

# Changes in Pediatric Hospitalizations and In-Hospital Deaths in the Initial Period of the COVID-19 Pandemic (April–September 2020), 13 States

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## Introduction

Annually, there are approximately 5.3 million pediatric hospitalizations in the United States, including for births and neonatal conditions (71 percent), medical conditions (18 percent), surgeries (5 percent), mental health and substance use conditions (3 percent), injuries (2 percent), and maternal conditions (1 percent).<sup>1</sup> With the COVID-19 pandemic beginning in early 2020, hospital utilization changed considerably, as areas of the country saw spikes in COVID-19 cases and subsequent hospitalizations. Hospitalizations related to COVID-19 varied by State and across time.<sup>2</sup> State-level reports compiled by the American Academy of Pediatrics and the Children’s Hospital Association show pediatric COVID-19 cases and hospitalizations were infrequent at the beginning of the pandemic.<sup>3</sup> Little is known, however, about the impact of the early period of the pandemic on pediatric hospitalizations and in-hospital deaths overall.

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data from 13 States on pediatric hospitalizations prior to (April–September 2016–2019) and at the beginning of (April–September 2020) the pandemic. Specifically, this Brief compares pediatric hospitalization statistics from April to September 2020 with the average in April–September 2016–2019 for 13 States. The number of hospitalizations and in-hospital deaths for patients aged less than 18 years is presented overall and by patient characteristics across 13 States using quarterly HCUP inpatient data and the HCUP State Inpatient Databases (SID). The percentages of all pediatric hospitalizations related to COVID-19 during the April–September 2020 timeframe are also provided. Because of the large sample size of the HCUP data, small differences can be statistically significant but not meaningful. Thus, only differences greater than or equal to 10 percent are discussed in the text.

This analysis is limited to discharges for pediatric patients treated in community, nonrehabilitation hospitals in 13 States (Colorado, Georgia, Iowa, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Jersey, Ohio, South Carolina, and Vermont) for which HCUP data were available for April–September 2016–2019 and April–September 2020. These States account for 24.7 percent of the resident U.S. population in 2019.<sup>4,5</sup> Information contained in this Statistical Brief was primarily obtained from the [HCUP Summary Trend Tables](#).<sup>6</sup> The Summary Trend Tables, accessed as downloadable tables, provide State-specific monthly trends in hospital utilization for

## Highlights

- Across 13 States, the average number of pediatric hospitalizations and in-hospital deaths decreased 17 and 11 percent to about 20,000 hospitalizations and 80 deaths in the first 3 months of the pandemic (April–June 2020) compared with the same months in previous years.
- In April–September 2020, the percentage of pediatric hospitalizations and in-hospital deaths related to COVID-19 was 0.4 and 0.6 percent, respectively.
- Across patient characteristics examined, the percentage of pediatric hospitalizations related to COVID-19 was highest for Hispanic children (1.0 percent) in 13 States from April to September 2020.
- The largest decrease in pediatric hospitalizations in April–September 2020 compared with the same months in previous years was observed for non-Hispanic Black patients (18 percent decrease) and those with an expected payer of Medicaid (17 percent decrease), across patient characteristics examined in 13 States.
- The largest decrease in pediatric in-hospital deaths in April–September 2020 compared with the same months in 2016–2019 was observed for Hispanic patients (24 percent decrease) and patients from high-income areas (23 percent decrease).

the most recent HCUP data available. These tables were also used to create the [HCUP Visualization of Inpatient Trends in COVID-19 and Other Conditions](#)<sup>7</sup> and will be updated as more quarterly data become available.

