Agency for Healthcare Research and Quality | H·CUP HEALTHCARE COST AND UTILIZATION PROJECT

State Variation in Inpatient Stays Involving Sepsis, 2021

Statistical Brief #310 | September 2024

Marc Roemer, M.S., Marc Zodet, M.S., Desiree Esselman, M.P.H., Minya Sheng, M.S.

Introduction

Sepsis is a systemic inflammatory response to infection that results in tissue damage and organ failure and can lead to death.[1] In 2021, there were about 2.5 million inpatient stays in U.S. hospitals related to sepsis, accounting for 9.9 percent of all hospital costs.[2] One in three patients who died in the hospital had sepsis during their hospitalization.[3] State variation in sepsis-related hospitalizations and outcomes can be explained by several factors, including population risk factors, hospital characteristics, and state mandates and initiatives that support the use of evidence-based practices. Assessing state variation in sepsis-related hospitalizations and outcomes may reveal opportunities for improving sepsis care through targeted quality improvement and policy initiatives.

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief uses the 2021 State Inpatient Databases (SID) on inpatient stays involving sepsis in 47 states and the District of Columbia to present state-level statistics on sepsis hospitalizations and outcomes in non-Federal acute care hospitals. Statistics are stratified by five patient populations: 1) adults aged 65 years and older with nonmaternal conditions, 2) adults 18–64 years with nonmaternal conditions, 3) patients with maternal conditions regardless of age, 4) children aged 28 days–17 years (pediatric), and 5) neonates aged 0–27 days. Inpatient stays related to sepsis were identified by any diagnosis of sepsis on the medical record, i.e., principal diagnosis of sepsis (the reason for the stay) or a secondary diagnosis (a co-occurring condition or complication of the stay). Information is also presented about sepsis-related inpatient stays that involved any diagnosis of COVID-19.

The outcomes, hospital costs and in-hospital mortality rates, are reported only for stays when sepsis was the reason for the stay (i.e., principal diagnosis). 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. Additional information on the clinical coding criteria for identifying sepsis and maternal conditions is included in the Methods section and Appendix A.

Because of the large sample size of the available data, small differences can be statistically significant but not clinically important. Thus, only differences greater than or equal to 10 percent are discussed in the text.

Highlights

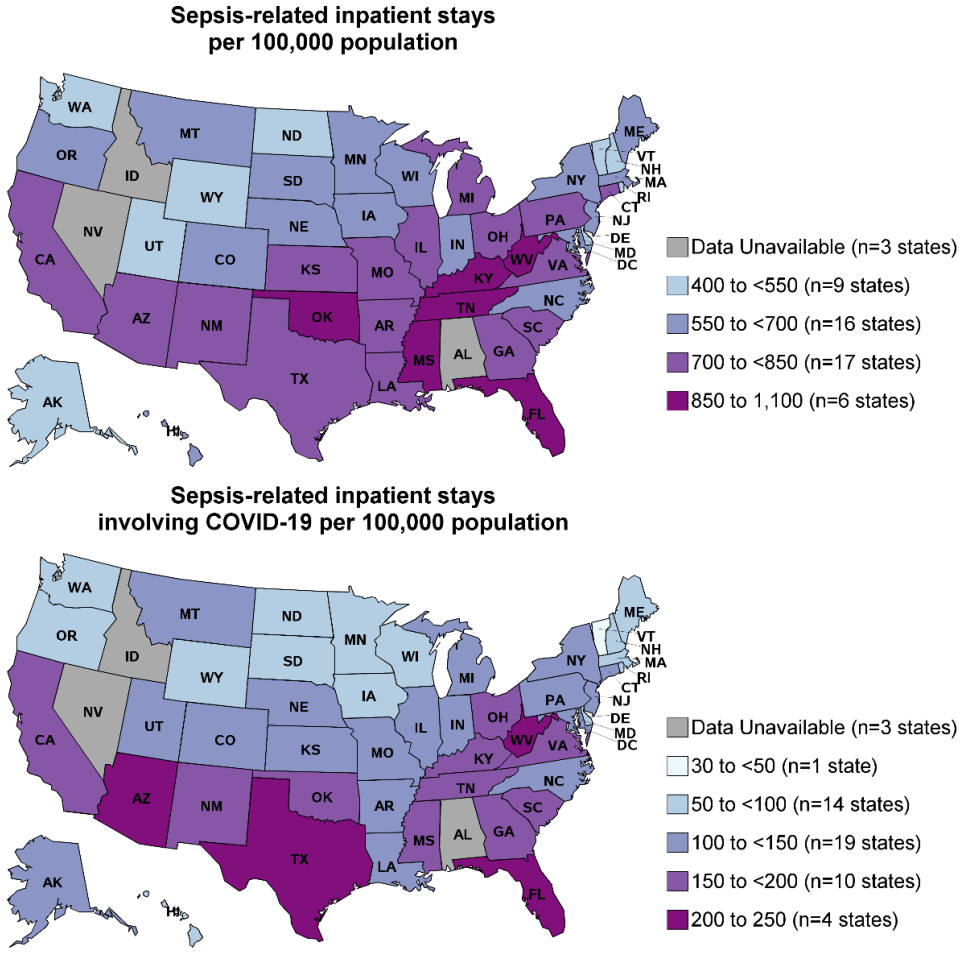
- In 2021, the percentage of inpatient stays related to sepsis ranged from 4.2 percent in Rhode Island to 9.1 percent in Arizona.
- The percentage of inpatient stays related to sepsis and the percentage of sepsis-related inpatient stays involving COVID-19 were higher in Southern and Western states relative to Northeastern and Midwestern states in 2021.
- In 2021, among stays for nonmaternal adults, the highest percentages of sepsis-related inpatient stays involving COVID-19 were found in states in the South compared with those in the Northeast, Midwest, or West.
- In 2021, the percentage of aggregate hospital costs attributable to sepsis stays ranged from 5.1 percent in Rhode Island to 12.8 percent in Arizona.
- Among nonmaternal adults aged 18–64 years, the District of Columbia had the highest in-hospital mortality rate for sepsis stays not involving COVID-19 in 2021, while Kansas had the lowest rate.

