HCUP HEALTHCARE COST AND UTILIZATION PROJECT

AHRQ Agency for Healthcare Research and Quality

Changes in Hospitalizations and In-Hospital Deaths for Adults Aged 65 Years and Older in the Initial Period of the COVID-19 Pandemic (April–September 2020), 13 States

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Highlights

- Across 13 States, in the beginning of the pandemic (relative to the same period in the 4 prior years), on average, for adults 65 years and older, there were:
  - 16 percent fewer hospitalizations
  - 30 percent more in-hospital deaths
  - 133 percent more in-hospital deaths among Hispanic patients
- Across 13 States between April and September 2020, among patients aged 65 years and older, the percentage of in-hospital deaths related to COVID-19 was higher for patients:
  - From large metro areas compared with rural areas (35 vs. 22 percent, respectively)
  - Who were Hispanic compared with non-Hispanic White or Black (59 vs. 23 and 43 percent, respectively)
  - From the highest income communities compared with other income communities (34 vs. 27 and 31 percent)
  - With Medicaid as the expected payer compared with all other payers (47 vs. 30–35 percent)

Introduction

Annually, there are approximately 13.2 million hospitalizations for adults aged 65 years and older in the United States, including for medical conditions (67 percent), surgeries (25 percent), injuries (6 percent), and mental health and substance use conditions (2 percent).[1] 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. Adults aged 65+ years, especially those living in nursing homes, are vulnerable to COVID-19 due to their age, underlying frailty, and communal living conditions.[2] The Centers for Disease Control and Prevention (CDC) recently reported that while there was no increased rate of COVID-19 infection among adults aged 65+ years compared with those aged 18–29 years, there were increased rates of hospitalization (4–9 times) and death (95–230 times) among adults aged 65+ years.[3] Hospitalizations related to COVID-19 varied by State and across time.[4] Little is known, however, about the impact of the initial period of the pandemic on hospitalizations and in-hospital deaths overall for adults aged 65+ years.

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data from 13 States on hospitalizations across time periods with a focus on the initial impact of the COVID-19 pandemic. The number of hospitalizations and in-hospital deaths for patients aged 65 years and older is presented overall and by patient characteristics across 13 States from April to September 2020 using quarterly HCUP inpatient data compared with State-level averages from April to September in 2016–2019 using the HCUP State Inpatient Databases (SID). The percentages of all hospitalizations and in-hospital deaths 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 adults aged 65 years and older 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.[5,6] Information contained in this Statistical Brief was primarily obtained from the HCUP Summary Trend Tables.[7] The Summary Trend Tables, accessed as downloadable tables, provide State-specific monthly trends in hospital utilization for 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[8] and will be updated as more quarterly data become available.

