistent with the updated definition had it been in use.

These stays were billed with a diagnosis of sepsis, but without a diagnosis of severe sepsis or septic shock. Claims that included severe sepsis or septic shock would have been consistent with the updated definition because they indicate that the patient had a more severe condition that involved organ dysfunction.[2] These claims that included severe sepsis or septic shock are not the focus of this review.

Estimate of funds that could be put to better use

We developed a model to determine whether the claims for sepsis stays would have been assigned to an alternative MS-DRG if the updated definition of sepsis were used. Specifically, we removed the sepsis diagnosis from the claim and determined whether the claim would have been assigned to an alternative MS-DRG in this model scenario. The model reassigned the original MS-DRG for each stay to either a different base DRG, such as the DRG for the underlying infection, or to the same base DRG but at a lower severity level based on other included diagnoses. We then estimated a new payment amount for each claim using a ratio of the relative weights associated with the original MS-DRG and the alternative MS-DRG. CMS publishes the relative weight associated with each MS-DRG annually; it represents the average resources required to care for a patient in that particular MS-DRG.

We also assessed billing variation among hospitals for these stays that met the broad definition but would not have been consistent with the updated definition. We assessed variations in length of stay and of the amount of high severity stays.

Please see the Detailed Methodology on page 9 for additional information about the model and other analytic decisions.

Limitations

This study is based on an analysis of claims data. The model we developed estimates the funds that could be put to better use (i.e., the difference in hospital payments associated with the updated definition of sepsis). The model assumes the accuracy of the information submitted by hospitals (i.e., that a severe sepsis diagnosis code was submitted when organ dysfunction was present and was not submitted when organ dysfunction was not present). We did not conduct medical record reviews to verify the presence or absence of organ dysfunction.

FINDINGS

This report focuses on inpatient hospital stays in which the Medicare patient was diagnosed with sepsis but was not diagnosed with severe sepsis or septic shock. We refer to this subset as sepsis stays. These stays were billed under the broad sepsis definition that Medicare uses.

This report does not focus on stays in which the Medicare patient was diagnosed with severe sepsis or septic shock, as these stays would have been consistent with the updated definition of sepsis. See Appendix B for additional information about the frequency of these stays.

Hospitals included a sepsis diagnosis in about 1 in 10 inpatient stays that they billed in FY 2024 under the broad definition that Medicare uses

Hospitals included a sepsis diagnosis in about 1 in 10 Medicare inpatient stays that they billed under the broad definition Medicare uses, for a total of 615,007 stays in FY 2024. This definition was developed 35 years ago and allows for a patient with symptoms of fever and elevated heart rate resulting from an infection to be diagnosed with sepsis. Typically, Medicare payments are greater when a stay includes a sepsis diagnosis than when it does not.

Medicare paid over $12 billion for sepsis stays, at about $20,000 each.[3] See the text box for more information about how a sepsis diagnosis impacts Medicare payment.

A task force of experts from the United States and abroad developed an updated definition for sepsis in 2016. This more precise definition includes the element of organ dysfunction to better differentiate sepsis from uncomplicated general infections.[4] In contrast, Medicare includes organ dysfunction in the definitions of severe sepsis or septic shock, but not sepsis.

Financial incentives for including a sepsis diagnosis when billing Medicare

When sepsis is included as the principal diagnosis, the stay is generally assigned to one of the sepsis MS-DRGs. Medicare typically pays more for these MS-DRGs than other infection-related MS-DRGs.

When sepsis is included as a secondary diagnosis, the stay is typically paid at the high severity level within a base DRG, as most of the sepsis diagnosis codes are major complications. Medicare pays more for high severity level MS-DRGs because the conditions are typically more costly to treat.

The updated definition is commonly used by Federal programs that are designed to improve sepsis care. For example, a CDC program to help hospitals improve sepsis management and

outcomes uses the updated definition, as does CMS in its hospital quality program.[5] Also, some insurance payors, including some Medicare Advantage insurers, use the updated definition of sepsis in determining payment.

The 615,007 sepsis stays billed under the broad definition that Medicare uses would likely not have been billed as such had the updated definition been used instead. That is, the stays would not have included a sepsis diagnosis because, according to the hospital billing, organ dysfunction was not present.