## Findings

### *State-level pediatric hospitalizations and in-hospital deaths, 2016–2019 and 2020*

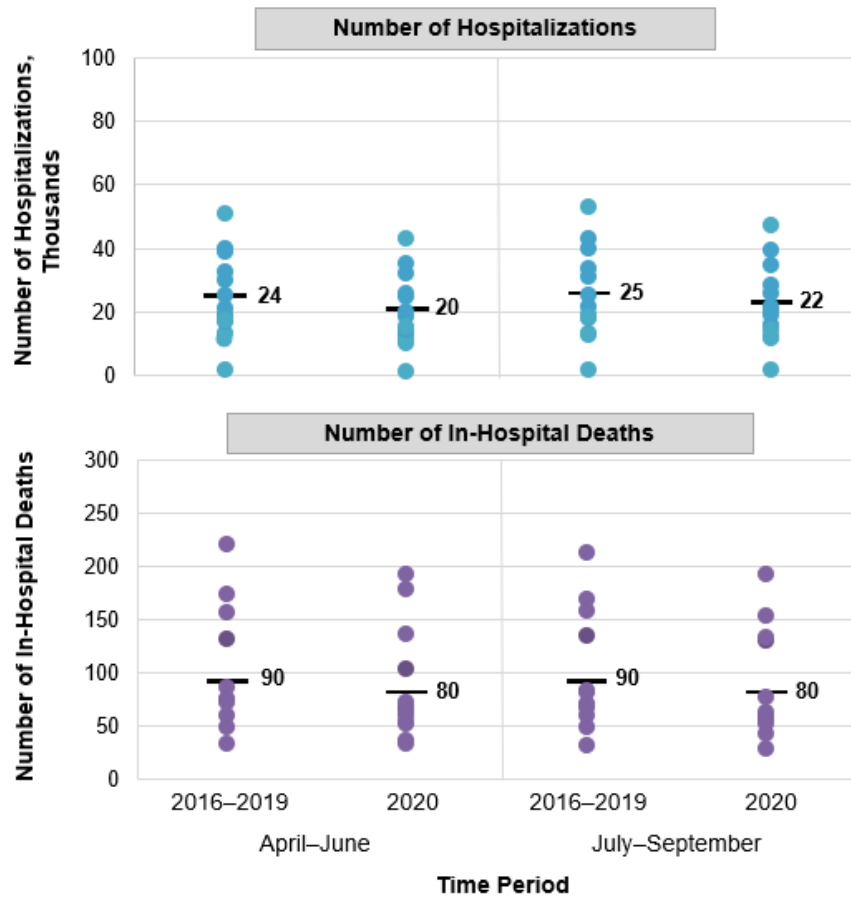
Figure 1 displays the number of hospitalizations and in-hospital deaths among patients aged less than 18 years for each of the 13 States in April–September 2016–2019 and 2020. Each dot in the figure represents the State-specific number of hospitalizations or in-hospital deaths. The average number of hospitalizations and in-hospital deaths across these 13 States is also presented.

- On average, the *number of all pediatric hospitalizations* in the 13 States examined decreased 16.7 and 12.0 percent in the second (April–June; about 24,000 to 20,000 hospitalizations) and third (July–September; about 25,000 to 22,000 hospitalizations) quarters of 2020 compared with the same quarters in 2016–2019, respectively.<sup>a</sup>
- On average, the *number of pediatric all-cause in-hospital deaths* across the 13 States examined decreased 11.1 percent (from 90 to 80 deaths) in the second (April–June) and third (July–September) quarters of 2020 compared with the same quarters in 2016–2019.

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<sup>a</sup> Hospitalizations include newborns, infants, and children aged 1–17 years. Nationally, in 2016–2018, approximately 77 percent of hospitalizations were for infants (including newborns and infants hospitalized within the first year of birth), and 23 percent were for children aged 1–17 years. Source: Agency for Healthcare Research and Quality. HCUPnet. Healthcare Cost and Utilization Project (HCUP). <https://hcupnet.ahrq.gov/>.

**Figure 1. Number of hospitalizations (in thousands) and in-hospital deaths among patients aged less than 18 years in April–September 2020 compared with the average of April–September 2016–2019, by quarter, 13 States**



Notes: Number of in-hospital deaths is rounded to the nearest ten. Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–September across these 4 years. Data values are suppressed for counts <11.  
 Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), 2016–2019 State Inpatient Databases (SID) and 2020 quarterly data from 13 States (CO, GA, IA, KY, MD, MI, MN, MO, MS, NJ, OH, SC, and VT) (available as of March 2021)

Figure 2 presents the number of hospitalizations and in-hospital deaths for patients aged less than 18 years by State, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of pediatric hospitalizations related to COVID-19 in April–September 2020 is also presented. States are listed in alphabetical order within U.S. census regions.

