Addendum to HCUP Statistical Brief #310: State Variation in Inpatient Stays Involving Sepsis, 2021, Updated with 2022 Data

HCUP Statistical Brief #310 Addendum to Update with 2022 Data | June 2025

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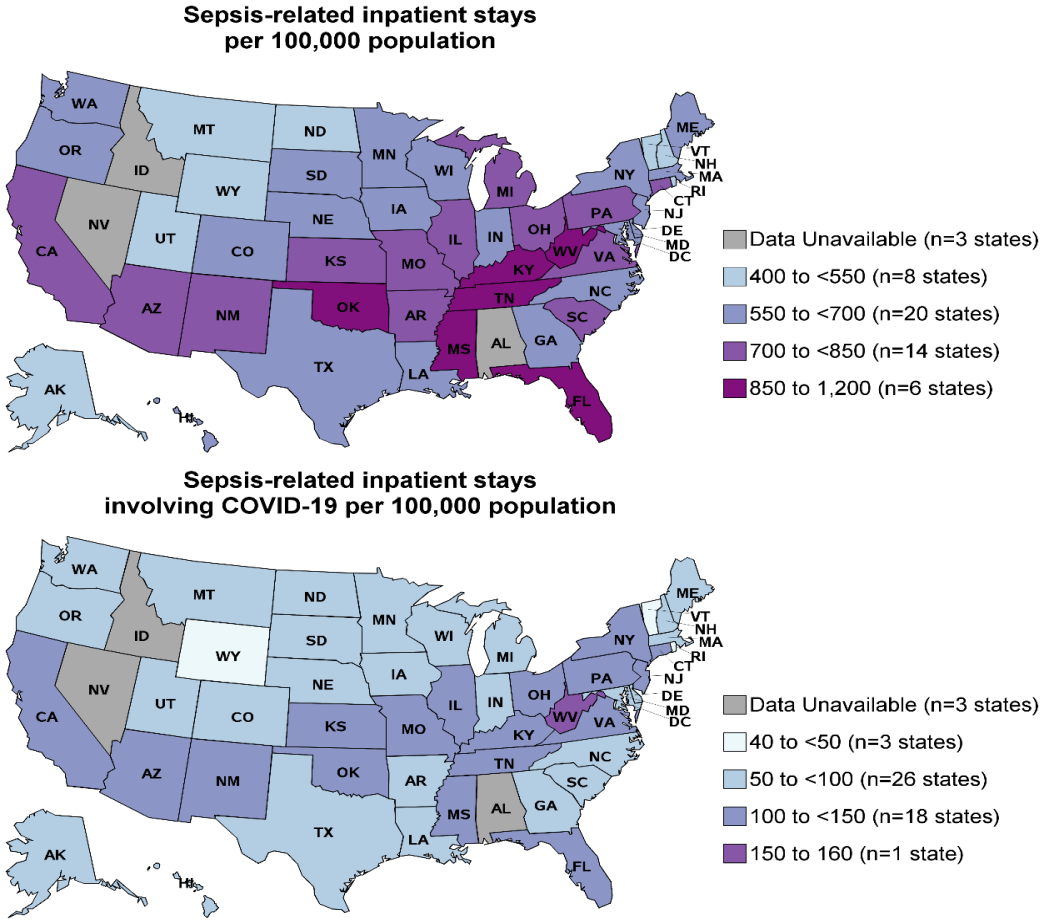
This is an addendum to HCUP Statistical Brief #310, State Variation in Inpatient Stays Involving Sepsis, 2021, providing exhibits with 2022 data. Please refer to the main Statistical Brief for information related to methodology (i.e., definitions and calculations), suggested citation, and contact information.

Findings

Population Rates of Sepsis-Related Inpatient Stays by State

Figure 1 presents the state-specific rates of sepsis-related inpatient stays and the subset of sepsis-related inpatient stays involving a diagnosis of COVID-19 per 100,000 population in 2022. These data are reported by the patient's state of residence, which may differ from the state in which they were treated for sepsis. Appendix B provides additional detail on the state-specific rates.