Medicare could have put an estimated $2.2 billion to better use in FY 2024 had hospital payments been consistent with the updated definition of sepsis

Medicare could have put an estimated $2.2 billion to better use in FY 2024 if payments had been consistent with the updated definition of sepsis. These dollars derive from 407,389 sepsis stays in FY 2024 in which the diagnosis of sepsis directly impacted how much Medicare paid for the stay.[6] On average, Medicare paid about $5,000 more for each of these stays for the sepsis diagnosis specifically.

Because these stays did not include a diagnosis of severe sepsis or septic shock, which generally indicates organ dysfunction, they likely would not have been consistent with the updated definition of sepsis. Absent the sepsis diagnosis, the stays would have been paid differently because they likely would have been assigned to a different base DRG or a lower severity level.

Most of the stays (355,004) likely would have been assigned to a different base DRG, such as the DRG for the underlying infection. Most often, these different base DRGs would be related to diagnoses of pneumonia and metabolic encephalopathy. Medicare would have paid $4,405 less for each of these stays on average, amounting to an estimated $1.6 billion overall that could have been put to better use.

The remaining stays (52,385) likely would have been assigned to the same base DRG, but at lower severity levels. At the lower severity levels, Medicare would have paid $11,493 less for each of these stays, on average. This would have amounted to an estimated $602 million overall that could have been put to better use. For these stays, the original sepsis diagnosis was typically the only secondary diagnosis considered a major complication associated with the stay. See Exhibit 1 for examples of how stays would have been paid differently had Medicare payments been consistent with the updated definition of sepsis. See Appendix C for the full titles of all MS-DRGs referenced in this report.

Exhibit 1. An example of how two stays would have been paid differently had Medicare payments been consistent with the updated definition of sepsis

	Medicare payment under broad definition	Estimated payment consistent with updated definition	**Estimated dollars that could have been put to better use**
Stay with a sepsis principal diagnosis	DRG: *Sepsis with MCC*, Payment: **$15,000**	**Different base DRG:** *Pneumonia with MCC*, Payment: **$10,000**	$5,000
Stay with a sepsis secondary diagnosis	DRG: *Other Circulatory System Diagnoses with MCC*, Payment: **$20,600**	**Same base DRG at lower severity level**: *Other Circulatory System Diagnoses with CC*, Payment: **$9,500**	$11,100

Source: OIG data analysis of FY 2024 claims data.

Billing for sepsis stays varied widely among hospitals, raising concerns that some may be leveraging the broad definition to maximize their Medicare payments

There are financial incentives for hospitals to include sepsis on the stays that they bill, as Medicare typically pays more for stays with a sepsis diagnosis. Moreover, the broad definition, which requires only an infection with a fever and elevated heart rate to justify a sepsis diagnosis, makes it possible for hospitals to include a diagnosis of sepsis for a considerable number of the stays that they bill.

Hospitals varied markedly in the frequency with which they billed Medicare for sepsis stays in FY 2024. Nationally, hospitals billed about 1 in 10 inpatient stays with sepsis. But some hospitals billed more than one in five of their Medicare inpatient stays with sepsis while other hospitals billed no sepsis stays at all.

Hospitals also varied in terms of the length of sepsis stays billed. The length of a hospital stay typically corresponds with the seriousness of the patient's condition, with sicker patients staying in the hospital for longer. In FY 2024, some sepsis stays lasted 1 day while others lasted 35 days. Notably, shorter stays lasting 3 or fewer days accounted for 30 percent of all sepsis stays. For some hospitals, these shorter stays made up 75 percent of their sepsis stays while for others, shorter stays accounted for merely 5 percent.

It is important to note that regardless of how many days the patient is in the hospital, stays in a given MS-DRG are paid at the same rate.[7] As a result, shorter stays typically provide a financial advantage to hospitals as opposed to longer stays. For example, hospitals were paid about $16,600 for each stay assigned to MS-DRG 871 whether the patient was in the hospital for 3 days or 2 weeks.

Finally, hospitals varied in terms of the percentage of sepsis stays that were billed at the high severity level. Some hospitals had more than 90 percent of their sepsis stays reach the high severity level, while others had less than half of their sepsis stays at that level. Overall, more than three quarters (78 percent) of sepsis stays were paid at the high severity level in FY 2024, resulting in higher Medicare payments for the hospital. For about a third of these stays, sepsis was the reason that the stay reached the high severity level. Had sepsis not been included for these stays, the portion at the high severity level likely would have dropped to 53 percent.