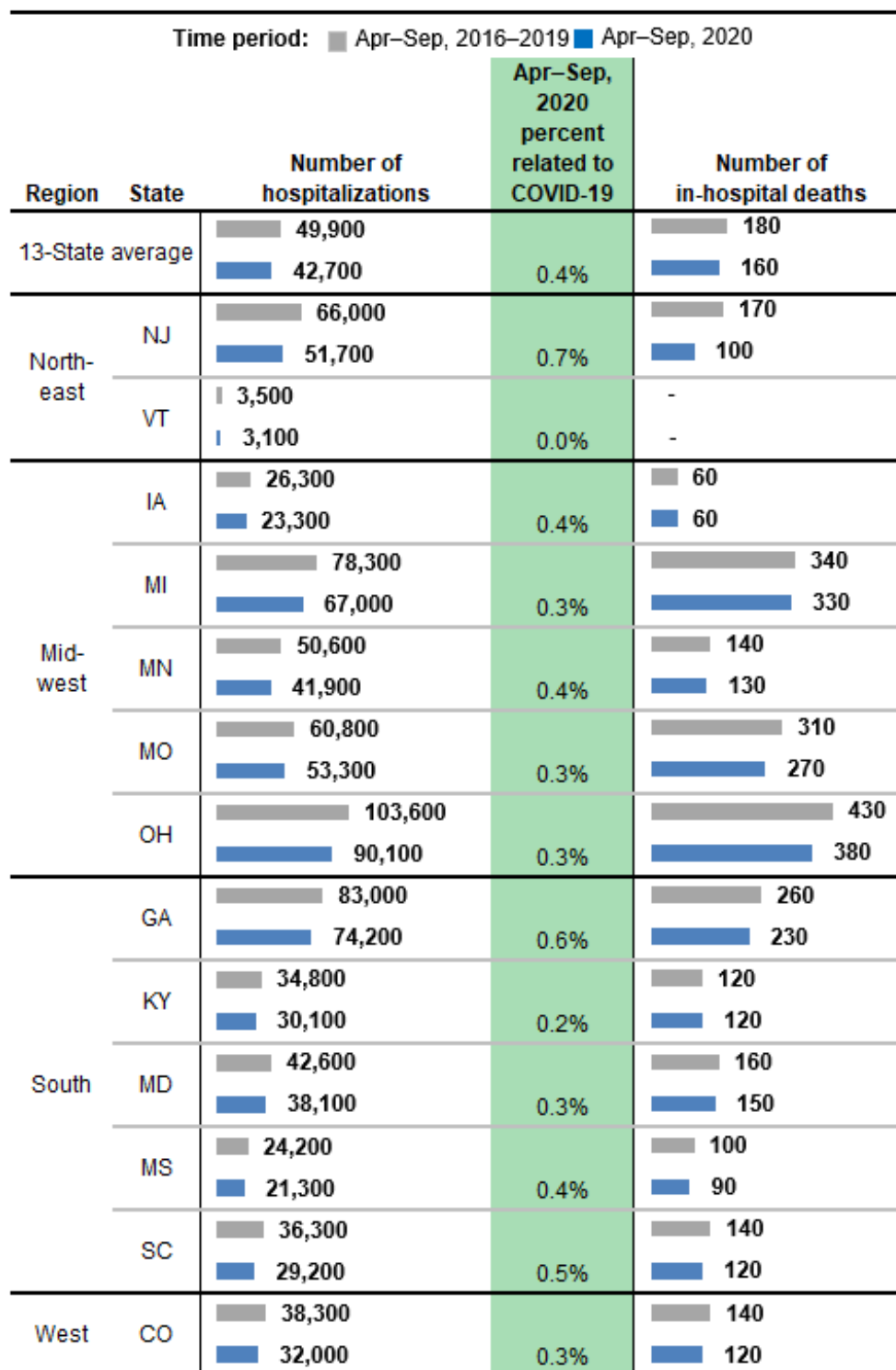
- The *number of all pediatric hospitalizations* decreased 14 percent, on average, in April–September 2020 compared with the average in April–September 2016–2019 for all 13 States examined. New Jersey had the largest decrease of 21.7 percent fewer hospitalizations (from 66,000 to 51,700 hospitalizations), while Georgia and Maryland had the smallest decrease of 10.6 percent (from 83,000 to 74,200 and from 42,600 to 38,100 hospitalizations, respectively).

On average across 13 States, the percentage of all pediatric hospitalizations related to COVID-19 was low at 0.4 percent in April–September 2020, ranging from 0 percent in Vermont to 0.7 percent in New Jersey.

- The *number of pediatric all-cause in-hospital deaths* in April–September 2020 versus the average in April–September 2016–2019 was unchanged or decreased for each of the 13 States examined. The decrease was largest in New Jersey, where the number of pediatric in-hospital deaths decreased by nearly half (41.2 percent; from 170 to 100 deaths).