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 2021. 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, 2021



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), 2021, 47 states and the District of Columbia.

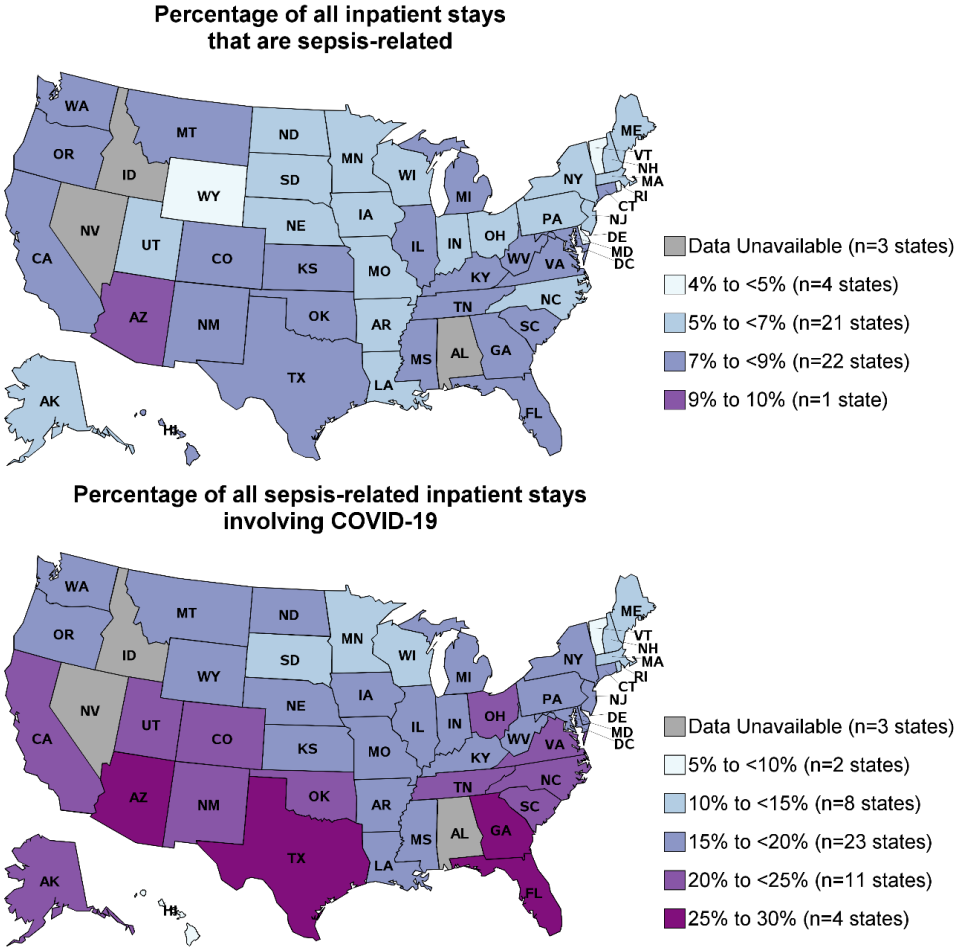
- In 2021, the population rate of sepsis-related inpatient stays (per 100,000 population) ranged from 433 to 1,089 across states.
  - Wyoming, Rhode Island, Vermont, Utah, and North Dakota had the lowest population rates of sepsis-related inpatient stays, ranging from 433 to 487, respectively.
  - Mississippi, Tennessee, Kentucky, Florida, and West Virginia, five states in the South, had the highest population rates, ranging from 881 to 1,089, respectively.
- In 2021, the population rate of sepsis-related inpatient stays involving COVID-19 (per 100,000 population) ranged from 31 to 250.