The variations in billing raise concerns as to whether some hospitals are leveraging the broad definition of sepsis to maximize the payments they receive from Medicare.

CONCLUSION AND RECOMMENDATIONS

We found frequent and varied billing of sepsis stays under the broad definition currently used, resulting in substantial Medicare payments. Medicare could have put an estimated $2.2 billion to better use in FY 2024 had hospital payments been consistent with the updated, more precise definition of sepsis. Together, the broad definition of sepsis that Medicare uses and the financial incentive in Medicare's payment system to bill sepsis stays encourage hospitals to bill sepsis stays in instances of infections with a fever and elevated heart rate. In this way, hospitals are then able to benefit from the higher payments associated with sepsis stays.

Looking forward, there is an opportunity for CMS to reduce the financial incentive to bill sepsis stays, put billions of dollars to better use in the hospital payment system, and achieve consistency in hospitals' billing for inpatient stays with a sepsis diagnosis. Note that the definition of sepsis can be updated in ICD-10 only by the ICD-10 Coordination and Maintenance Committee, which is co-chaired by CDC and CMS. Separate from that issue, our recommendations present ways in which CMS can reduce the financial incentive in the inpatient hospital payment system to bill sepsis stays.

Accordingly, we recommend that CMS:

Adjust hospital payments to reduce the financial incentive to bill sepsis stays

CMS should adjust hospital payments under the Inpatient Prospective Payment System (IPPS) to reduce the financial incentive for hospitals to bill sepsis stays. Medicare's payment system currently does not distinguish among sepsis stays—i.e., those for a fever and elevated heart rate with an underlying infection from those including organ dysfunction. This structure is inconsistent with the updated, more precise definition of sepsis and is associated with an estimated $2.2 billion in Medicare payments annually. Adjusting hospital payments per this recommendation would better distinguish among stays and allow Medicare to more accurately pay for sepsis diagnoses. Ultimately, this better alignment of the payment system would reduce the incentive for hospitals to bill sepsis diagnoses to maximize payments, which would result in an estimated $2.2 billion in funds that could be put to better use.

There are likely multiple ways to implement this recommendation using annual rulemaking. CMS could require a diagnosis of severe sepsis or septic shock for payment under the MS-DRGs 870-872 so that all stays billed to these MS-DRGs align with the updated definition. Stays that are not consistent with the updated definition could either be billed to their infection-related MS-DRGs or to a new group of MS-DRGs that CMS could develop for this purpose. CMS should also reconsider

the role of the sepsis diagnoses that are not severe sepsis or septic shock on the "major complications and comorbidities" list. For example, it could remove them from this list entirely. As a result, stays billed with a secondary diagnosis of sepsis would not be assigned to a high-severity MS-DRG because of that diagnosis. We recognize that this may not be the only approach, and that CMS may want to explore other ways to implement this recommendation.

Changes to MS-DRGs and their relative weights in annual rulemaking must be implemented in a "budget neutral" manner.[8] This means that the $2.2 billion that we identified would remain within the IPPS and could be put to better use via different hospitals and MS-DRGs. CMS could explore avenues within its existing authority or seek statutory authority for these dollars to accrue as savings to taxpayers and the Medicare program more widely. The IPPS includes a provision to adjust for changes in billing that do not reflect real changes in patient characteristics.[9] CMS could explore leveraging this provision to realize savings to Medicare.

Use its monitoring of hospitals' billing for sepsis stays to take appropriate follow-up actions

The volume of sepsis stays, high payments, and varied billing call for close monitoring of hospital billing for sepsis stays. CMS has resumed its PEPPER reports, which have consistently named sepsis as a target area for billing errors.[10] While this is an important first step, CMS must do more with this information than provide it to hospitals. For example, CMS could use information from the PEPPER reports or new monitoring to determine appropriate follow-up actions—such as targeted medical record reviews or education—for hospitals that are billing for sepsis stays at higher volumes than expected and may be using the broad definition of sepsis to maximize payments.

Further, implementation of our first recommendation or any changes to the ICD-10 codes for sepsis will likely alter hospital billing. Accordingly, CMS should enhance its monitoring of hospital billing to assess trends and take appropriate follow-up actions. While we expect that use of sepsis diagnosis codes without organ dysfunction will decrease, there may be other unexpected changes in billing. Where CMS identifies concerning billing trends or outlier hospitals, CMS should conduct targeted follow-up, such as medical record reviews, or refer hospitals to the Recovery Auditors where appropriate.