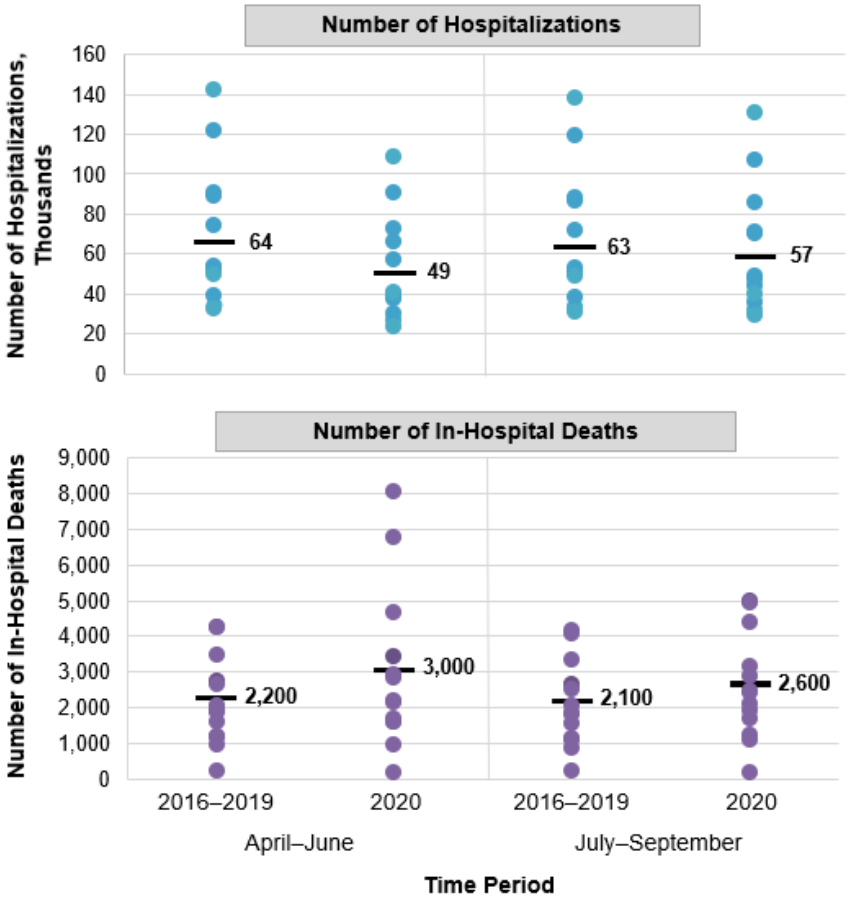
Findings

State-level hospitalizations and in-hospital deaths for adults aged 65 years and older, 2016–2019 and 2020
Figure 1 displays the number of hospitalizations and in-hospital deaths among adults aged 65 years and older 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, across the 13 States examined, the *number of all hospitalizations for adults aged 65 years and older* decreased 23 percent from 64,000 in the second quarter (April-June) 2016-2019 to 49,000 hospitalizations in April-June 2021. There was a less than 10 percent decrease in the average number of hospitalizations for adults aged 65 years and older in the third quarter (July-September) of 2016-2019 (July–September) compared with 2020 (about 63,000 vs. 57,000).

- On average, across the 13 States, the *number of all-cause in-hospital deaths among adults aged 65 years and older* increased 36.4 percent in the second (April–June; about 2,200 vs. 3,000 deaths) and 23.8 percent in the third (July–September; about 2,100 vs. 2,600) quarters of 2020 compared with the average for 2016–2019, respectively.

Figure 1. Number of hospitalizations (in thousands) and in-hospital deaths among adults aged 65+ 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 hundred. 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 2 presents the number of hospitalizations and in-hospital deaths for adults aged 65 years and older by State, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of hospitalizations and in-hospital deaths related to COVID-19 among adults aged 65 years and older in April–September 2020 is also presented. States are listed in alphabetical order within U.S. census regions.

- The average *number of all hospitalizations for adults aged 65 years and older* decreased 16.3 percent from an average of 127,200 in April–September 2016–2019 to 106,500 in April–September 2020. New Jersey had the largest decrease of 23.7 percent fewer hospitalizations (from 179,200 to 136,700 hospitalizations).

  On average across 13 States, 7.0 percent of all hospitalizations for adults aged 65 years and older were related to COVID-19 in April–September 2020, ranging from 0.9 percent in Vermont to 13.0 percent in New Jersey.

- Across the 13 States, the average *number of all-cause in-hospital deaths among adults aged 65 years and older* increased 30 percent from an average of 4,300 in April–September 2016–2019 to 5,600 in April–September 2020, and State-specific estimates increased by at least 10 percent for 11 of the 13 States examined (all but Vermont and Minnesota). The increase was largest in Mississippi and New Jersey, where the number of in-hospital deaths increased 60–61 percent (from 2,300 to 3,700 and 6,800 to 10,900, respectively).

  Across the 13 States, 29.5 percent of in-hospital deaths among adults 65 years and older were related to COVID-19 in April–September 2020. More than half of all in-hospital deaths in New Jersey (51.3 percent) were related to COVID-19.

Figure 2. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 65+ years in April–September 2020 compared with the average of all hospitalizations in April–September 2016–2019, 13 States

Time period: Apr–Sep, 2016–2019 Apr–Sep, 2020

Region	State	Number of hospitalizations	Apr–Sep, 2020 percent related to COVID-19	Number of in-hospital deaths	Apr–Sep, 2020 percent related to COVID-19
13-State average		127,200 106,500	7.0%	4,300 5,600	29.5%
North-east	NJ	179,200 136,700	13.0%	6,800 10,900	51.3%
	VT	11,600 9,300	0.9%	400 400	-
Mid-west	IA	63,500 53,300	5.5%	1,800 2,100	23.3%
	MI	240,600 197,900	6.4%	8,300 11,200	28.7%
	MN	106,900 88,100	4.0%	3,200 3,300	16.6%
	MO	145,600 126,700	5.0%	5,100 6,000	20.3%
	OH	280,600 239,400	4.3%	8,400 9,600	19.0%
South	GA	175,200 158,200	10.1%	5,400 8,400	33.6%
	KY	102,900 87,100	4.2%	4,100 4,700	15.6%
	MD	103,700 82,100	8.6%	3,700 4,900	34.1%
	MS	67,500 58,400	11.4%	2,300 3,700	35.7%
	SC	98,600 80,800	8.7%	3,700 4,500	29.8%
West	CO	77,700 66,200	4.0%	2,300 2,800	21.4%

Notes: Number of hospitalizations and in-hospital deaths is rounded to the nearest hundred. Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–September across these 4 years. Data 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 hospitalizations and in-hospital deaths for adults aged 65 years and older, 2016–2019 and 2020

Figure 3 presents the number of hospitalizations and in-hospital deaths for adults aged 65 years and older in 13 States combined by location of patient residence, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of hospitalizations and in-hospital deaths to COVID-19 among adults 65 years and older related in April–September 2020 is also presented.