Figure 1. State-specific population rates of sepsis-related inpatient stays overall and involving COVID-19, 2022

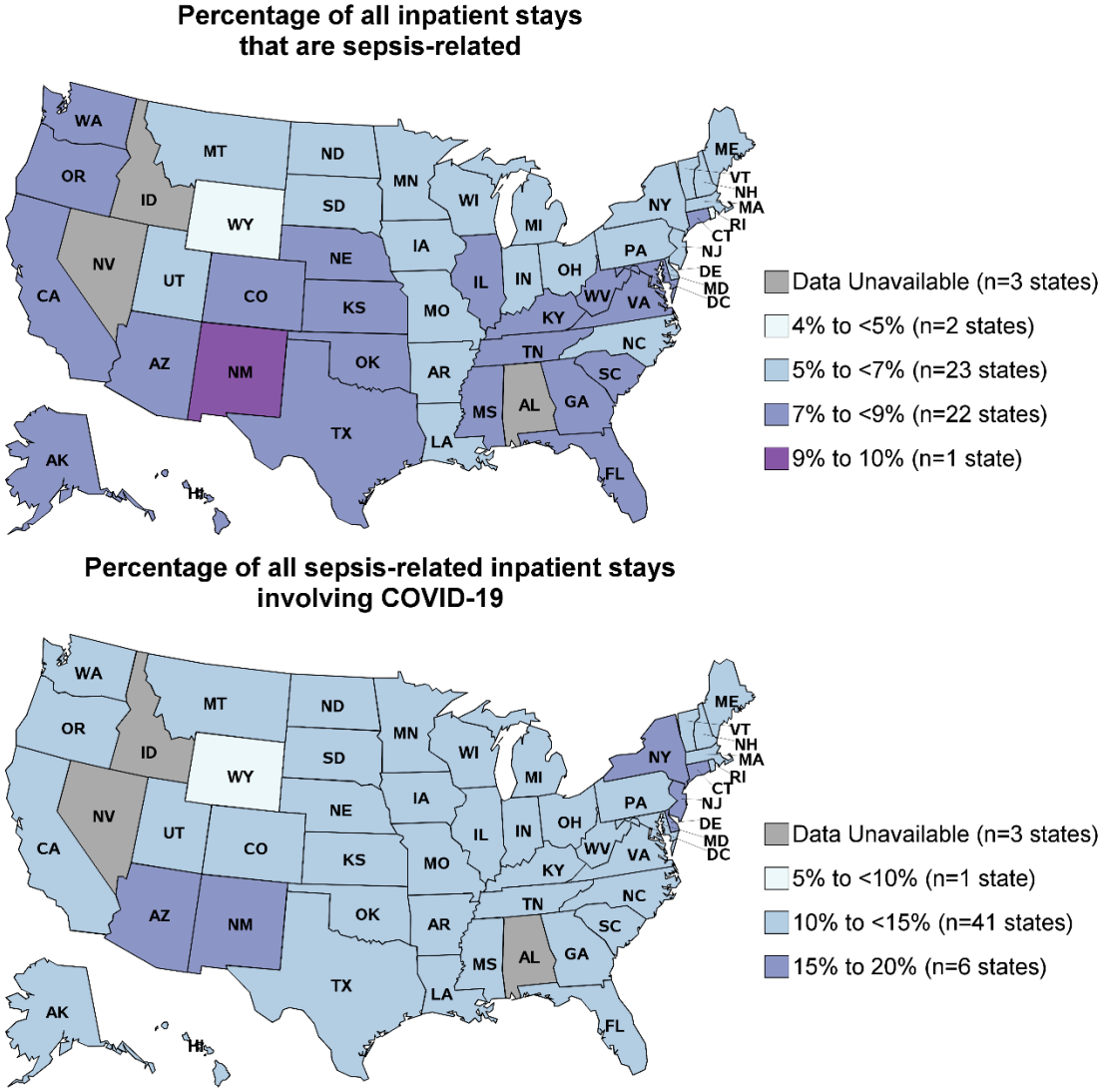


Note: The population rate of sepsis-related inpatient stays was based on any-listed diagnosis of sepsis.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2022, 47 states and the District of Columbia.