- Vermont, Hawaii, Rhode Island, Maine, and North Dakota had the lowest population rates, ranging from 31 to 76, respectively. Three of these five states (Vermont, Rhode Island, and Maine) are in New England.
- Georgia, Texas, West Virginia, Arizona, and Florida had the highest population rates, ranging from 194 to 250, respectively. Four of the five states with the highest population rates are in the South region of the United States.

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 2021. 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.

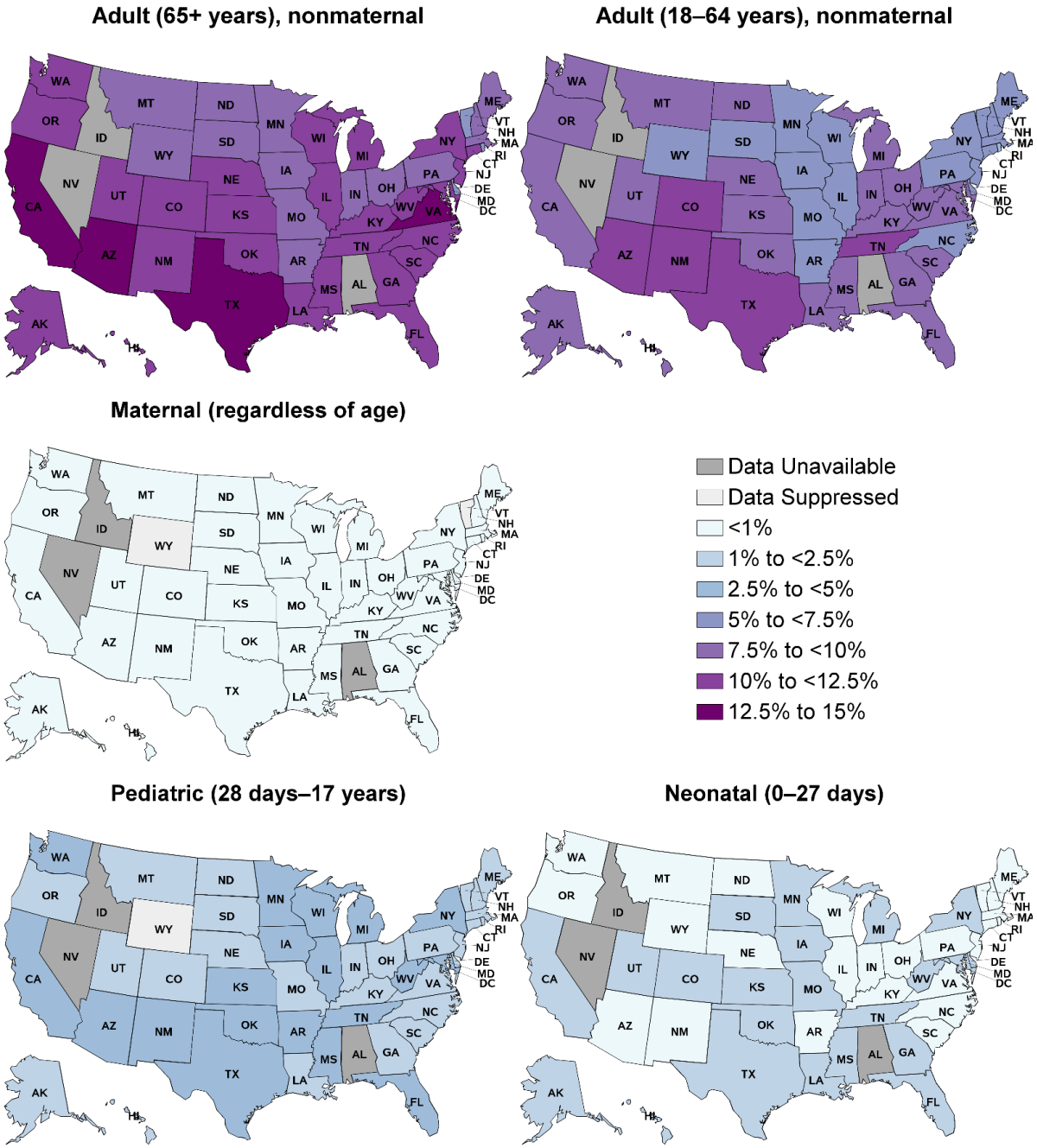
Figure 2. Percentage of inpatient stays related to sepsis, overall and involving COVID-19, 2021



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), 2021, 47 states and the District of Columbia.