AGENCY COMMENTS AND OIG RESPONSE

CMS neither concurred nor nonconcurred with our two recommendations and asked that they be removed. OIG maintains the importance of both recommendations for reducing the incentive for hospitals to bill sepsis stays to maximize Medicare payments. OIG did not remove the recommendations.

Specifically, CMS neither concurred nor nonconcurred with our first recommendation to adjust hospital payments to reduce the financial incentive to bill sepsis stays. CMS noted that it cannot propose modifications to the MS-DRG payments until diagnosis code changes are made through the ICD-10 Coordination and Maintenance Committee, which is co-chaired by CDC and CMS. CMS stated that it could then consider proposing changes to the MS-DRGs through rulemaking. CMS also stated that its analysis supports the inclusion of sepsis on the major complications and comorbidities list.

OIG recognizes that any changes to the diagnosis codes related to sepsis would need to be made through the ICD-10 Coordination and Maintenance Committee. However, our recommendation is not contingent on updates to the ICD-10 diagnosis codes. This recommendation addresses the way the existing diagnosis codes are paid through the MS-DRG payment system. CMS updates MS-DRGs annually through rulemaking and has removed and/or split MS-DRG groups in the past as part of these updates.[11] Therefore, this recommendation can be implemented without any changes to the ICD-10 diagnosis codes. If, in the future, the ICD-10 committee does change the sepsis codes, CMS should adjust the MS-DRGs accordingly to reduce the incentive for hospitals to bill sepsis stays to maximize Medicare payments.

CMS neither concurred nor nonconcurred with our second recommendation to use its monitoring of hospitals' billing for sepsis stays to take appropriate follow-up actions. CMS stated that the recommendation does not appear to require action outside its existing oversight framework, noting that its program integrity strategy to reduce and prevent improper payments includes data analysis and prepayment and post-payment reviews. CMS added that if a new sepsis code(s) were implemented, CMS could explore possible changes to monitoring and oversight of billing.

OIG acknowledges CMS's existing monitoring efforts. However, due to the variability in sepsis billing among hospitals, more must be done to ensure that hospitals are not using the broad definition to maximize payments. CMS could use information from the PEPPER reports or new monitoring to determine appropriate follow-up actions—such as targeted medical record reviews or education—for hospitals that are billing for sepsis stays at higher volumes than expected. After our first recommendation is implemented and/or the sepsis diagnosis codes are updated by the ICD-10 committee, CMS should monitor for changes in Medicare billing resulting from these updates. Monitoring hospital billing and taking appropriate action will help ensure the consistency and accuracy of hospital billing for sepsis nationwide.

For the full text of CMS's comments, see Appendix D.

DETAILED METHODOLOGY

Data Source

We based this data brief on an analysis of paid Medicare fee-for-service claims from the National Claims History File with dates of service in FY 2024. We excluded claims from hospitals that were not paid under the Inpatient Prospective Payment System (IPPS), such as long-term care hospitals, critical access hospitals, and hospitals in Maryland.

Identification of stays billed under the broad definition

We identified the total number of inpatient hospital stays in FY 2024 for which the hospital submitted a claim that included any type of sepsis diagnosis as a principal or secondary diagnosis. These sepsis diagnoses are considered qualifying principal diagnoses for the sepsis MS-DRGs 870-872 for FY 2024. For a full list of the diagnosis codes we used, see Appendix A.

We then calculated the number of claims that would meet the broad, but not the updated, definition of sepsis. That is, claims with a diagnosis of sepsis, but without a diagnosis of severe sepsis or septic shock and not assigned to MS-DRG 870. Claims that did include severe sepsis or septic shock would have been consistent with the updated definition because they indicate that the patient had a more severe condition that involved organ dysfunction. Claims assigned to MS-DRG 870 also would have been consistent with the updated definition of sepsis because this MS-DRG is used when a patient with a principal diagnosis of sepsis also received over 96 hours of mechanical ventilation, indicating organ dysfunction.

Analysis of stays billed under the broad definition of sepsis

We calculated the percent of all inpatient stays that would meet the broad definition of sepsis but not the updated one.

We then calculated the total amount paid for these stays by combining Medicare payments with enrollee deductibles and coinsurance. We also calculated the average total payment per stay for these claims.