Percentage of Inpatient Stays Related to Sepsis across States

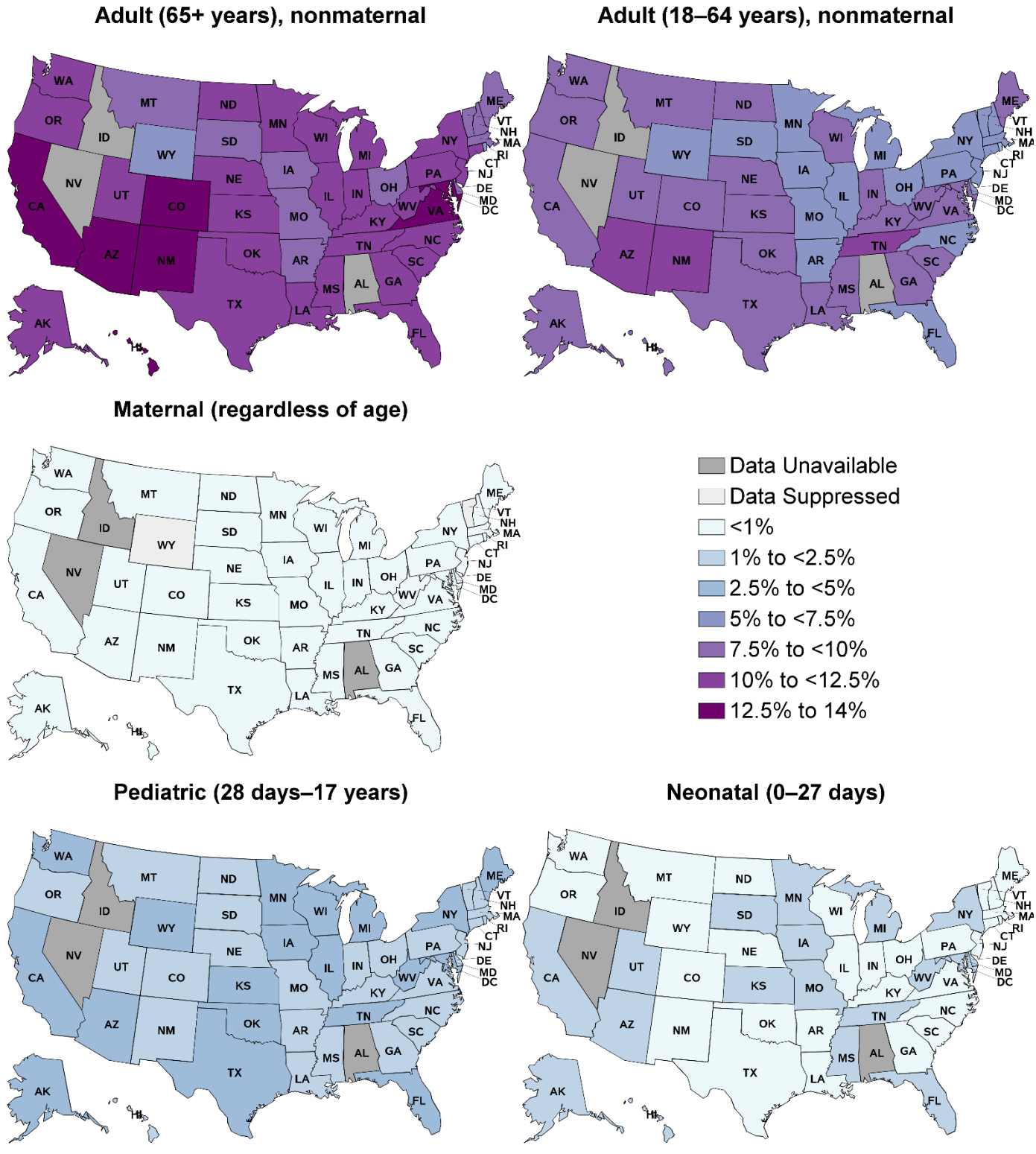
Figures 2, 3, and 4 present the state-specific percentages of inpatient stays that are related to sepsis in 2022. Unlike the population rates presented in Figure 1, this measure examines sepsis-related hospitalizations by the state in which the hospitalization occurred. Figure 2 includes overall percentages for all hospitalized patients. Figure 3 shows the percentages by patient population (nonmaternal adult patients 65 years and older, nonmaternal adult patients 18-64 years, patients with maternal conditions, children aged 28 days - 17 years (pediatric patients), and neonatal patients aged 0-27 days). Figure 4 shows the percentages of sepsis-related inpatient stays involving COVID-19 by nonmaternal adult patient populations. Appendix B provides additional detail on the state-specific percentages.