- In 2021, the percentage of inpatient stays related to sepsis ranged from 4.2 percent in Rhode Island to 9.1 percent in Arizona.
- Among inpatient stays related to sepsis, the percentage involving COVID-19 ranged from 6.8 percent to 27.7 percent.
  - The lowest percentages of sepsis-related stays involving COVID-19 were in Vermont, Hawaii, Maine, the District of Columbia, and Rhode Island, with the percentage ranging from 6.8 percent in Vermont to 13.0 percent in the District of Columbia and Rhode Island. Three of these five states are in New England.
  - The highest percentages of sepsis-related stays involving COVID-19 were in New Mexico, Georgia, Florida, Texas, and Arizona ranging from 23.2 percent in New Mexico to 27.7 percent in Arizona. Of the ten states with the highest percentages, six are in the South region of the United States.

Figure 3. Percentage of inpatient stays related to sepsis by patient population, 2021

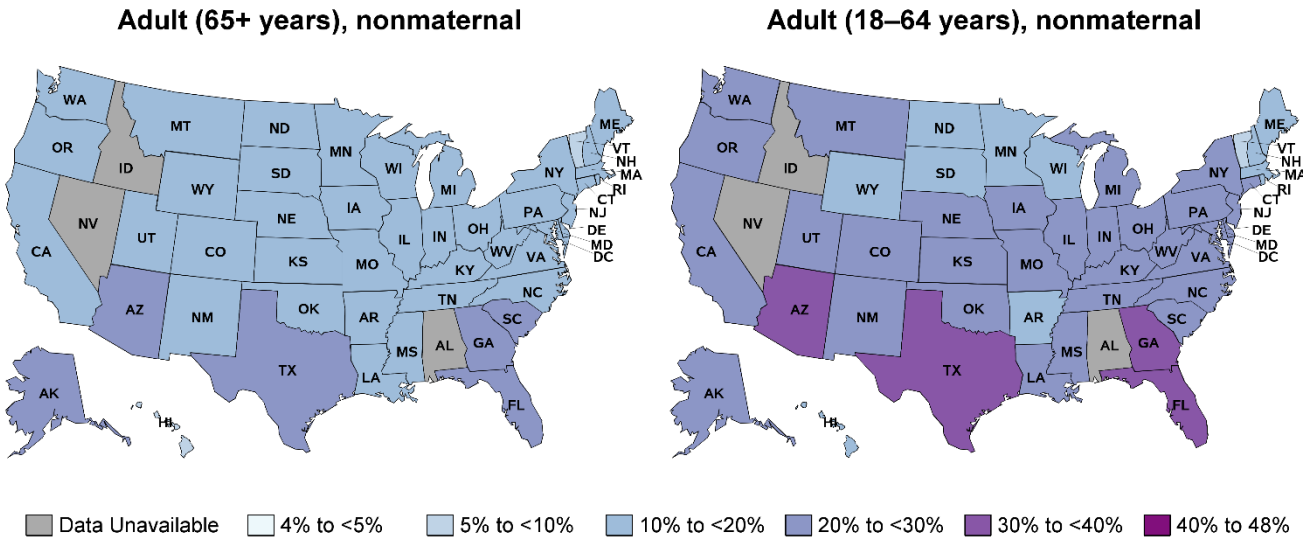


Note: The percentage of sepsis-related inpatient stays was based on any-listed diagnosis of sepsis. Data are suppressed for states with less than 11 sepsis-related inpatient stays.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2021, 47 states and the District of Columbia.

- State-level percentages of inpatient stays related to sepsis for the two nonmaternal adult patient populations ranged from 4 to 15 percent.
  - For nonmaternal adult patients aged 18–64 years, all but one state exceeded 5 percent and five states, all in the South or West, had 10 percent or more of their stays involving sepsis.
  - For nonmaternal adult patients aged 65 years and older, all but three states exceeded 7.5 percent and four states, all in the South or West, had 12.5 percent or more of their inpatient stays involve sepsis.
- Among both nonmaternal adult patient populations, states in the South and West had higher percentages of inpatient stays related to sepsis than states in the Midwest and Northeast.

- In 2021, the percentage of inpatient stays related to sepsis among maternal, neonatal, and pediatric patients was less than five percent for all states.
  - For the maternal patient population, these percentages were less than one percent for all states.
  - For the neonatal patient population, all states had percentages less than 2.5 percent.
  - For the pediatric patient population, all states had percentages less than 5 percent.