Estimate of funds that could be put to better use

From the claims identified above, we removed the sepsis diagnosis from the claim and determined whether the claim would have been assigned to an alternative MS-DRG in this model scenario. We reassigned MS-DRGs among two groups of inpatient claims: (1) claims in a sepsis MS-DRG and (2) claims in another MS-DRG but with sepsis as a principal and/or secondary diagnosis. For group (1) we reassigned the base DRG according to the earliest major complication or comorbidity (MCC) in secondary diagnosis code order, or if there was none, to the earliest complication or

comorbidity (CC). For group (2) we adjusted the severity level within the already-assigned base DRG according to whether MCCs or CCs still were present after removal of any sepsis diagnoses.

We then estimated a new payment amount for each claim using a ratio of the relative weights associated with the original MS-DRG and the alternative MS-DRG.[12] The relative weight of a MS-DRG represents the average resources required to care for a patient in that particular MS-DRG and is the most significant factor in determining the Medicare payment amount. CMS publishes the relative weight associated with each MS-DRG annually.

We calculated the difference between the original payment amount and the estimated payment amount. Finally, we summed these differences across all claims in the model and calculated the average difference per claim.

Analysis of stays billed under the broad definition of sepsis at the hospital level

We calculated the percent of all inpatient stays that met the broad, but would not have been consistent with the updated, definition of sepsis at the hospital level, reporting the interpercentile range as the 1st and 99th percentiles. We limited this analysis to the 2,975 hospitals that had 50 or more inpatient stays in FY 2024.

We determined the length of each stay billed under the broad definition of sepsis and the interpercentile range (1st and 99th percentiles) of lengths of stay for these claims. We used the claim admission date and claim through date to calculate the length of each stay. We also assessed the number of these sepsis stays that were 3 days or fewer. We excluded from this analysis stays with discharge codes indicating that the enrollee was transferred to another acute-care facility, left against medical advice, elected hospice care, or died; and those with admission source codes indicating that the beneficiary transferred from another acute-care hospital.

We also assessed which of the sepsis stays were billed to high-severity MS-DRGs—those "with MCC" or "with CC/MCC"—both before and after applying our model.

We also assessed the percentage of stays that were 3 days or fewer and the percentage of stays at the high severity level at the hospital level. We calculated the interpercentile range of each metric as the 1st and 99th percentiles. We limited these hospital level analyses to hospitals that had 50 or more inpatient stays, and 10 or more sepsis stays in our model population. For the severity level analysis, this amounted to 2,735 hospitals, and for length of stay this amounted to 2,665 hospitals due to the additional exclusion criteria described above.

Limitations

This study is based on an analysis of claims data. The model we developed estimates the funds that could be put to better use (i.e., the difference in hospital payments associated with the updated definition of sepsis). The model assumes the accuracy of the information submitted by hospitals (i.e., that a severe sepsis diagnosis code

was submitted when organ dysfunction was present and was not submitted when organ dysfunction was not present). We did not conduct medical record reviews to verify the presence or absence of organ dysfunction.

Standards

We conducted this study in accordance with the *Quality Standards for Inspection and Evaluation* issued in 2020 by the Council of the Inspectors General on Integrity and Efficiency.

APPENDICES

Appendix A: List of Sepsis Diagnosis Codes

ICD-10-CM Diagnosis Code	ICD-10-CM Description
Sepsis	
A021	Salmonella sepsis
A207	Septicemic plague
A227	Anthrax sepsis
A267	Erysipelothrix sepsis
A327	Listerial sepsis
A391	Waterhouse-Friderichsen syndrome
A392	Acute meningococcemia
A393	Chronic meningococcemia
A394	Meningococcemia, unspecified
A3989	Other meningococcal infections
A399	Meningococcal infection, unspecified
A400	Sepsis due to streptococcus, group A
A401	Sepsis due to streptococcus, group B
A403	Sepsis due to Streptococcus pneumoniae
A408	Other streptococcal sepsis
A409	Streptococcal sepsis, unspecified
A4101	Sepsis due to Methicillin susceptible Staphylococcus aureus
A4102	Sepsis due to Methicillin resistant Staphylococcus aureus
A411	Sepsis due to other specified staphylococcus
A412	Sepsis due to unspecified staphylococcus
A413	Sepsis due to Hemophilus influenzae
A414	Sepsis due to anaerobes
A4150	Gram-negative sepsis, unspecified
A4151	Sepsis due to Escherichia coli [E. coli]
A4152	Sepsis due to Pseudomonas
A4153	Sepsis due to Serratia
A4154	Sepsis due to Acinetobacter baumannii
A4159	Other Gram-negative sepsis
A4181	Sepsis due to Enterococcus
A4189	Other specified sepsis
A419	Sepsis, unspecified organism
A427	Actinomycotic sepsis
A5486	Gonococcal sepsis
B007	Disseminated herpesviral disease