Figure 2. Percentage of inpatient stays related to sepsis, overall and involving COVID-19, 2022



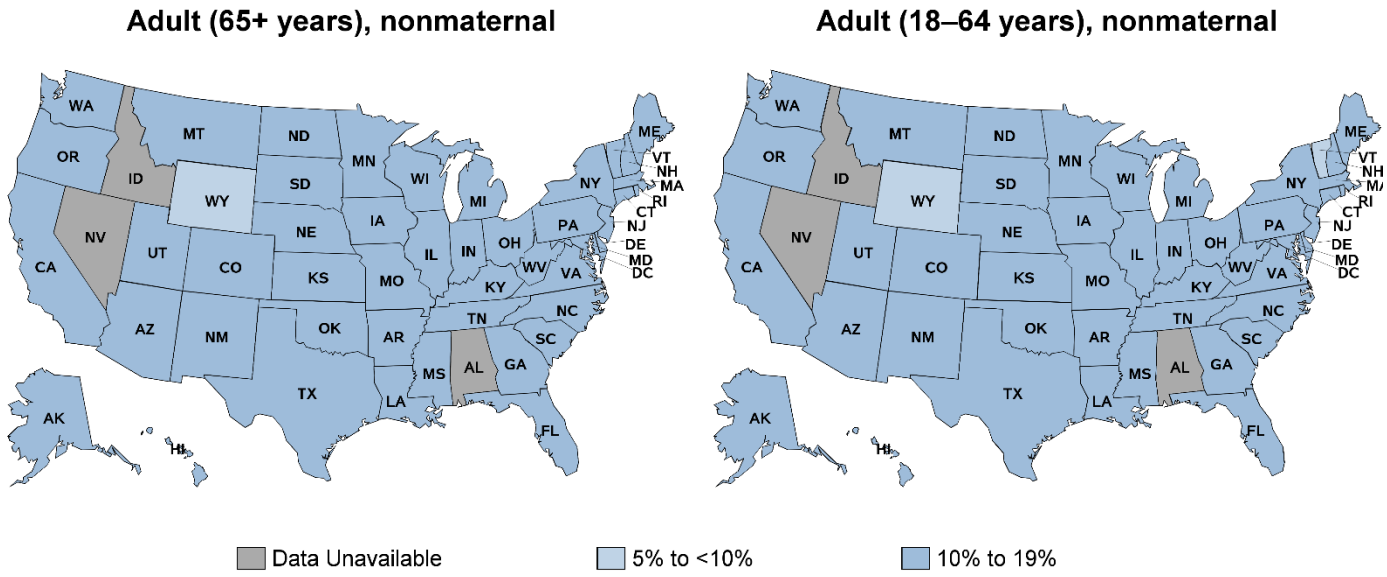
Note: The percentage of sepsis-related inpatient stays was based on any-listed diagnosis of sepsis.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2022, 47 states and the District of Columbia.

Figure 3. Percentage of inpatient stays related to sepsis by patient population, 2022



Note: The percentage of sepsis-related inpatient stays was based on any-listed diagnosis of sepsis. Data are suppressed for states with less than 11 sepsis-related inpatient stays.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2022, 47 states and the District of Columbia.

