H·CUP HEALTHCARE COST AND UTILIZATION PROJECT

AHRQ Agency for Healthcare Research and Quality

Changes in Hospitalizations and In-Hospital Deaths for Adults Aged 18–64 Years in the Initial Period of the COVID-19 Pandemic (April–December 2020), 29 States

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Introduction

Annually, there are approximately 17.0 million hospitalizations for adults aged 18–64 years in the United States, including for medical conditions (43 percent), maternal conditions (23 percent), surgeries (21 percent), mental health and substance use conditions (9 percent), and injuries[a] (4 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. Hospitalizations related to COVID-19 varied by State and across time.[2] The Centers for Disease Control and Prevention (CDC) reported higher rates of COVID-19 cases among adults aged 60 years and younger,[3] but little is known about the impact of the initial period of the pandemic on hospitalizations and in-hospital deaths overall for adults aged 18–64 years.

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data from 29 States on hospitalizations for adults aged 18–64 years 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 18–64 years is presented overall and by patient characteristics from April to December 2020 compared with State-level averages from April to December in 2016–2019. The percentages of all hospitalizations and in-hospital deaths related to COVID-19 for adults aged 18–64 years during the April–December 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 18–64 years treated in community, nonrehabilitation hospitals in 29 States (Arizona, California, Connecticut, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, Washington, and Wisconsin) for which HCUP data were available for April–December 2016–2019 (State Inpatient Databases [SID]) and April–December 2020 (quarterly inpatient

Highlights

- Across 29 States, the average number of hospitalizations for adults aged 18–64 years decreased 18 percent to about 80,000 while the average number of in-hospital deaths increased 36 percent to about 1,500 in April–June 2020 compared with the same months in previous years.
- In April–December 2020, the percentages of hospitalizations and in-hospital deaths related to COVID-19 for adults aged 18–64 years were 7 and 26 percent, respectively, corresponding to 496,600 adult hospitalizations and 34,500 in-hospital deaths related to COVID-19 across 29 States.
- About 3 in 10 in-hospital deaths for patients aged 18–64 years from large metropolitan (metro) areas were COVID-19 related, compared with 22 percent for same-aged patients from rural areas in April–December 2020 across 29 States.
- Across 29 States, the number of in-hospital deaths for Hispanic patients aged 18–64 years more than doubled in April–December 2020 compared with the same months in previous years; about half of these deaths were COVID-19 related.
- Across expected payers, Medicare hospitalizations for adults aged 18–64 years had the largest decrease (19 percent) while those with an expected payer of Medicaid had the largest increase of in-hospital deaths (48 percent) in April–December 2020 compared with the same months in previous years in 29 States.

[a] Each hospitalization was assigned to a single hospitalization type hierarchically, based on the following order of hospital stay principal diagnoses: maternal, neonatal, mental health/substance use, injury, surgical, and medical.

data). These States accounted for 67.7 percent of the resident U.S. population of adults aged 18–64 years in 2019.[4,5] Information contained in this Statistical Brief was primarily obtained from the HCUP Summary Trend Tables.[6] 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[7] and will be updated as more quarterly data become available.