The percentage of all-cause pediatric in-hospital deaths related to COVID-19 was 0.6 percent, on average across 13 states (data not shown). Given this low frequency of pediatric in-hospital deaths overall, further data on pediatric in-hospital deaths related to COVID-19 by patient characteristics are not provided.

**Figure 2. Number of hospitalizations, in-hospital deaths, and percentage of hospitalizations related to COVID-19 among patients aged less than 18 years in April–September 2020 compared with the average of all hospitalizations in April–September 2016–2019, 13 States**



Notes: Number of hospitalizations is rounded to the nearest hundred, and number of in-hospital deaths is rounded to the nearest ten. Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–September across these 4 years. Data values and calculations are suppressed for counts <11.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), 2016–2019 State Inpatient Databases (SID) and 2020 quarterly data from 13 States (CO, GA, IA, KY, MD, MI, MN, MO, MS, NJ, OH, SC, and VT) (available as of March 2021)

*Patient characteristics associated with pediatric hospitalizations and in-hospital deaths, 2016–2019 and 2020*

Figure 3 presents the number of hospitalizations and in-hospital deaths for patients aged less than 18 years in 13 States combined by location of patient residence (large metro, medium/small metro, and rural), comparing April–September 2020 with the average from April–September 2016–2019. The percentage of pediatric hospitalizations related to COVID-19 in April–September 2020 is also presented.

- The *number of all pediatric hospitalizations* decreased approximately 14 percent in April–September 2020 compared with the average in April–September 2016–2019 in all three patient locations across 13 States.

In the beginning of the pandemic and across the 13 States with available data, the percentage of hospitalizations related to COVID-19 was similar across patient locations (0.3 to 0.5 percent).

- The *number of pediatric all-cause in-hospital deaths* decreased about 14 percent each for patients from large metropolitan (metro) areas (1,200 to 1,030 deaths) and medium/small metro areas (700 to 600 deaths) in April–September 2020 versus the average in April–September 2016–2019.

**Figure 3. Number of hospitalizations, in-hospital deaths, and percentage of hospitalizations related to COVID-19 among patients aged less than 18 years by location of patient residence in April–September 2020 compared with the average of all hospitalizations in April–September 2016–2019, 13 States**

Patient location	Time period	Number of hospitalizations	Apr–Sep, 2020 percent related to COVID-19	Number of in-hospital deaths
Large metro	Apr–Sep, 2016–2019	346,400		1,200
	Apr–Sep, 2020	295,100	0.5%	1,030
Medium/ small metro	Apr–Sep, 2016–2019	181,100		700
	Apr–Sep, 2020	156,600	0.3%	600
Rural	Apr–Sep, 2016–2019	119,900		480
	Apr–Sep, 2020	103,200	0.3%	450

Notes: Number of hospitalizations is rounded to the nearest hundred, and number of in-hospital deaths is rounded to the nearest ten. Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–September across these 4 years.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), 2016–2019 State Inpatient Databases (SID) and 2020 quarterly data from 13 States (CO, GA, IA, KY, MD, MI, MN, MO, MS, NJ, OH, SC, and VT) (available as of March 2021)

Figure 4 presents the number of hospitalizations and in-hospital deaths for patients aged less than 18 years in 13 States combined by patient race/ethnicity, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of pediatric hospitalizations related to COVID-19 in April–September 2020 is also presented.

- The *number of all pediatric hospitalizations* decreased in April–September 2020 versus the average in April–September 2016–2019 for all race/ethnicity groups. The largest decrease (18.1 percent) was for non-Hispanic Black pediatric patients (122,400 to 100,300 hospitalizations), while Hispanic pediatric patients had the smallest decrease (12.5 percent; 54,600 to 47,800 hospitalizations).

In April–September 2020, the percentage of all pediatric hospitalizations related to COVID-19 was highest for Hispanic patients (1.0 percent).

- The *number of pediatric all-cause in-hospital deaths* decreased in April–September 2020 versus the average in April–September 2016–2019 for all race/ethnicity groups, ranging from an 11.8 percent decrease for pediatric patients in the non-Hispanic other category (170 to 150 deaths) to a 23.5 percent decrease for Hispanic pediatric patients (170 to 130 deaths).