Figure 4. Percentage of sepsis-related inpatient stays involving COVID-19 by patient population, 2021



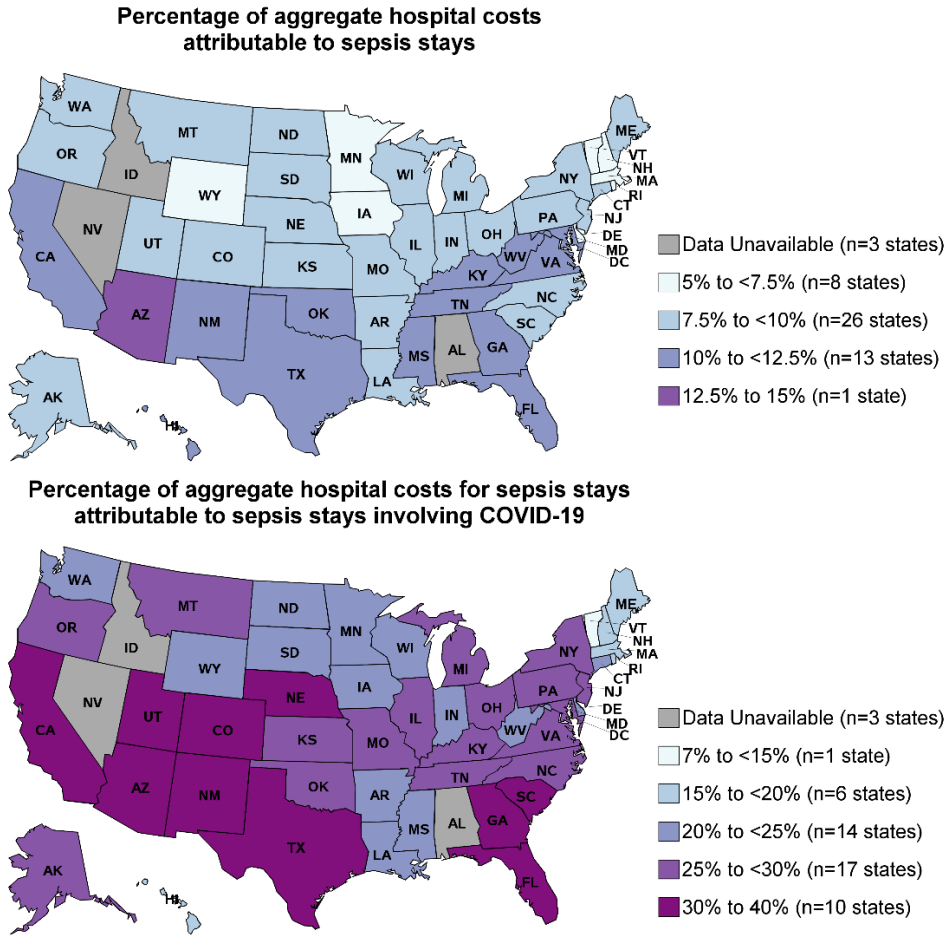
Note: The percentage of sepsis-related inpatient stays was based on any-listed diagnosis of sepsis. Maternal, pediatric, and neonatal patient population data are not reported due to small sample sizes in some states.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2021, 47 states and the District of Columbia.

- Among inpatient stays related to sepsis in 2021, the percentage of sepsis-related inpatient stays involving COVID-19 was highest among the nonmaternal adult patient population aged 18–64 years. Thirty-five states had a percentage of at least 20 percent.
- Vermont and Hawaii had the lowest percentages for both adult nonmaternal patient populations (nonmaternal adults aged 18–64 years, 9.0 and 14.6 percent, respectively, and nonmaternal adults aged 65 years and older, 5.7 and 6.7 percent, respectively).
- In 2021, for nonmaternal adults aged 18–64 and 65+ years, the highest percentages of sepsis-related inpatient stays involving COVID-19 were found in states in the South compared to states in other areas of the United States.

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 2021. 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, 2021