B377	Candidal sepsis
R571	Hypovolemic shock
R578	Other shock
R7881	Bacteremia
Severe sepsis	
R6520	Severe sepsis without septic shock
Septic shock	
R6521	Severe sepsis with septic shock

Note: These diagnoses are principal diagnoses for the sepsis MS-DRGs 870-872 for FY 2024.

Source: CMS, "MDC 18 Infectious and parasitic diseases, systemic or unspecified sites: Septicemia or severe sepsis," DRG Principal Diagnoses, *ICD-10-CM/PCD MS-DRG v41.0 Definitions Manual* (March 1, 2023). Available at https://www.cms.gov/icd10m/FY2024-nprmversion41.0-fullcode-cms/fullcode_cms/P0336.html. Accessed on July 29, 2025.

Appendix B: Medicare Inpatient Hospital Stays Billed with Sepsis in FY 2024

	Number of stays	Percentage of inpatient hospital stays
Sepsis	**615,007**	**9.4%**
Severe sepsis	211,186	3.2%
Septic shock	227,225	3.5%
Any sepsis + >96 hours of mechanical ventilation	26,202	0.4%
Total stays with sepsis	**1,079,620**	**16.5%**
Total inpatient stays	6,556,071	

Note: This table does not reflect the numbers of unique diagnoses. ICD-10-CM billing guidance requires that both a sepsis diagnosis and a severe sepsis or septic shock diagnosis are billed if applicable. This table reflects the most severe level of sepsis billed on the claim. For example, a claim with both sepsis and septic shock diagnoses billed is included here as "septic shock."

Source: OIG analysis of FY 2024 inpatient hospital claims.

Appendix C: MS-DRG Titles

MS-DRG	Description
870	Septicemia or Severe Sepsis with Mechanical Ventilation >96 Hours
871	Septicemia or Severe Sepsis without Mechanical Ventilation >96 Hours with MCC
872	Septicemia or Severe Sepsis without Mechanical Ventilation >96 Hours without MCC
193	Simple Pneumonia and Pleurisy with MCC
314	Other Circulatory System Diagnoses with MCC
315	Other Circulatory System Diagnoses with CC

Note: We refer to MS-DRGs 870-872 as the sepsis DRGs. "Septicemia" is a less commonly used term that indicates a systemic infection of the blood.

Source: CMS, "Files for FY 2024 Final Rule and Correction Notice," Table 5. Available at https://www.cms.gov/medicare/payment/prospective-payment-systems/acute-inpatient-pps/acute-inpatient-files-download/files-fy-2024-final-rule-correction-notice. Accessed on July 17, 2026.

Appendix D: Agency Comments

Following this page are the official comments from CMS.

DATE: June 17, 2026

TO: Ann Maxwell
Deputy Inspector General for Evaluation and Inspections
Office of Inspector General

FROM: Dr. Mehmet Oz
Administrator
Centers for Medicare & Medicaid Services

SUBJECT: Office of Inspector General (OIG) Draft Data Brief: Medicare Could Save Billions on Sepsis Stays by Adjusting Hospital Payments To Be Consistent with the Updated Definition of Sepsis (OEI-02-24-00230)

The Centers for Medicare & Medicaid Services (CMS) appreciates the opportunity to review and comment on the Office of Inspector General's (OIG) draft report.

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) required the adoption and use of national standards governing the nature and content of electronic transactions in health care. The standard, national medical coding and classification systems adopted under HIPAA identify medical items and services and are essential for ensuring that electronic medical claims are processed in a consistent and efficient manner by all payers of healthcare services.[1] Codes for medical diagnoses, procedures, services, and equipment are included in different coding and classification systems and are maintained and updated by different entities.