**Figure 4. Number of hospitalizations, in-hospital deaths, and percentage of hospitalizations related to COVID-19 among patients aged less than 18 years by patient race/ethnicity in April–September 2020 compared with the average of all hospitalizations in April–September 2016–2019, 13 States**

Patient race/ethnicity	Time period	Number of hospitalizations	Apr–Sep, 2020 percent related to COVID-19	Number of in-hospital deaths
White NH	Apr–Sep, 2016–2019	348,800		1,030
	Apr–Sep, 2020	290,000	0.2%	850
Black NH	Apr–Sep, 2016–2019	122,400		690
	Apr–Sep, 2020	100,300	0.6%	590
Hispanic	Apr–Sep, 2016–2019	54,600		170
	Apr–Sep, 2020	47,800	1.0%	130
Other NH	Apr–Sep, 2016–2019	47,700		170
	Apr–Sep, 2020	39,800	0.4%	150

Abbreviation: NH, non-Hispanic

Notes: Number of hospitalizations is rounded to the nearest hundred, and number of in-hospital deaths is rounded to the nearest ten. Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–September across these 4 years.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), 2016–2019 State Inpatient Databases (SID) and 2020 quarterly data from 13 States (CO, GA, IA, KY, MD, MI, MN, MO, MS, NJ, OH, SC, and VT) (available as of March 2021)

Figure 5 presents the number of hospitalizations and in-hospital deaths for patients aged less than 18 years in 13 States combined by primary expected payer, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of pediatric hospitalizations related to COVID-19 in April–September 2020 is also presented.

- The *number of all pediatric hospitalizations* decreased in April–September 2020 versus the average in April–September 2016–2019 for all expected payers except self-pay/no charge (which was unchanged), ranging from a 13.1 percent decrease for private insurance (294,600 to 255,900 hospitalizations) to a 16.7 percent decrease for Medicaid (from 299,500 to 249,600 hospitalizations).

In April–September 2020, 0.6 percent of all pediatric hospitalizations with Medicaid as the expected payer were related to COVID-19.

- The *number of pediatric all-cause in-hospital deaths* decreased in April–September 2020 versus the average in April–September 2016–2019 for all expected payers except self-pay/no charge. The decrease was largest (18.3 percent) for private insurance as the expected payer (820 to 670 deaths).

**Figure 5. Number of hospitalizations, in-hospital deaths, and percentage of hospitalizations related to COVID-19 among patients aged less than 18 years by primary expected payer in April–September 2020 compared with the average of all hospitalizations in April–September 2016–2019, 13 States**

Primary expected payer	Time period	Number of hospitalizations	Apr–Sep, 2020 percent related to COVID-19	Number of in-hospital deaths
Private insurance	Apr–Sep, 2016–2019	294,600		820
	Apr–Sep, 2020	255,900	0.2%	670
Medicaid	Apr–Sep, 2016–2019	299,500		1,240
	Apr–Sep, 2020	249,600	0.6%	1,110
Self-pay/ No charge*	Apr–Sep, 2016–2019	29,600		220
	Apr–Sep, 2020	29,600	0.3%	230

Notes: Number of hospitalizations is rounded to the nearest hundred, and number of in-hospital deaths is rounded to the nearest ten. Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–September across these 4 years. Statistics on hospitalizations with an expected payer of Medicare are not shown because there are not enough data to present this group.

\* Self-pay/No charge: includes self-pay, no charge, charity, and no expected payment.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), 2016–2019 State Inpatient Databases (SID) and 2020 quarterly data from 13 States (CO, GA, IA, KY, MD, MI, MN, MO, MS, NJ, OH, SC, and VT) (available as of March 2021)



Figure 6 presents the number of hospitalizations and in-hospital deaths for patients aged less than 18 years in 13 States combined by community-level income, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of all pediatric hospitalizations related to COVID-19 in April–September 2020 is also presented.

- The *number of all-cause pediatric hospitalizations* decreased 15.2 percent in April–September 2020 versus the average in April–September 2016–2019 for patients from the lowest income quartile (193,500 to 164,000 hospitalizations). This was the largest decrease among the income categories. In April–September 2020, the percentage of all-cause pediatric hospitalizations related to COVID-19 was highest (0.5 percent) among hospitalizations for patients residing in the lowest income quartiles.
- The *number of pediatric all-cause in-hospital deaths* decreased in April–September 2020 versus the average in April–September 2016–2019 for all income quartiles. The decrease was largest in the highest income quartile (22.9 percent; 350 to 270 deaths).