Findings

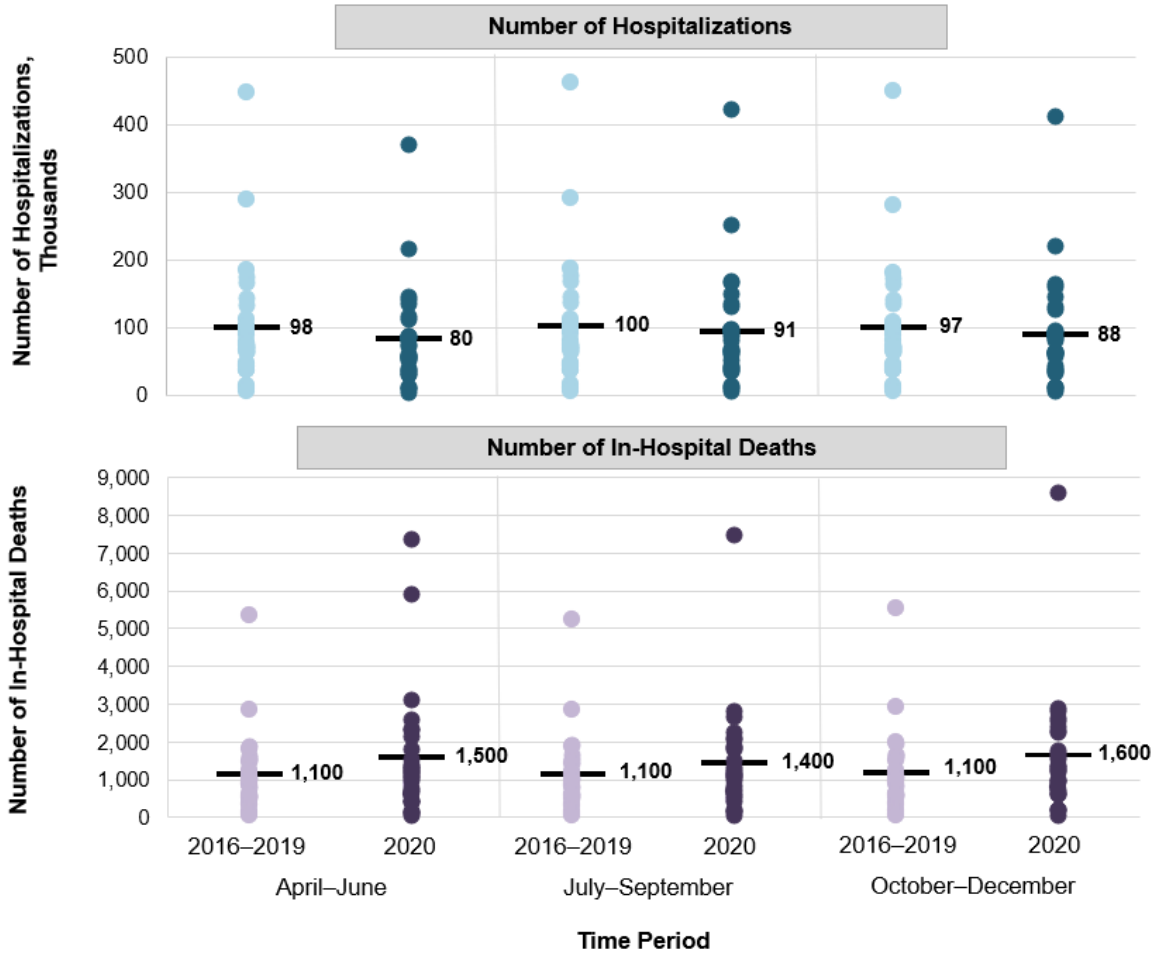
State-level hospitalizations and in-hospital deaths for adults aged 18–64 years, 2016–2019 and 2020
Figure 1 displays the number of hospitalizations and in-hospital deaths among adults aged 18–64 years for each of the 29 States in April–December 2016–2019[b] and 2020. Each dot in the figure represents the State-specific number of hospitalizations or in-hospital deaths. The average number of hospitalizations and in-hospital deaths across these 29 States is also presented (black horizontal bar).

- On average, the *number of all hospitalizations for adults aged 18–64 years* in the 29 States examined decreased 18.4 percent in the second quarter of 2020 (April–June) compared with the same quarter in 2016–2019 (about 98,000 vs. 80,000 hospitalizations).

- On average, the *number of all-cause in-hospital deaths among patients aged 18–64 years* in the 29 States examined increased 36.4 percent, 27.3 percent, and 45.5 percent in the second (April–June; about 1,100 to 1,500 deaths), third (July–September; about 1,100 to 1,400 deaths), and fourth (October–December; about 1,100 to 1,600 deaths) quarters of 2020 compared with the same quarters in 2016–2019, respectively.

[b] Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–December across these 4 years.

Figure 1. Number of hospitalizations (in thousands) and in-hospital deaths among adults aged 18–64 years by quarter, April–December 2020 compared with the average of April–December 2016–2019, 29 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–December across these 4 years. Each dot in the figure represents the State-specific number of hospitalizations or in-hospital deaths.

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 29 States (AZ, CA, CT, GA, IA, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MS, ND, NJ, NY, OH, OR, PA, SC, SD, TN, VA, VT, WA, and WI) (available as of October 2021)

Figure 2 presents the number of hospitalizations and in-hospital deaths for adults aged 18–64 years by census region, comparing April–December 2020 with the average from April–December 2016–2019.[c] The percentage of hospitalizations and in-hospital deaths related to COVID-19 in April–December 2020 is also presented. Similar State-level data are provided in the Appendix.