Figure 4. Percentage of sepsis-related inpatient stays involving COVID-19 by patient population, 2022

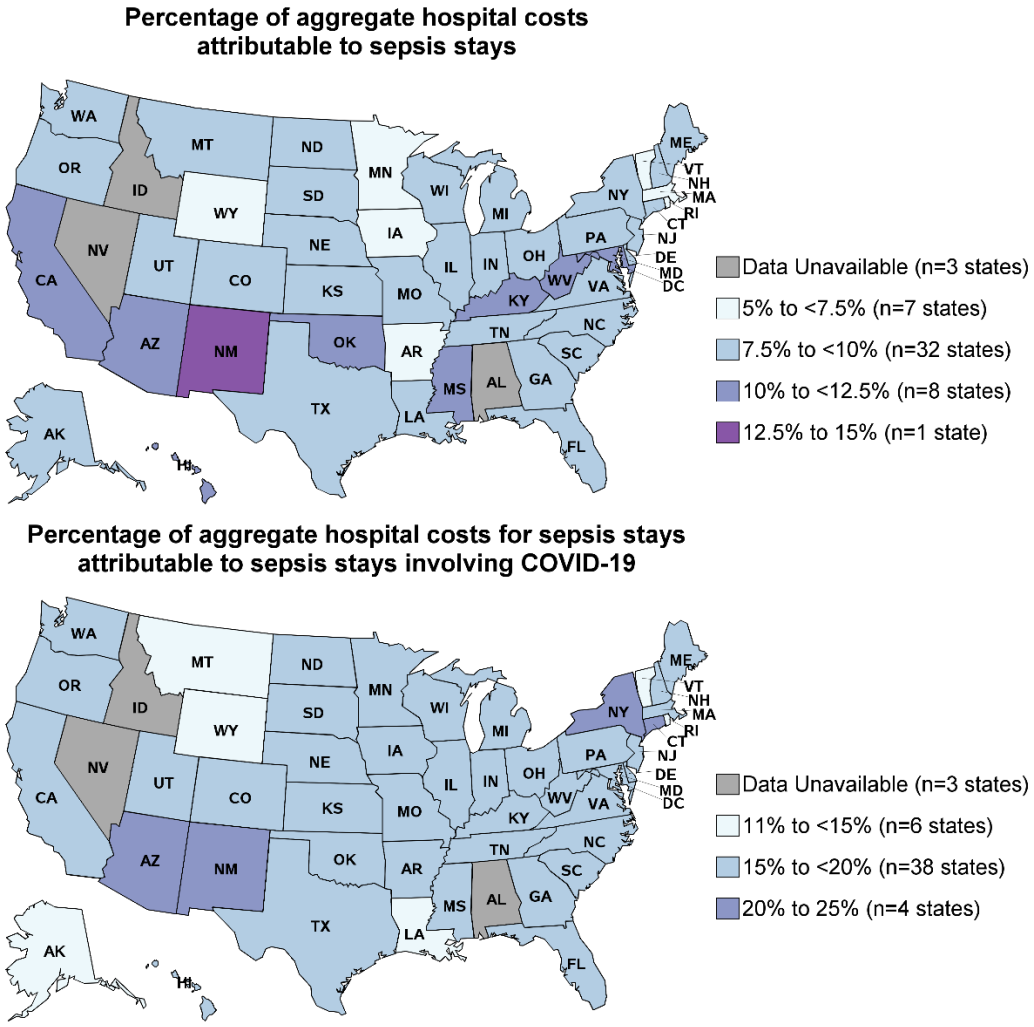


Note: The percentage of sepsis-related inpatient stays was based on any-listed diagnosis of sepsis. Maternal, pediatric, and neonatal patient population data are not reported due to small sample sizes in some states.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2022, 47 states and the District of Columbia.

Percentage of Hospital Costs for Sepsis Stays across States

Figure 5 presents the percentage of total hospital costs attributable to stays due to sepsis (i.e., sepsis is the principal diagnosis). In addition, Figure 5 presents the percentage of aggregate hospital costs for sepsis stays that are attributable to sepsis stays involving COVID-19 across states in 2022. Appendix B provides additional detail on the state-specific percentages.