**Figure 6. Number of hospitalizations, in-hospital deaths, and percentage of hospitalizations related to COVID-19 among patients aged less than 18 years by community-level income in April–September 2020 compared with the average of all hospitalizations in April–September 2016–2019, 13 States**

Community-level income	Time period	Number of hospitalizations	Apr–Sep, 2020 percent related to COVID-19	Number of in-hospital deaths
Lowest (Q1)	Apr–Sep, 2016–2019	193,500		890
	Apr–Sep, 2020	164,000	0.5%	830
Middle (Q2–Q3)	Apr–Sep, 2016–2019	317,000		1,130
	Apr–Sep, 2020	274,100	0.4%	960
Highest (Q4)	Apr–Sep, 2016–2019	134,000		350
	Apr–Sep, 2020	114,700	0.2%	270

Abbreviation: Q, quartile

Notes: Number of hospitalizations is rounded to the nearest hundred, and number of in-hospital deaths is rounded to the nearest ten. Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–September across these 4 years. Quartile is based on the national distribution of community-level income.

Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), 2016–2019 State Inpatient Databases (SID) and 2020 quarterly data from 13 States (CO, GA, IA, KY, MD, MI, MN, MO, MS, NJ, OH, SC, and VT) (available as of March 2021)

## References

- <sup>1</sup> Agency for Healthcare Research and Quality. HCUPnet. Healthcare Cost and Utilization Project (HCUP). [www.hcupnet.ahrq.gov/](http://www.hcupnet.ahrq.gov/). Accessed August 27, 2021.
- <sup>2</sup> Healthcare Cost and Utilization Project (HCUP) Statistical Briefs Series on COVID-19-Related Hospitalizations in 13 States (HCUP Statistical Briefs #273–276). June 2021. Agency for Healthcare Research and Quality, Rockville, MD. [www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp](http://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp). Accessed August 29, 2021.
- <sup>3</sup> American Academy of Pediatrics. Children and COVID-19: State-Level Data Report. Updated August 23, 2021. [www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/children-and-covid-19-state-level-data-report/](http://www.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/children-and-covid-19-state-level-data-report/). Accessed August 27, 2021.
- <sup>4</sup> U.S. Census Bureau, Population Division. Annual Estimates of the Resident Population by Sex, Race, and Hispanic Origin for the United States: April 1, 2010 to July 1, 2019 (NC-EST2019-SR11H). June 2020. [www.census.gov/newsroom/press-kits/2020/population-estimates-detailed.html](http://www.census.gov/newsroom/press-kits/2020/population-estimates-detailed.html). Accessed July 26, 2021.
- <sup>5</sup> U.S. Census Bureau, Population Division. Annual Estimates of the Resident Population by Sex, Race, and Hispanic Origin for Colorado, Georgia, Iowa, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Jersey, Ohio, South Carolina, and Vermont: April 1, 2010 to July 1, 2019 (NC-EST2019-SR11H-nn). June 2020. [www.census.gov/data/tables/time-series/demo/popest/2010s-state-detail.html](http://www.census.gov/data/tables/time-series/demo/popest/2010s-state-detail.html). Accessed July 26, 2021.
- <sup>6</sup> Agency for Healthcare Research and Quality. HCUP Summary Trend Tables. Healthcare Cost and Utilization Project (HCUP). Updated December 2020. [www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp](http://www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp). Accessed February 10, 2021.
- <sup>7</sup> Agency for Healthcare Research and Quality. HCUP Visualization of Inpatient Trends in COVID-19 and Other Conditions. Healthcare Cost and Utilization Project (HCUP). June 2021. [www.hcup-us.ahrq.gov/datavisualizations/covid-19-inpatient-trends.jsp](http://www.hcup-us.ahrq.gov/datavisualizations/covid-19-inpatient-trends.jsp). Accessed July 26, 2021.

## About Statistical Briefs

Healthcare Cost and Utilization Project (HCUP) Statistical Briefs provide basic descriptive statistics on a variety of topics using HCUP administrative healthcare data. Topics include hospital inpatient, ambulatory surgery, and emergency department use and costs, quality of care, access to care, medical conditions, procedures, and patient populations, among other topics. The reports are intended to generate hypotheses that can be further explored in other research; the reports are not designed to answer in-depth research questions using multivariate methods.