Providers use the United States versions of the International Classification of Diseases, 10th Revision (ICD–10) coding system to report diagnoses and procedures for Medicare hospital inpatient services under the Medicare Severity Diagnosis Related Group (MS–DRG) system. Within the MS-DRG system, each DRG weight represents the average resources required to care for cases in that particular DRG, relative to the average resources used to treat cases in all DRGs. The ICD–10 coding system includes the International Classification of Diseases, 10th Revision, Clinical Modification (ICD–10–CM) for diagnosis coding and the International Classification of Diseases, 10th Revision, Procedure Coding System (ICD–10–PCS) for inpatient hospital procedure coding, as well as the ICD–10–CM and ICD–10–PCS Official Guidelines for Coding and Reporting.

The ICD-10 Coordination and Maintenance (C&M) Committee is a Federal interdepartmental committee comprised of representatives from CMS and the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS). The committee is responsible for approving coding changes, developing errata, addenda and other modifications. CMS maintains and updates the ICD-10-PCS and CDC maintains and updates the ICD-10-CM. The ICD-10-CM maintenance and update process is consensus-based. The process involves presentations of proposed diagnosis code changes during the ICD-10 C&M Committee meeting,

[1] The standard medical data code sets are defined at 45 CFR 162.1002.

followed by a public comment period. If suggested changes to a proposal are raised during the public comment period, such proposals will be revised and re-opened for consideration during the next meeting; this cycle may be repeated more than once to achieve consensus.

The focus of this report is on the definition of sepsis as classified by the ICD-10-CM and defined by the Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). CDC has lead responsibility for the diagnosis code set. Any proposed ICD-10-CM changes must be brought to the ICD-10 C&M Committee meeting for public input and feedback. There was a proposal to make updates to ICD-10-CM presented in September 2019 related to the Sepsis-3 definition. However, the proposal was not supported in public comments, and the proposed changes did not go forward at that time. Most recently, CDC proposed changes to the ICD-10-CM pertaining to sepsis in March 2026. CDC proposed, among other things, implementing the Sepsis-3 definition and creating codes for impending sepsis distinct from sepsis.[2] Notably, the ICD-10-CM standard does not include diagnostic criteria. The code assignment is based on a clinical provider's documentation of sepsis in the health record.

The OIG's report asserts that stays that did not include an additional code for severe sepsis or septic shock, which generally indicates organ dysfunction, would have been paid differently because they likely would have been assigned to a different base DRG or a lower severity level. However, OIG's methodology does not account for patients diagnosed with sepsis under the current code set that are at risk of developing organ dysfunction and the resources required to treat them. These patients require an elevated level of monitoring and intervention to prevent progression to life-threatening organ dysfunction. If diagnosis code changes are made through the consensus-based process, as discussed above, CMS could subsequently consider proposing changes to the MS-DRGs via the inpatient prospective payment system (IPPS) rulemaking process. If the proposed MS-DRG changes are finalized, the sepsis hospital stays referenced would then be paid based on the updated diagnosis code(s) and updated MS-DRGs to better reflect the resources required to care for those cases.

The OIG's recommendations and CMS' responses are below.

OIG Recommendation

The OIG recommends that CMS should adjust hospital payments to reduce financial incentive to bill sepsis stays.

CMS Response

CMS continues to request that this recommendation be removed. As stated above, providers are required to use the International Classification of Diseases, 10th Revision, Clinical Modification (ICD–10-CM) coding system to report diagnoses for Medicare hospital inpatient services under the Medicare Severity Diagnosis Related Group (MS–DRG) system. The assignment of a diagnosis code is based on the provider's diagnostic statement that the condition exists.

CMS cannot propose to modify the MS-DRG GROUPER logic until the diagnosis code changes are made through the established consensus-based process. If diagnosis code changes are made through the established processes (which are actively being explored by CDC), CMS could subsequently consider proposing changes to the MS-DRGs via inpatient prospective payment system (IPPS) rulemaking.

[2] Information from the ICD-10-CM Committee Meetings is available on CDC's website at: https://www.cdc.gov/nchs/icd/icd-10-maintenance/meetings.html

CMS conducts an analysis of the MS-DRG classifications each year as part of the annual rulemaking process. The current data supports the inclusion of sepsis on the major complications and comorbidities list. CMS will continue to monitor the data and update the classifications, if necessary, as part of our standard process.[3]

OIG Recommendation

The OIG recommends that CMS use its monitoring of hospitals' billing for sepsis stays to take appropriate follow-up actions.