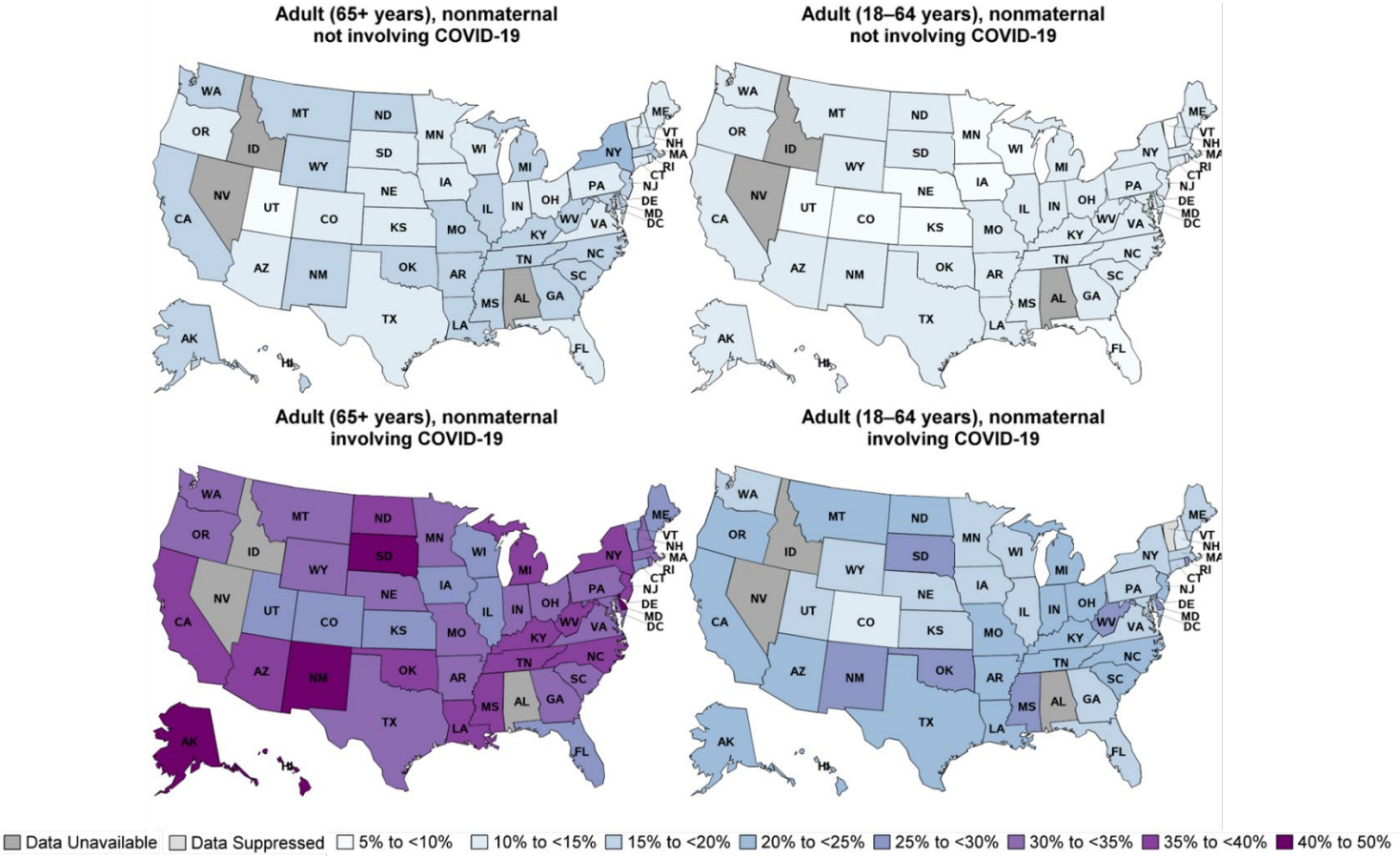
Note: Aggregate hospital cost was based on stays in which sepsis was the reason for the stay (i.e., principal diagnosis).
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases (SID), 2021, 47 states and the District of Columbia.

- In 2021, the percentage of total hospital costs attributable to sepsis stays ranged from 5.1 percent in Rhode Island to 12.8 percent in Arizona.
- The percentage of total sepsis hospital costs that were attributable to sepsis stays involving COVID-19 ranged from 7.3 to 38.9 percent.
  - The lowest percentages were in Vermont, Hawaii, District of Columbia, New Hampshire, and Maine with percentages ranging from 7.3 percent in Vermont to 17.8 percent in Maine.
  - The highest percentages were in Florida, Utah, New Mexico, Texas, and Arizona with percentages ranging from 34.4 percent in Florida to 38.9 percent in Arizona.
  - Forty-one states had at least 20 percent of their total sepsis hospital costs attributable to sepsis stays with COVID-19.
- Both the percentage of total hospital costs attributable to sepsis stays and the percentage of total sepsis hospital costs for sepsis stays with COVID-19 were higher in states in the South and West compared to the those in the Midwest and Northeast.

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 2021. 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, 2021



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), 2021, 47 states and the District of Columbia.