- The *number of all hospitalizations for adults aged 18–64 years* decreased in April–December 2020 compared with the average in April–December 2016–2019 for all regions based on the 29 States examined. Examined States in the Northeast had a 17.5 percent decrease in hospitalizations (from 1.9 to 1.6 million hospitalizations). The number of hospitalizations for adults aged 18–64 years in New Jersey had the largest decrease of examined States, with a 20.8 percent reduction in hospitalizations (from 331,400 to 262,500 hospitalizations) (see Appendix).

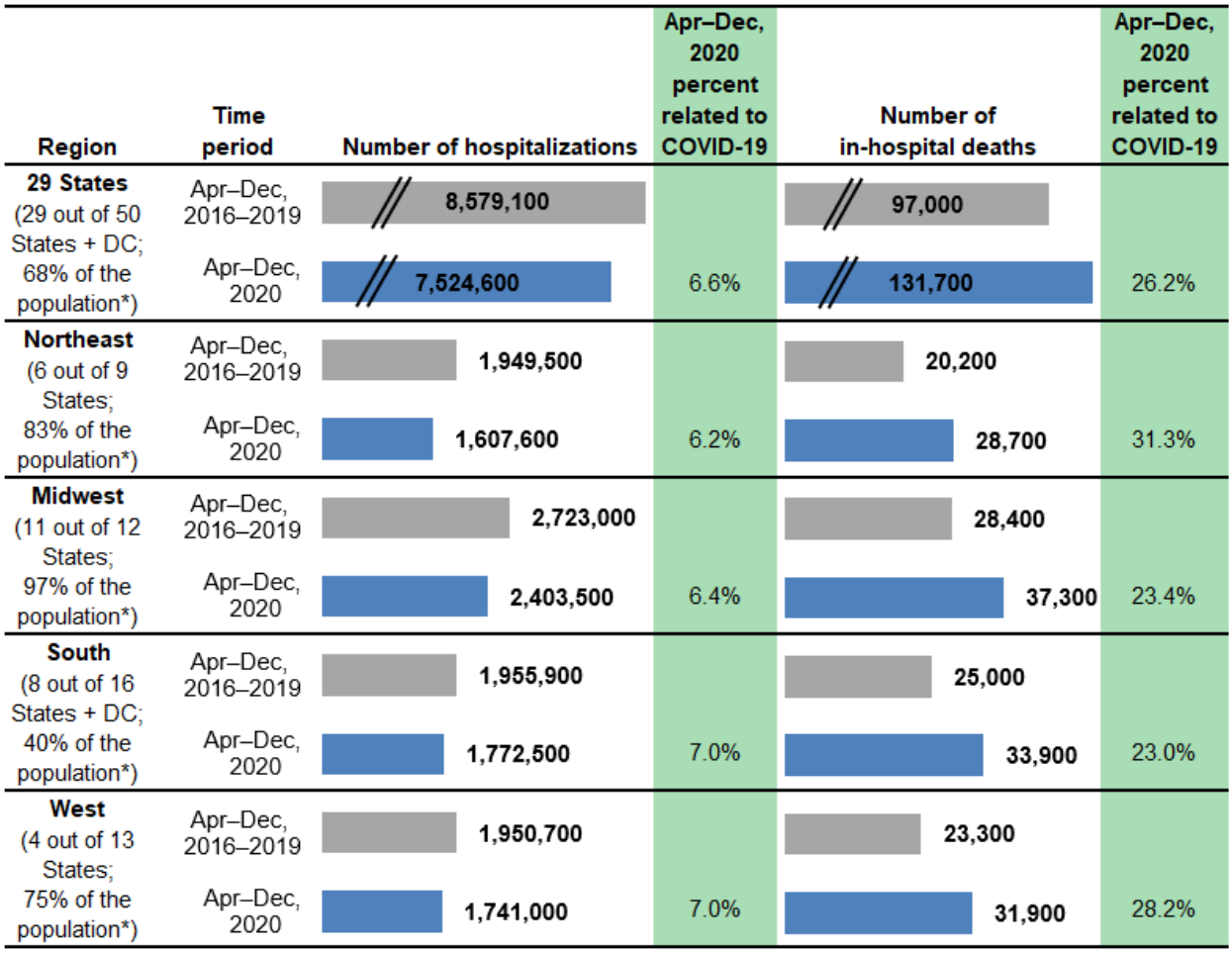
  Across 29 States, 6.6 percent of all hospitalizations were related to COVID-19 in April–December 2020, ranging from 6.2 percent in the Northeast to 7.0 percent in the South and West. The percentage of COVID-19-related hospitalizations for adult patients in the 29 examined States ranged from 0.9 percent in Vermont to 10.0 percent in New Jersey (see Appendix).