## Data Source

The estimates in this Statistical Brief are based upon data from the HCUP 2016–2019 State Inpatient Databases (SID) and 2020 quarterly inpatient data. Information based on quarterly data should be considered preliminary, as additional quarterly data may become available over time. This analysis is limited to patients treated in community, nonrehabilitation hospitals in 13 States (Colorado, Georgia, Iowa, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Jersey, Ohio, South Carolina, and Vermont) for which HCUP data were available for April–September 2016–2019 and April–September 2020. These States account for the following percentages of the resident U.S. population: 24.7 percent of the total population, 28.0 percent of the non-Hispanic White population, 32.7 percent of the non-Hispanic Black population, 11.9 percent of the Hispanic population, and 18.0 percent of the other non-Hispanic population, including but not limited to American Indian, Alaska Native, Asian, Native Hawaiian, and other Pacific Islander.<sup>1,2</sup> All of the information for 2020 contained in this Statistical Brief can be found in the HCUP Summary Trend Tables at [www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp](http://www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp).

The HCUP inpatient data contain the universe of the inpatient discharge abstracts in the participating HCUP States, translated into a uniform format to facilitate multistate comparisons and analyses. The inpatient data encompass more than 95 percent of all U.S. community hospital discharges. The inpatient data can be used to investigate questions unique to one State, to compare data from two or more States, to conduct market-area variation analyses, and to identify State-specific trends in inpatient care utilization, access, charges, and outcomes.

### *Types of hospitals included in HCUP State Inpatient Databases (and quarterly inpatient data)*

This analysis used SID and quarterly inpatient data limited to information 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 center hospitals. Excluded for this analysis are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. 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.

## Definitions

### *Diagnoses and ICD-10-CM*

The *principal diagnosis* is that 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 received or management, or that develop during the inpatient stay. *All-listed diagnoses* include the principal diagnosis plus the secondary conditions.

ICD-10-CM is the International Classification of Diseases, Tenth Revision, Clinical Modification. There are over 70,000 ICD-10-CM diagnosis codes.

### *Case definition*

COVID-19-related hospitalizations are identified by any-listed ICD-10-CM code of U07.1 (2019 novel coronavirus disease) on the discharge record. Per coding guidelines,<sup>b</sup> the use of U07.1 is based on documentation by the provider or documentation of a positive COVID-19 test result. The ICD-10-CM code for COVID-19 was implemented beginning April 1, 2020. As such, there may be some measurement error in the identification of cases.

### *Unit of analysis*

The unit of analysis is the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is admitted to the hospital multiple times in 1 year will be counted each time as a separate discharge from the hospital.

### *Location of patients' residence*

Place of residence is based on the urban-rural classification scheme for U.S. counties developed by the National Center for Health Statistics (NCHS) and based on the Office of Management and Budget (OMB) definition of a metropolitan service area as including a city and a population of at least 50,000 residents. For this Statistical Brief, we collapsed the NCHS codes into the following three categories:

Large metropolitan (metro) area:

- Large Central Metropolitan: Counties in a metropolitan area with 1 million or more residents that satisfy at least one of the following criteria: (1) containing the entire population of the largest principal city of the metropolitan statistical area (MSA), (2) having their entire population contained within the largest principal city of the MSA, or (3) containing at least 250,000 residents of any principal city in the MSA
- Large Fringe Metropolitan: Counties in a metropolitan area with 1 million or more residents that do not qualify as large central metropolitan counties

Medium/small metro area:

- Medium Metropolitan: Counties in a metropolitan area of 250,000–999,999 residents
- Small Metropolitan: Counties in a metropolitan area of 50,000–249,999 residents

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<sup>b</sup> Centers for Disease Control and Prevention, National Center for Health Statistics. ICD-10-C Official Guidelines for Coding and Reporting FY 2021 (October 1, 2020 - September 30, 2021). [www.cdc.gov/nchs/data/icd/10cmguidelines-FY2021.pdf](http://www.cdc.gov/nchs/data/icd/10cmguidelines-FY2021.pdf). Accessed March 18, 2021.

Rural area:

- Micropolitan: Counties in a nonmetropolitan area of 10,000–49,999 residents
- Noncore: Counties in a nonmetropolitan and nonmicropolitan area

#### *Reporting of race and ethnicity*

Data on Hispanic ethnicity are collected differently among the States and also can differ from the census methodology of collecting information on race (White, Black, Asian/Pacific Islander, American Indian/Alaska Native, Other [including mixed race]) separately from ethnicity (Hispanic, non-Hispanic). State data organizations often collect Hispanic ethnicity as one of several categories that include race. Therefore, for multistate analyses, HCUP creates the combined categorization of race and ethnicity for data from States that report ethnicity separately. When a State data organization collects Hispanic ethnicity separately from race, HCUP uses Hispanic ethnicity to override any other race category to create a Hispanic category for the uniformly coded race/ethnicity data element, while also retaining the original race and ethnicity data. This Statistical Brief reports race/ethnicity for the following categories: Hispanic, non-Hispanic White, non-Hispanic Black, and non-Hispanic Other (Asian/Pacific Islander, American Indian/Alaska Native, Other).