Figure 5. Percentage of total hospital costs attributable to sepsis stays and the percentage of total sepsis hospital costs attributable to sepsis stays with COVID-19, 2022

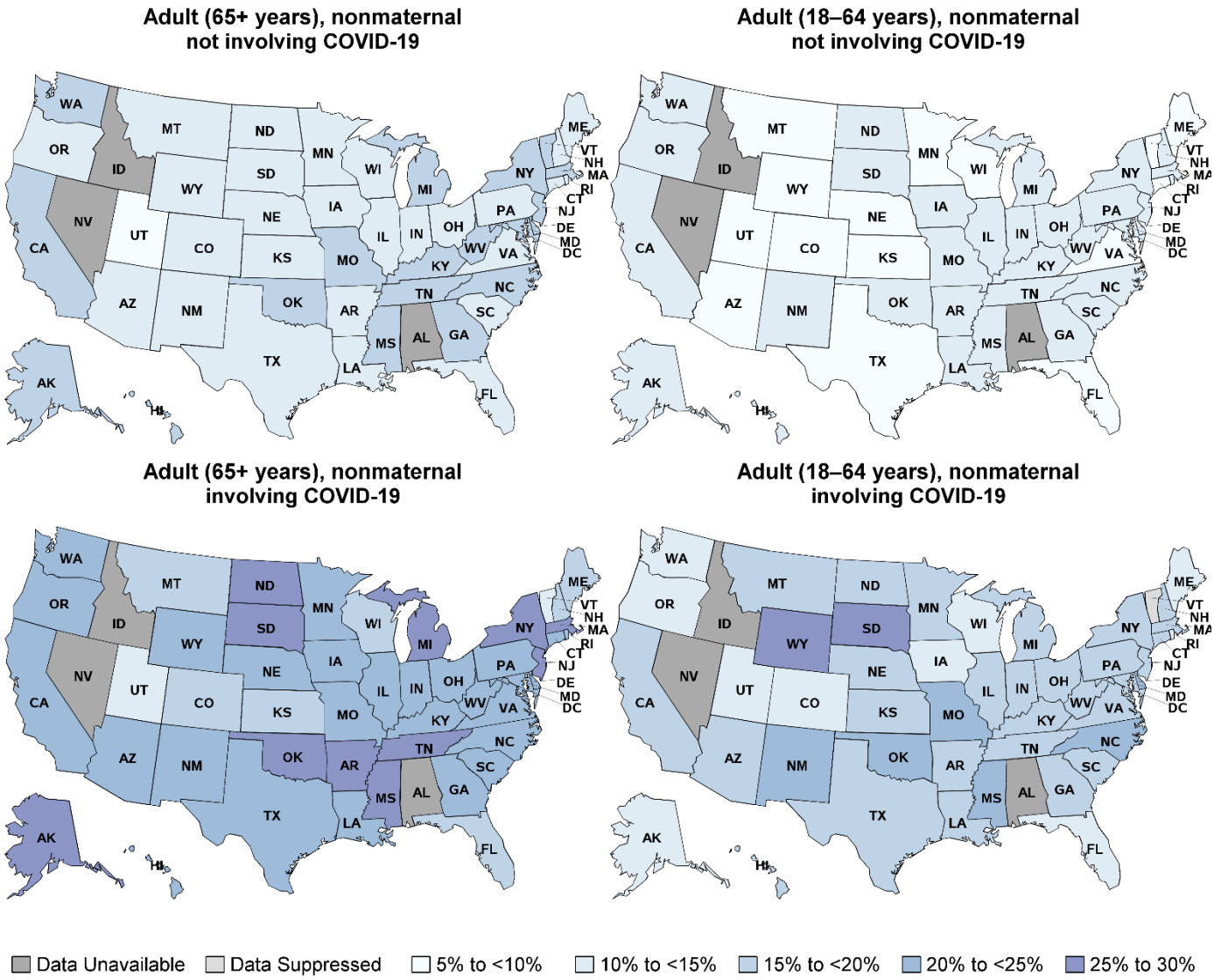


Note: Aggregate hospital cost was based on stays in which sepsis was the reason for the stay (i.e., principal diagnosis).
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2022, 47 states and the District of Columbia.

In-Hospital Mortality among Sepsis Inpatient Stays across States

Figure 6 presents state-specific in-hospital mortality rates per 100 sepsis stays among the two nonmaternal adult patient populations by presence of any COVID-19 diagnosis in 2022. To account for differences in in-hospital mortality due to age, Figure 6 displays age-stratified in-hospital mortality rates for sepsis inpatient stays for nonmaternal adults aged 18–64 and 65+ years. Appendix B provides additional detail on the state-specific rates.