- The *number of all-cause in-hospital deaths among patients aged 18–64 years* in April–December 2020 versus the average in April–December 2016–2019 increased for all census regions based on the 29 States examined. The number of in-hospital deaths increased 42.1 percent (from 20,200 to 28,700 deaths) in the Northeast. By State, the increase was largest in Arizona, where the number of in-hospital deaths for adult patients increased by 88.5 percent (from 2,600 to 4,900 deaths) (see Appendix).

  Across the 29 States, 26.2 percent of in-hospital deaths among patients aged 18–64 years were related to COVID-19 in April–December 2020. In the Northeast, 31.3 percent of in-hospital deaths among patients aged 18–64 years were related to COVID-19. Rates ranged from 4.1 percent in Maine to 46.1 percent in New Jersey (see Appendix).

[c] Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–December across these 4 years.

Figure 2. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 18–64 years in April–December 2020 compared with the average of all hospitalizations in April–December 2016–2019, 29 States



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–December across these 4 years. // indicates a break in the axis.

* Percentage of the resident U.S. population of adults aged 18–64 years in the specified region in 2019.

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 29 States (AZ, CA, CT, GA, IA, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MS, ND, NJ, NY, OH, OR, PA, SC, SD, TN, VA, VT, WA, and WI) (available as of October 2021)

Patient characteristics associated with hospitalizations and in-hospital deaths for adults aged 18–64 years, 2016–2019 and 2020

Figure 3 presents the number of hospitalizations and in-hospital deaths for adults aged 18–64 years in 29 States combined, by location of patient residence, comparing April–December 2020 with the average from April–December 2016–2019.[d] The percentage of hospitalizations and in-hospital deaths related to COVID-19 in April–December 2020 is also presented.

- The *number of all hospitalizations for adults aged 18–64 years* decreased 12.7 percent, 10.9 percent, and 13.0 percent in April–December 2020 compared with the average in April–December 2016–2019 in large metro areas (5.0 to 4.3 million hospitalizations), medium/small metro areas (2.4 to 2.1 million hospitalizations), and rural areas (1.2 to 1.1 million hospitalizations), respectively.

  At the beginning of the pandemic, across the 29 States with available data, the percentage of hospitalizations related to COVID-19 among patients aged 18–64 years was higher for patients residing in large metro versus other areas (7.3 vs. 5.8 percent).

- The *number of all-cause in-hospital deaths among patients aged 18–64 years* increased 42.2 percent, 27.6 percent, and 29.3 percent among hospitalizations for patients from large metro areas (53,100 to 75,500 deaths), medium/small metro areas (27,900 to 35,600 deaths), and rural areas (15,700 to 20,300 deaths), respectively, in April–December 2020 versus the average in April–December 2016–2019.

  Nearly 3 in 10 in-hospital deaths among hospitalizations for patients aged 18–64 years residing in large metro areas (29.5 percent) were COVID-19 related in April–December 2020.

Figure 3. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 18–64 years by location of patient residence in April–December 2020 compared with the average of all hospitalizations in April–December 2016–2019, 29 States

Patient location	Time period	Number of hospitalizations	Apr–Dec, 2020 percent related to COVID-19	Number of in-hospital deaths	Apr–Dec, 2020 percent related to COVID-19
Large metro	Apr–Dec, 2016–2019	4,966,600		53,100	
	Apr–Dec, 2020	4,333,600	7.3%	75,500	29.5%
Medium/ small metro	Apr–Dec, 2016–2019	2,364,000		27,900	
	Apr–Dec, 2020	2,107,200	5.8%	35,600	21.8%
Rural	Apr–Dec, 2016–2019	1,230,700		15,700	
	Apr–Dec, 2020	1,070,400	5.8%	20,300	21.6%

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–December 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 29 States (AZ, CA, CT, GA, IA, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MS, ND, NJ, NY, OH, OR, PA, SC, SD, TN, VA, VT, WA, and WI) (available as of October 2021)

[d] Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–December across these 4 years.