#### *Expected payer*

To make coding uniform across all HCUP data sources, the primary expected payer for the hospital stay combines detailed categories into general groups:

- Medicare: includes fee-for-service and managed care Medicare
- Medicaid: includes fee-for-service and managed care Medicaid
- Private insurance: includes commercial nongovernmental payers, regardless of the type of plan (e.g., private health maintenance organizations [HMOs], preferred provider organizations [PPOs])
- Self-pay/No charge: includes self-pay, no charge, charity, and no expected payment
- Other payers: includes other Federal and local government programs (e.g., TRICARE, CHAMPVA, Indian Health Service, Black Lung, Title V) and Workers' Compensation

Due to variability in coding in “other” payer by State (from 1.6 to 7.4 percent) and difficulty with interpretation, estimates of “other” expected payers were excluded from the Statistical Brief. Less than 0.01 percent of discharges were missing information on expected payer.

Prior to 2017, hospital stays that were expected to be billed to the State Children’s Health Insurance Program (SCHIP) may be classified as Medicaid or Other, depending on the structure of the State program. Because most State data do not identify SCHIP as a separate expected payer, it is not possible to present this information separately. Beginning with 2017 data, hospital stays that were expected to be billed to SCHIP are included under Medicaid.

For this Statistical Brief, when more than one payer is listed for a hospital discharge, the first-listed payer is used.

#### *Community-level income*

Community-level income is based on the median household income of the patient’s ZIP Code of residence. Quartiles are defined so that the total U.S. population is evenly distributed. Cut-offs for the quartiles are determined annually using ZIP Code demographic data obtained from Claritas, a vendor that produces population estimates and projections based on data from the U.S. Census Bureau.<sup>o</sup> The value ranges for the income quartiles vary by year. Patients in the first quartile are designated as having the *lowest* income, patients in the middle two quartiles are designated as having *middle* income, and patients in the highest quartile are designated as having the *highest* income. The income quartile is missing for patients who are homeless or foreign.

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<sup>o</sup> Claritas. Claritas Demographic Profile by ZIP Code. [claritas360.claritas.com/mybestsegments/](https://claritas360.claritas.com/mybestsegments/). Accessed June 27, 2021.

## 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.

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

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

## For More Information

For information on COVID-19 resources at AHRQ, refer to the AHRQ COVID-19 Resources page: [www.ahrq.gov/coronavirus/index.html](http://www.ahrq.gov/coronavirus/index.html). For other information on COVID-19 healthcare utilization, refer to the HCUP Statistical Briefs located at [www.hcup-us.ahrq.gov/reports/statbriefs/sb\\_covid.jsp](http://www.hcup-us.ahrq.gov/reports/statbriefs/sb_covid.jsp).

For additional HCUP statistics, visit:

- HCUP Fast Stats at [www.hcup-us.ahrq.gov/faststats/landing.jsp](http://www.hcup-us.ahrq.gov/faststats/landing.jsp) for easy access to the latest HCUP-based statistics for healthcare information topics
- HCUPnet, HCUP's interactive query system, at [www.hcupnet.ahrq.gov/](http://www.hcupnet.ahrq.gov/)
- HCUP Summary Trend Tables at [www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp](http://www.hcup-us.ahrq.gov/reports/trendtables/summarytrendtables.jsp) for monthly information on hospital utilization
- HCUP Visualization of Inpatient Trends in COVID-19 and Other Conditions at [www.hcup-us.ahrq.gov/datavisualizations/covid-19-inpatient-trends.jsp](http://www.hcup-us.ahrq.gov/datavisualizations/covid-19-inpatient-trends.jsp)

For more information about HCUP, visit [www.hcup-us.ahrq.gov/](http://www.hcup-us.ahrq.gov/).

For a detailed description of HCUP and more information on the design of the State Inpatient Databases (SID), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated October 2020. [www.hcup-us.ahrq.gov/sidoverview.jsp](http://www.hcup-us.ahrq.gov/sidoverview.jsp). Accessed January 22, 2021.

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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](mailto:hcup@ahrq.gov) or send a letter to the address below:

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