- The *number of all hospitalizations for adults aged 65 years and older* decreased approximately 16 percent in April–September 2020 compared with the average in April–September 2016–2019 for patients living in all three geographic locations (large metro, medium/small metro, and rural).

  At the beginning of the pandemic, across the 13 States with available data, the percentage of hospitalizations related to COVID-19 was higher for patients residing in large metro versus rural areas (8.3 vs. 5.5 percent).

- The *number of all-cause in-hospital deaths among adults aged 65 years and older* increased 41.9 percent, 22.3 percent, and 16.8 percent among hospitalizations for patients from large metro, medium/small metro, and rural areas, respectively, in April–September 2020 versus the average in April–September 2016–2019.

  More than one-third (35.3 percent) of in-hospital deaths among patients aged 65 years and older residing in large metro areas were related to COVID-19 in April–September 2020.

Figure 3. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 65+ 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	Apr–Sep, 2020 percent related to COVID-19
Large metro	Apr–Sep, 2016–2019	796,700		26,700	
	Apr–Sep, 2020	667,900	8.3%	37,900	35.3%
Medium/ small metro	Apr–Sep, 2016–2019	469,100		15,700	
	Apr–Sep, 2020	397,000	5.9%	19,200	24.1%
Rural	Apr–Sep, 2016–2019	386,500		13,100	
	Apr–Sep, 2020	318,600	5.5%	15,300	22.2%

Notes: Number of hospitalizations and in-hospital deaths is rounded to the nearest hundred. 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 65 years and older in 13 States combined by patient race/ethnicity, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of hospitalizations and in-hospital deaths related to COVID-19 among adults aged 65 years and older in April–September 2020 is also presented.

- The *number of all hospitalizations for adults aged 65 years and older* decreased by more than 10 percent in April–September 2020 versus the average in April–September 2016–2019 for two groups of patients: non-Hispanic White patients and other non-Hispanic patients. The largest decrease in the number of hospitalizations for adults aged 65 years and older was among non-Hispanic White patients (17.9 percent; from 1,325,300 to 1,087,500 hospitalizations).

  In April–September 2020, the percentage of hospitalizations related to COVID-19 ranged from 5.1 percent for non-Hispanic White patients to 17.3 percent for Hispanic patients.

- The *number of all-cause in-hospital deaths among adults aged 65 years and older* increased in April–September 2020 versus the average in April–September 2016–2019 for all race/ethnicity groups. The smallest increase was for non-Hispanic White adults aged 65 years and older (16.7 percent; from 43,800 to 51,100 deaths), while the number of in-hospital deaths for Hispanic adults aged 65 years and older more than doubled (133.3 percent; from 1,200 to 2,800 deaths). The number of in-hospital deaths for non-Hispanic Black adults aged 65 years and older increased 75.3 percent (from 7,700 to 13,500 deaths), and the number of in-hospital deaths for other non-Hispanic adults aged 65 years and older increased 92.9 percent (from 1,400 to 2,700 deaths).

  More than half (58.6 percent) of in-hospital deaths for Hispanic patients aged 65 years and older were related to COVID-19, whereas 23.1 percent of in-hospital deaths for non-Hispanic White patients were related to COVID-19.

Figure 4. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 65+ 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	Apr–Sep, 2020 percent related to COVID-19
White NH	Apr–Sep, 2016–2019	1,325,300		43,800	
	Apr–Sep, 2020	1,087,500	5.1%	51,100	23.1%
Black NH	Apr–Sep, 2016–2019	218,800		7,700	
	Apr–Sep, 2020	199,500	13.9%	13,500	43.2%
Hispanic	Apr–Sep, 2016–2019	38,900		1,200	
	Apr–Sep, 2020	35,100	17.3%	2,800	58.6%
Other NH	Apr–Sep, 2016–2019	37,300		1,400	
	Apr–Sep, 2020	33,000	14.4%	2,700	47.8%

Abbreviation: NH, non-Hispanic

Notes: Number of hospitalizations and in-hospital deaths is rounded to the nearest hundred. 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 65 years and older in 13 States combined by primary expected payer, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of hospitalizations and in-hospital deaths related to COVID-19 among adults 65 years and older in April–September 2020 is also presented.