- Among nonmaternal adults aged 18–64 years in 2021:
  - The in-hospital mortality rate for sepsis stays not involving COVID-19 ranged from 8 per 100 sepsis stays to 16 per 100 sepsis stays.
  - The in-hospital mortality rate for sepsis stays involving COVID-19 was higher, ranging from 12 per 100 sepsis stays to 30 per 100 sepsis stays.
- Among nonmaternal adults aged 65 years and older:
  - The in-hospital morality rate for sepsis stays involving COVID-19 was at least 1.5 times greater than the rate for sepsis stays not involving COVID-19 in all states and the District of Columbia. Among the ten states with the greatest difference in rates, seven of these states were in the West.
  - The in-hospital mortality rate for sepsis stays not involving COVID-19 ranged from 9 per 100 sepsis stays in Utah to 23 per 100 sepsis stays the District of Columbia.
  - The in-hospital mortality rate for sepsis stays involving COVID-19 ranged from 25 per 100 sepsis stays in Kansas to 46 per 100 sepsis stays in Alaska.

References

[1] Singer M, Deutschman CS, Seymour CW et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). JAMA. 2016;315(8):801-810.

[2] Owens PL, Miller MA, Barrett ML, Hensche M. Overview of Outcomes for Inpatient Stays Involving Sepsis, 2016–2021. HCUP Statistical Brief #306. April 2024. Agency for Healthcare Research and Quality, Rockville, MD. https://hcup-us.ahrq.gov/reports/statbriefs/sb306-overview-sepsis-2016-2021.pdf.

[3] What is Sepsis? Centers of Disease Control and Prevention. https://www.cdc.gov/sepsis/index.html. Accessed January 23, 2024.

Data Source

This Statistical Brief uses data from the Healthcare Cost and Utilization Project (HCUP) 2021 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)

Population	Maternal	Age Criteria	Sepsis Criteria
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.

Identification of inpatient stays for COVID-19

The identification of inpatient stays related to COVID-19 was based on any of the following ICD-10-CM diagnoses:

- J1282, Pneumonia due to coronavirus disease 2019
- U071, COVID-19
- U099, Post COVID-19 condition, unspecified.

Definitions

Diagnoses

The *principal diagnosis* is the condition established after study to be chiefly responsible for the patient's admission to the hospital. *Secondary diagnoses* are conditions that coexist at the time of admission that require or affect patient care treatment or management or that develop during the inpatient stay. *All-listed diagnoses* include the principal diagnosis plus the secondary conditions.

ICD-10-CM Coding System

ICD-10-CM is the *International Classification of Diseases, Tenth Revision, Clinical Modification*.[a] There are over 70,000 ICD-10-CM diagnosis codes. In October 2015 (Fiscal Year 2016), ICD-10-CM replaced the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) diagnosis coding system for use with medical records.

[a]Center for Medicare and Medicaid Services. ICD-10-CM Official Guidelines for Coding and Reporting FY 2024. https://www.cms.gov/files/document/fy-2024-icd-10-cm-coding-guidelines.pdf. Accessed December 7, 2023.

Regions

Regions refer to U.S Census Bureau defined regions.[b] The Northeast region includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. The Midwest region includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. The South region includes Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. The West region includes Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Types of hospitals included in HCUP SID

This analysis used SID limited to data from community hospitals, which are defined as short-term, non-federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). Community hospitals include obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals are excluded from this analysis. However, if a patient received long-term care, rehabilitation, or treatment for a psychiatric or chemical dependency condition in a community hospital, the discharge record for that stay was included in the analysis.

Total hospital costs and charges

Total hospital charges were converted to costs using HCUP Cost-to-Charge Ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services (CMS).[c] *Costs* reflect the actual expenses incurred in the production of hospital services, such as wages, supplies, and utility costs. *Charges* represent the amount a hospital billed for the case. For each hospital, a hospital-wide cost-to-charge ratio is used. Hospital charges reflect the amount the hospital billed for the entire hospital stay and do not include professional (physician) fees. For this Statistical Brief, hospital costs are reported to the nearest hundred dollars. Further information on the HCUP Cost-to-Charge Ratio can be found at: https://hcup-us.ahrq.gov/db/ccr/costtocharge.jsp.

Calculations

State-specific rates of sepsis-related inpatient stays

The rates of inpatient stays related to sepsis were calculated using the following formula:

$$\text{Population rate} = \frac{\text{Number of inpatient stays related to sepsis among residents of the state}}{\text{Population in the state}} \times 100{,}000$$

Percentage of inpatient stays related to sepsis

The percentage of inpatient stays related to sepsis was calculated as follows:

- Numerator of total sepsis-related inpatient stays at hospitals within the state.
- Denominator of total inpatient stays at hospitals within the state.

The percentage of inpatient stays related to sepsis involving COVID-19 was calculated as follows:

- Numerator of total sepsis-related inpatient stays involving COVID-19 at hospitals within the state.
- Denominator of total sepsis-related inpatient stays at hospitals within the state.