Figure 6. In-hospital mortality rate for sepsis inpatient stays among nonmaternal adults by presence of COVID-19 diagnosis, 2022



Notes: In-hospital mortality rates were based on stays in which sepsis was the reason for the stay (i.e., principal diagnosis). Maternal, pediatric, and neonatal patient population data are not reported due to small sample sizes in some states.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2022, 47 states and the District of Columbia.

Data Source

This Statistical Brief uses data from the Healthcare Cost and Utilization Project (HCUP) 2022 State Inpatient Databases (SID) for 47 states and the District of Columbia. States include Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

Population Studied

This analysis focused on inpatient stays with any-listed ICD-10-CM diagnosis of sepsis. Although this analysis focused on inpatient stays related to sepsis, the clinical criteria for defining sepsis varied across patient populations. The ICD-10-CM diagnoses codes used to identify a sepsis infection are included in Appendix A, Table A.1. The ICD-10-CM diagnoses codes used to identify organ dysfunction are included in Appendix A, Table A.2. The ICD-10-CM/PCS codes used to identify a maternal case are included in Appendix A, Table A.3. Table 1 provides the clinical criteria used to define mutually exclusive patient populations for sepsis-related inpatient stays.

Table 1. Clinical Coding Criteria for Identifying Sepsis-Related Inpatient Stays for Mutually Exclusive Patient Populations

Population	Maternal	Age Criteria	Sepsis Criteria
Maternal	Yes – Any DX indicating a maternal condition as identified by QI setname MDC14PRINDX*	Any age	Any ICD-10-CM diagnosis of the following: • Septic shock** • Severe sepsis*** • Any other diagnosis indicating sepsis *with* at least one diagnosis indicating organ dysfunction (including maternal "O" organ dysfunction codes)
Adult	No	65 years and older****	Any ICD-10-CM diagnosis of the following: • Septic shock** • Severe sepsis*** • Any other diagnosis indicating sepsis *with* at least one diagnosis indicating organ dysfunction
Adult	No	18-64 years	Any ICD-10-CM diagnosis of the following: • Septic shock** • Severe sepsis*** • Any other diagnosis indicating sepsis *with* at least one diagnosis indicating organ dysfunction
Pediatric	No	Age 0 with age in days > 27 days *or* age 1-17 years	Any ICD-10-CM diagnosis of the following: • Septic shock** • Severe sepsis*** • Any other diagnosis indicating sepsis (no requirement to have indication of organ dysfunction)
Neonatal	No	Age in days of 0-27	Any ICD-10-CM diagnosis of the following: • Septic shock** • Severe sepsis*** • Any other diagnosis indicating sepsis (no requirement to have indication of organ dysfunction)

*AHRQ Prevention Quality Indictor (PQI), Appendix F: MDC 14 and MDC 15 Principal Diagnosis Codes, v2023 (https://qualityindicators.ahrq.gov/Downloads/Modules/PQI/V2023/TechSpecs/PQI_Appendix_F.pdf). Accessed November 10, 2023.

** Septic shock identified by ICD-10-CM diagnoses R6521 and T8112XA.
*** Severe sepsis identified by ICD-10-CM diagnosis R6520.
**** The adults aged 18 years and older group included a small percentage of records (less than 0.02 percent) of sepsis-related inpatient stays missing patient age information. Records missing patient age information were included in this group because it was the largest of the patient populations.

Sepsis as the reason for the inpatient stay

For this Statistical Brief, outcomes (in-hospital mortality and percentage of hospital costs) are reported only when sepsis was the reason for the inpatient stay (i.e., principal diagnosis). Outcomes for stays when sepsis was a co-occurring condition or complication of the stay (i.e., only reported as a secondary diagnosis) are not examined in this Statistical Brief. For stays in which sepsis was a co-occurring condition or complication of the stay, other conditions, such as cancer, pneumonia, or heart failure, may be the reason for the inpatient stay and contribute to increased length of stay or hospital costs. Thus, outcomes for these inpatient stays cannot be attributed solely to sepsis.

Please refer to Statistical Brief #310 for information related to methodology (i.e., definitions and calculations), suggested citation, and contact information.

This Statistical Brief addendum was posted online on June 11, 2025.