Figure 4 presents the number of hospitalizations and in-hospital deaths for adults aged 18–64 years in 29 States combined, by patient race/ethnicity, comparing April–December 2020 with the average from April–December 2016–2019.[e] The percentage of hospitalizations and in-hospital deaths related to COVID-19 in April–December 2020 is also presented.

- The *number of all hospitalizations for adults aged 18–64 years* decreased by at least 10 percent in April–December 2020 versus the average in April–December 2016–2019 for non-Hispanic White patients (15.7 percent; 5.1 to 4.3 million hospitalizations) and non-Hispanic Black patients (10.0 percent; 1.6 to 1.5 million hospitalizations).

  In April–December 2020, the percentage of hospitalizations related to COVID-19 among patients aged 18–64 years ranged from 4.5 percent for non-Hispanic White patients to 12.8 percent for Hispanic patients.

- The *number of all-cause in-hospital deaths among patients aged 18–64 years* increased in April–December 2020 versus the average in April–December 2016–2019 for all race/ethnicity groups. The smallest increase was for non-Hispanic White adult patients (17.7 percent; from 58,300 to 68,600 deaths), while the number for Hispanic adult patients more than doubled (115.4 percent; from 9,100 to 19,600 deaths). The number of in-hospital deaths for non-Hispanic Black adult patients aged 18–64 years increased 44.3 percent (from 19,200 to 27,700 deaths).

  Overall, 17.2 percent of all in-hospital deaths among non-Hispanic White adults aged 18–64 years were COVID-19 related in April–December 2020, while nearly half (49.9 percent) of in-hospital deaths for Hispanic adults were related to COVID-19.

Figure 4. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 18–64 years by patient race/ethnicity in April–December 2020 compared with the average of all hospitalizations in April–December 2016–2019, 29 States

Patient race/ ethnicity	Time period	Number of hospitalizations	Apr–Dec, 2020 percent related to COVID-19	Number of in-hospital deaths	Apr–Dec, 2020 percent related to COVID-19
White NH	Apr–Dec, 2016–2019	5,064,900		58,300	
	Apr–Dec, 2020	4,269,600	4.5%	68,600	17.2%
Black NH	Apr–Dec, 2016–2019	1,627,600		19,200	
	Apr–Dec, 2020	1,465,500	7.9%	27,700	28.8%
Hispanic	Apr–Dec, 2016–2019	1,040,000		9,100	
	Apr–Dec, 2020	1,025,000	12.8%	19,600	49.9%
Other NH	Apr–Dec, 2016–2019	622,800		6,700	
	Apr–Dec, 2020	570,000	8.5%	10,800	33.9%

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–December 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 29 States (AZ, CA, CT, GA, IA, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MS, ND, NJ, NY, OH, OR, PA, SC, SD, TN, VA, VT, WA, and WI) (available as of October 2021)

[e] Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–December across these 4 years.

Figure 5 presents the number of hospitalizations and in-hospital deaths for adults aged 18–64 years in 29 States combined, by primary expected payer, comparing April–December 2020 with the average from April–December 2016–2019.[f] The percentage of hospitalizations and in-hospital deaths related to COVID-19 in April–December 2020 is also presented.

- The *number of all hospitalizations for adults aged 18–64 years* decreased in April–December 2020 versus the average in April–December 2016–2019 for all expected payers, with the largest decrease among hospitalizations with an expected payer of Medicare (18.8 percent; 1.4 to 1.1 million hospitalizations).

  In April–December 2020, the percentage of hospitalizations related to COVID-19 among patients aged 18–64 years was lowest for hospitalizations with Medicaid as an expected payer (5.7 percent) and similar for all other expected payers.

- The *number of all-cause in-hospital deaths among patients aged 18–64 years* increased in April–December 2020 versus the average in April–December 2016–2019 for all expected payers, ranging from a 28.6 percent increase for stays with an expected payer of Medicare (24,800 to 31,900 deaths) to a 48.1 percent increase for those with an expected payer of Medicaid (29,100 to 43,100 deaths).