For percentages by patient population, the numerator and denominator were limited to the specific population of interest.

---

[b]U.S. Census Bureau. Census Regions and Divisions of the United States. https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf . Accessed August 22, 2024.
[c]Agency for Healthcare Research and Quality. Cost-to-Charge Ratio Files. Healthcare Cost and Utilization Project (HCUP). Agency for Healthcare Research and Quality. Updated November 2021. www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed January 23, 2024.

Percentage of aggregate hospital costs

The percentage of aggregate hospital costs attributable to sepsis inpatient stays was calculated as follows:

- Numerator of aggregate hospital costs for sepsis stays at hospitals within the state.
- Denominator of aggregate hospital costs for inpatient stays at hospitals within the state.

The percentage of aggregate hospital costs of sepsis stays attributable to sepsis stays involving COVID-19 was calculated as follows:

- Numerator of aggregate hospital costs for sepsis stays involving COVID-19 at hospitals within the state.
- Denominator of aggregate hospital costs for all sepsis stays at hospitals within the state.

Imputation of missing charges and hospital costs

Missing charges were imputed using the average total hospital charges for the Diagnosis Related Group (DRG) calculated using the SID for the same state-data year. The imputation of total hospital charges occurred prior to the calculation of total hospital costs. The imputation of missing charges and the calculation of hospital costs were performed per discharge prior to the calculation of aggregate hospital costs within each state.

In-hospital mortality rate

The in-hospital mortality rate per 100 sepsis stays not involving COVID-19 was calculated as follows:

- Numerator of sepsis stays not involving COVID-19 at hospitals within the state in which the patient died in the hospital.
- Denominator of sepsis stays not involving COVID-19 (any discharge status) at hospitals within the state.

The in-hospital mortality rate per 100 sepsis stays involving COVID-19 was calculated as follows:

- Numerator of sepsis stays involving COVID-19 at hospitals within the state in which the patient died in the hospital.
- Denominator of sepsis stays involving COVID-19 (any discharge status) at hospitals within the state.

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of healthcare databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of state data organizations, hospital associations, and private data organizations (HCUP Partners) and the Federal government to create a national information resource of encounter-level healthcare data. HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to healthcare programs, and outcomes of treatments at the national, State, and local market levels. For more information about HCUP, see: https://hcup-us.ahrq.gov/

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Alaska Department of Health
Alaska Hospital and Healthcare Association
Arizona Department of Health Services
Arkansas Department of Health
California Department of Health Care Access and Information
Colorado Hospital Association
Connecticut Hospital Association
Delaware Division of Public Health
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Laulima Data Alliance
Hawaii University of Hawai'i at Hilo
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi State Department of Health
Missouri Hospital Industry Data Institute
Montana Hospital Association
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Health Authority
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Revenue and Fiscal Affairs Office
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Department of Health and Human Resources
Wisconsin Department of Health Services
Wyoming Hospital Association

Suggested Citation

Roemer M, Zodet M, Esselman D, Sheng M. State Variation in Inpatient Stays Involving Sepsis, 2021. HCUP Statistical Brief #310. September 2024. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/reports/statbriefs/sb310-state-variation-sepsis-2021.pdf.

Acknowledgments

The authors would like to acknowledge the contributions of Sai Loganathan, Molly Hensche, Juliana Rev, and Lilian Huang of NORC at the University of Chicago, Marguerite Barrett of ML Barrett, Inc, and the clinical team at University of California, Davis.

* * *

For More Information

For more information on this and other topics, please visit our HCUP Statistical Briefs topic area page located at www.hcup-us.ahrq.gov/reports/statbriefs/sbtopic.jsp.

For additional HCUP statistics, visit:

- HCUP Fast Stats at https://datatools.ahrq.gov/hcup-fast-stats for easy access to the latest HCUP-based statistics for healthcare information topics
- HCUPnet, HCUP's interactive query system, at https://datatools.ahrq.gov/hcupnet
- HCUP Summary Trend Tables at www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp for monthly information on hospital utilization

AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of healthcare in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please email us at hcup@ahrq.gov or send a letter to the address below:

Craig A. Umscheid, M.D., M.S., Director
Center for Quality Improvement and Patient Safety (CQuIPS)
Agency for Healthcare Research and Quality (AHRQ)
5600 Fishers Lane
Rockville, MD 20857

Pamela L Owens, Ph.D., Director
Division of Healthcare Data and Analytics (DHDA)
Center for Quality Improvement and Patient Safety (CQuIPS)
Agency for Healthcare Research and Quality (AHRQ)
5600 Fishers Lane
Rockville, MD 20857

This Statistical Brief was posted online on September 13, 2024.