CMS Response

CMS continues to request that this recommendation be removed. This recommendation does not appear to require action outside of our existing oversight framework. CMS uses a robust program integrity strategy to reduce and prevent Medicare improper payments, including data analysis and conducting prepayment and post-payment reviews. As part of this strategy, CMS recovers identified overpayments in accordance with agency policies and procedures.

For example, as noted by OIG, CMS makes available the Program for Evaluating Payment Patterns Electronic Report (PEPPER), a file that summarizes provider-specific Medicare data statistics for target areas often associated with Medicare improper payments due to billing, DRG coding, and/or admission necessity issues.[4] Hospitals and facilities are encouraged to conduct regular audits to ensure that bills submitted for Medicare services are correct. CMS has also approved complex reviews of inpatient hospital MS-DRG coding validation for the Recovery Audit Contractors (RACs).[5]

If a new sepsis code(s) were to be implemented, CMS could explore whether changes to the methodologies for monitoring and oversight of billing are necessary. Additionally, any potential changes to the existing process could not be implemented until new diagnosis codes are finalized which is outside the purview of CMS and requires consensus on the handling of people with severe systemic infection who have not developed organ dysfunction and whether to define this as impending sepsis, which is not included in the Sepsis-3 definition.

[3] The data analysis for sepsis codes when reported as a secondary diagnosis is reflected in the Impact on Resource Use file located at: https://www.cms.gov/medicare/payment/prospective-payment-systems/acute-inpatient-pps/ms-drg-classifications-and-software

[4] Additional information regarding PEPPER is available at: https://pepper.cbrpepper.org/index.html

[5] Additional information regarding the RAC approved review is available at: https://www.cms.gov/research-statistics-data-and-systems/monitoring-programs/medicare-ffs-compliance-programs/recovery-audit-program/approved-rac-topics-items/0001-inpatient-hospital-ms-drg-coding-validation

ENDNOTES

[1] Centers for Disease Control and Prevention (CDC), "What is sepsis?," March 23, 2026. Available at https://www.cdc.gov/sepsis/about/?CDC_AAref_Val=https://www.cdc.gov/sepsis/what-is-sepsis.html. Accessed on July 17, 2026.

[2] Stays assigned to DRG 870 "Sepsis with >96 hours of mechanical ventilation" were also not the focus of our review because these stays would have been consistent with the updated definition. See Appendix B for the frequency of these stays.

[3] These dollar amounts include any coinsurance or deductible amounts paid by the Medicare enrollee.

[4] Mervyn Singer, Clifford S. Deutschman, Christopher Warren Seymour, et al., "The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)," *JAMA*, vol. 315, no. 8 (February 23, 2016), pp. 801-810. doi:10.1001/jama.2016.0287. Available at https://jamanetwork.com/journals/jama/fullarticle/2492881. Accessed on September 15, 2025.

[5] CMS requires that a patient have severe sepsis (organ dysfunction) for its sepsis management bundle, which is consistent with the updated definition.

[6] The sepsis diagnosis did not directly impact the amount Medicare paid for the remaining 207,618 of the 615,007 stays.

[7] There are cases in which the hospital may receive an outlier payment for high-cost stays. 42 CFR 412.80(a)(3).

[8] SSA, § 1886(d)(4)(C).

[9] SSA, § 1886(d)(3)(A)(vi).

[10] CMS implemented refinements to these "Program for Evaluating Payment Patterns Electronic Reports" (PEPPERs) and began making them available to hospitals again as of December 2025. https://pepper.cbrpepper.org/index.html.

[11] SSA, § 1886(d)(4)(C). Examples of previous removal and/or splitting of DRGs in annual rulemaking: The FY 2026 IPPS Final Rule removed MS-DRGs 294 and 295 for deep vein thrombophlebitis due to lack of use. The rule also added MS-DRGs 359, 360, and 318 to better stratify case complexity for percutaneous coronary atherectomy. See 90 Fed. Reg. 36604 and 36591, respectively (Aug. 4, 2025).

[12] Note that CMS uses PRICER software to determine Medicare claim payment amounts. We favored the relative weight ratio approach because it best accomplished our goal of approximating the difference in payment associated with a change in MS-DRG, while holding other factors that contribute to payment (such as hospital-specific factors) constant.

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