  The percentage of adult in-hospital deaths related to COVID-19 among patients aged 18–64 years in April–December 2020 ranged from 20.7 percent for stays with self-pay/no charge as an expected payer to 28.4 percent for stays with private insurance as an expected payer.

Figure 5. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 18–64 years by primary expected payer in April–December 2020 compared with the average of all hospitalizations in April–December 2016–2019, 29 States

Primary expected payer	Time period	Number of hospitalizations	Apr–Dec, 2020 percent related to COVID-19	Number of in-hospital deaths	Apr–Dec, 2020 percent related to COVID-19
Private insurance	Apr–Dec, 2016–2019	3,572,900		31,400	
	Apr–Dec, 2020	3,085,800	7.0%	40,800	28.4%
Medicare	Apr–Dec, 2016–2019	1,355,700		24,800	
	Apr–Dec, 2020	1,101,100	6.7%	31,900	26.5%
Medicaid	Apr–Dec, 2016–2019	2,876,100		29,100	
	Apr–Dec, 2020	2,654,500	5.7%	43,100	24.7%
Self-pay/ No charge*	Apr–Dec, 2016–2019	450,900		6,800	
	Apr–Dec, 2020	404,700	7.3%	9,100	20.7%

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–December 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 29 States (AZ, CA, CT, GA, IA, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MS, ND, NJ, NY, OH, OR, PA, SC, SD, TN, VA, VT, WA, and WI) (available as of October 2021)

[f] Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–December across these 4 years.

Figure 6 presents the number of hospitalizations and in-hospital deaths for adults aged 18–64 years in 29 States combined, by community-level income, comparing April–December 2020 with the average from April–December 2016–2019.[g] The percentage of hospitalizations and in-hospital deaths related to COVID-19 in April–December 2020 is also presented.

- The *number of all hospitalizations for adults aged 18–64 years* decreased more for patients residing in the highest income areas (14.6 percent; from 1.7 to 1.4 million hospitalizations) compared with patients from the middle (11.9 percent; from 4.2 to 3.7 million hospitalizations) and the lowest (11.9 percent; from 2.6 to 2.3 million hospitalizations) income areas in April–December 2020 versus the average in April–December 2016–2019.

  In April–December 2020, the percentage of hospitalizations related to COVID-19 for patients aged 18–64 years was highest (7.3 percent) among hospitalizations for patients residing in the lowest income quartile.

- The *number of all-cause in-hospital deaths among patients aged 18–64 years* increased in April–December 2020 versus the average in April–December 2016–2019 for hospitalizations for patients from all income quartiles. The increase was largest for patients residing in the lowest income quartile (42.0 percent; 32,600 to 46,300 deaths).

  Across the 29 States, the percentage of in-hospital deaths related to COVID-19 among patients aged 18–64 years in April–December 2020 was highest for patients residing in the lowest income quartile (27.6 percent) and lowest for patients residing in the highest income quartile (23.7 percent).

Figure 6. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 18–64 years by community-level income in April–December 2020 compared with the average of all hospitalizations in April–December 2016–2019, 29 States

Community-level income	Time period	Number of hospitalizations	Apr–Dec, 2020 percent related to COVID-19	Number of in-hospital deaths	Apr–Dec, 2020 percent related to COVID-19
Lowest (Q1)	Apr–Dec, 2016–2019	2,590,300		32,600	
	Apr–Dec, 2020	2,280,800	7.3%	46,300	27.6%
Middle (Q2–Q3)	Apr–Dec, 2016–2019	4,162,800		46,300	
	Apr–Dec, 2020	3,668,300	6.6%	62,500	26.1%
Highest (Q4)	Apr–Dec, 2016–2019	1,681,000		16,200	
	Apr–Dec, 2020	1,436,300	5.9%	20,400	23.7%

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–December 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 29 States (AZ, CA, CT, GA, IA, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MS, ND, NJ, NY, OH, OR, PA, SC, SD, TN, VA, VT, WA, and WI) (available as of October 2021)

[g] Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–December across these 4 years.