- The *number of all hospitalizations for adults aged 65 years and older* decreased by more than 10 percent from the average in April–September 2019 to April–September 2020 for those with an expected payer of Medicare (17.9 percent; from 1,500,900 to 1,232,400 hospitalizations) and Medicaid (10.8 percent; from 17,600 to 15,700 hospitalizations). However, the number of all hospitalizations for adults 65 years and older increased between the time periods for hospitalizations billed to self-pay/no charge (23.0 percent; from 7,400 to 9,100 hospitalizations).

  In April–September 2020, the percentage of hospitalizations related to COVID-19 was highest for stays with an expected payer of Medicaid (13.7 percent) and lowest for hospitalizations with an expected payer Medicare (6.6 percent).

- The *number of all-cause in-hospital deaths among adults aged 65 years and older* increased in April–September 2020 versus the average in April–September 2016–2019 for all expected payers, ranging from a 26.6 percent increase for private insurance (from 6,400 to 8,100 deaths) to an 80.0 percent increase for self-pay/no charge (from 500 to 900 deaths).

  The percentage of in-hospital deaths related to COVID-19 in April–September 2020 ranged from 31.0 percent for private insurance as the expected payer to 47.1 percent for Medicaid as the expected payer.

Figure 5. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 65+ 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	Apr–Sep, 2020 percent related to COVID-19
Private insurance	Apr–Sep, 2016–2019	101,800		6,400	
	Apr–Sep, 2020	98,200	9.6%	8,100	31.0%
Medicare	Apr–Sep, 2016–2019	1,500,900		45,500	
	Apr–Sep, 2020	1,232,400	6.6%	58,300	29.6%
Medicaid	Apr–Sep, 2016–2019	17,600		600	
	Apr–Sep, 2020	15,700	13.7%	1,000	47.1%
Self-pay/ No charge*	Apr–Sep, 2016–2019	7,400		500	
	Apr–Sep, 2020	9,100	13.5%	900	34.7%

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

* 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 65 years and older in 13 States combined by community-level income, comparing April–September 2020 with the average from April–September 2016–2019. The percentage of hospitalizations and in-hospital deaths related to COVID-19 among adults aged 65 years and older in April–September 2020 is also presented.

- The *number of all hospitalizations for adults aged 65 years and older* decreased 14.0 percent (from 486,100 to 418,100 hospitalizations), 16.6 percent (from 819,600 to 683,500 hospitalizations), and 18.5 percent (from 332,400 to 270,900 hospitalizations) in April–September 2020 versus the average in April–September 2016–2019 for patients from communities in the lowest, middle, and highest income quartiles, respectively.

  In April–September 2020, the percentage of hospitalizations related to COVID-19 was highest for patients residing in the lowest (8.2 percent) and highest (7.3 percent) income communities.

- The *number of all-cause in-hospital deaths among adults aged 65 years and older* increased in April–September 2020 versus the average in April–September 2016–2019 for patients from all income quartiles. The increase was largest among patients from the lowest income quartile (37.6 percent) and smallest for those from the middle-income quartiles (25.7 percent).

  Across the 13 States, the percentage of in-hospital deaths related to COVID-19 in April–September 2020 was highest for patients from communities in the top income quartile (34.2 percent) and lowest for patients from communities in the middle-income quartiles (26.5 percent).

Figure 6. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 65+ 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	Apr–Sep, 2020 percent related to COVID-19
Lowest (Q1)	Apr–Sep, 2016–2019	486,100		17,300	
	Apr–Sep, 2020	418,100	8.2%	23,800	30.9%
Middle (Q2–Q3)	Apr–Sep, 2016–2019	819,600		26,500	
	Apr–Sep, 2020	683,500	6.1%	33,300	26.5%
Highest (Q4)	Apr–Sep, 2016–2019	332,400		11,100	
	Apr–Sep, 2020	270,900	7.3%	14,700	34.2%

Abbreviation: Q, quartile

Notes: Number of hospitalizations and in-hospital deaths is rounded to the nearest hundred. 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)

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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.[2,3] 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.

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,[a] 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

[a] 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. Accessed March 18, 2021.

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

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.[b] 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

[b] Claritas. Claritas Demographic Profile by ZIP Code. claritas360.claritas.com/mybestsegments/. Accessed June 27, 2021.

in the highest quartile are designated as having the *highest* income. The income quartile is missing for patients who are homeless or foreign.

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:

Alaska Department of Health and Social Services
Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
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 Office of Health Analytics
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, West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming 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. 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.

For additional HCUP statistics, visit:

- HCUP Fast Stats at 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/
- HCUP Summary Trend Tables at 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

For more information about HCUP, visit 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. 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 or send a letter to the address below:

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