Appendix. Number of hospitalizations, in-hospital deaths, and percentage of each related to COVID-19 among adults aged 18–64 years in April–December 2020 compared with the average of all hospitalizations in April–December 2016–2019, 29 States

State of hospitalization	Number of hospitalizations		Apr–Dec, 2020 percent related to COVID-19	Number of in-hospital deaths		Apr–Dec, 2020 percent related to COVID-19
	Apr–Dec, 2016–2019*	Apr–Dec, 2020		Apr–Dec, 2016–2019*	Apr–Dec, 2020	
All regions (29 States)	**8,579,100**	**7,524,600**	**6.6**	**97,000**	**131,700**	**26.2**
Northeast	**1,949,500**	**1,607,600**	**6.2**	**20,200**	**28,700**	**31.3**
CT	139,300	126,000	6.8	1,600	2,200	25.2
ME	45,200	39,100	1.4	600	500	4.1
NJ	331,400	262,500	10.0	3,500	5,500	46.1
NY	863,500	689,000	5.4	8,600	13,100	32.7
PA	552,500	476,100	5.6	5,700	7,100	22.1
VT	17,700	14,800	0.9	200	200	–
Midwest	**2,723,000**	**2,403,500**	**6.4**	**28,400**	**37,300**	**23.4**
IA	110,000	101,000	7.1	1,000	1,500	26.7
IL	499,700	430,500	8.8	4,800	7,000	30.7
IN	270,600	246,900	6.5	3,100	3,900	22.0
KS	110,400	103,700	5.8	1,100	1,500	24.4
MI	428,000	368,500	6.0	4,900	6,400	23.9
MN	212,500	184,400	5.8	1,800	2,100	18.6
MO	302,500	267,600	5.4	3,400	4,200	21.1
ND	32,900	30,200	6.3	400	500	27.1
OH	525,400	466,700	5.3	5,700	7,200	18.0
SD	36,000	34,600	7.6	300	500	30.8
WI	194,800	169,500	6.3	1,800	2,400	22.4
South	**1,955,900**	**1,772,500**	**7.0**	**25,000**	**33,900**	**23.0**
GA	404,400	382,000	8.8	4,500	6,900	25.8
KY	209,700	181,500	4.9	2,800	3,600	14.6
LA	199,400	184,400	7.7	2,700	3,800	28.5
MD	223,000	185,100	7.9	2,500	3,100	28.6
MS	133,700	118,300	8.7	1,700	2,700	32.6
SC	192,000	168,200	6.2	2,700	3,400	21.5
TN	287,000	277,600	6.1	4,400	5,900	19.4
VA	306,800	275,300	5.6	3,700	4,500	17.3
West	**1,950,700**	**1,741,000**	**7.0**	**23,300**	**31,900**	**28.2**
AZ	241,900	234,100	9.2	2,600	4,900	36.8
CA	1,359,000	1,202,100	7.5	16,100	22,000	30.1
OR	127,700	111,700	2.9	1,600	1,600	10.0
WA	222,000	193,100	3.8	3,000	3,400	11.7

Notes: Number of hospitalizations and in-hospital deaths is rounded to the nearest hundred. Data calculations are suppressed for counts <11 and denoted with a "–".

* Counts for 2016–2019 represent the mean number of hospitalizations or in-hospital deaths during April–December 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 29 States (AZ, CA, CT, GA, IA, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MS, ND, NJ, NY, OH, OR, PA, SC, SD, TN, VA, VT, WA, and WI) (available as of October 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 adult patients aged 18–64 years treated in community, nonrehabilitation hospitals in 29 States (Arizona, California, Connecticut, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, Washington, and Wisconsin) for which HCUP data were available for April–December 2016–2019 and April–December 2020. These States account for the following percentages of the resident U.S. adult population aged 18–64 years: 67.7 percent of the total population, 69.4 percent of the non-Hispanic White population, 68.2 percent of the non-Hispanic Black population, 59.8 percent of the Hispanic population, and 71.8 percent of the other non-Hispanic race/ethnicity population, including but not limited to American Indian, Alaska Native, Asian, Native Hawaiian, and other Pacific Islander.[4,5] 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 and in-hospital deaths, defined by the discharge disposition, are identified by any-listed ICD-10-CM code of U07.1 (2019 novel coronavirus disease) on the discharge record. Per coding guidelines,[h] 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

[h] Centers for Disease Control and Prevention, National Center for Health Statistics. ICD-10-CM 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.[i] The value ranges for the income quartiles vary by year. Patients in the first quartile are assigned to the *lowest* income category, patients in the middle two quartiles are assigned to the *middle* income category, and

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

patients in the highest quartile are assigned to the *highest* income category. 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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