H·CUP 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–December 2020), 29 States

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Highlights

- Across 29 States between April and December 2020 (relative to the average in 2016–2019), for adults aged 65 years and older, there were:
  - Fewer hospitalizations overall (12 percent fewer overall and 24 percent fewer in the second quarter)
  - More in-hospital deaths overall (39 percent more overall and 37, 19, and 55 percent more for each quarter examined)
  - Disproportionately more in-hospital deaths among Hispanic, non-Hispanic Black, and other non-Hispanic race/ethnicity patients (118, 70, and 59 percent increases, respectively) than among non-Hispanic White patients (27 percent increase)
- Across 29 States between April and December 2020, among patients aged 65 years and older, the percentage of in-hospital deaths related to COVID-19 was 33 percent. The in-hospital COVID-19 death rate was higher for patients:
  - Who were Hispanic, non-Hispanic Black, and other non-Hispanic race/ethnicity (55, 40, and 39 percent, respectively) compared with non-Hispanic White (29 percent)
  - With Medicaid as the expected payer compared with all other payers (48 vs. 31–35 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[a] (6 percent), and mental health and substance use conditions (2 percent).[1] With the COVID-19 pandemic beginning in 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) 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 pandemic on all hospitalizations and in-hospital deaths for adults aged 65+ years in 2020.

This Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents data from 29 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 29 States from April to December 2020 using quarterly HCUP inpatient data compared with State-level averages from April to December 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–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 65 years and older 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

[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.

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 accounted for 67.4 percent of the resident U.S. population of adults aged 65 years and older 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

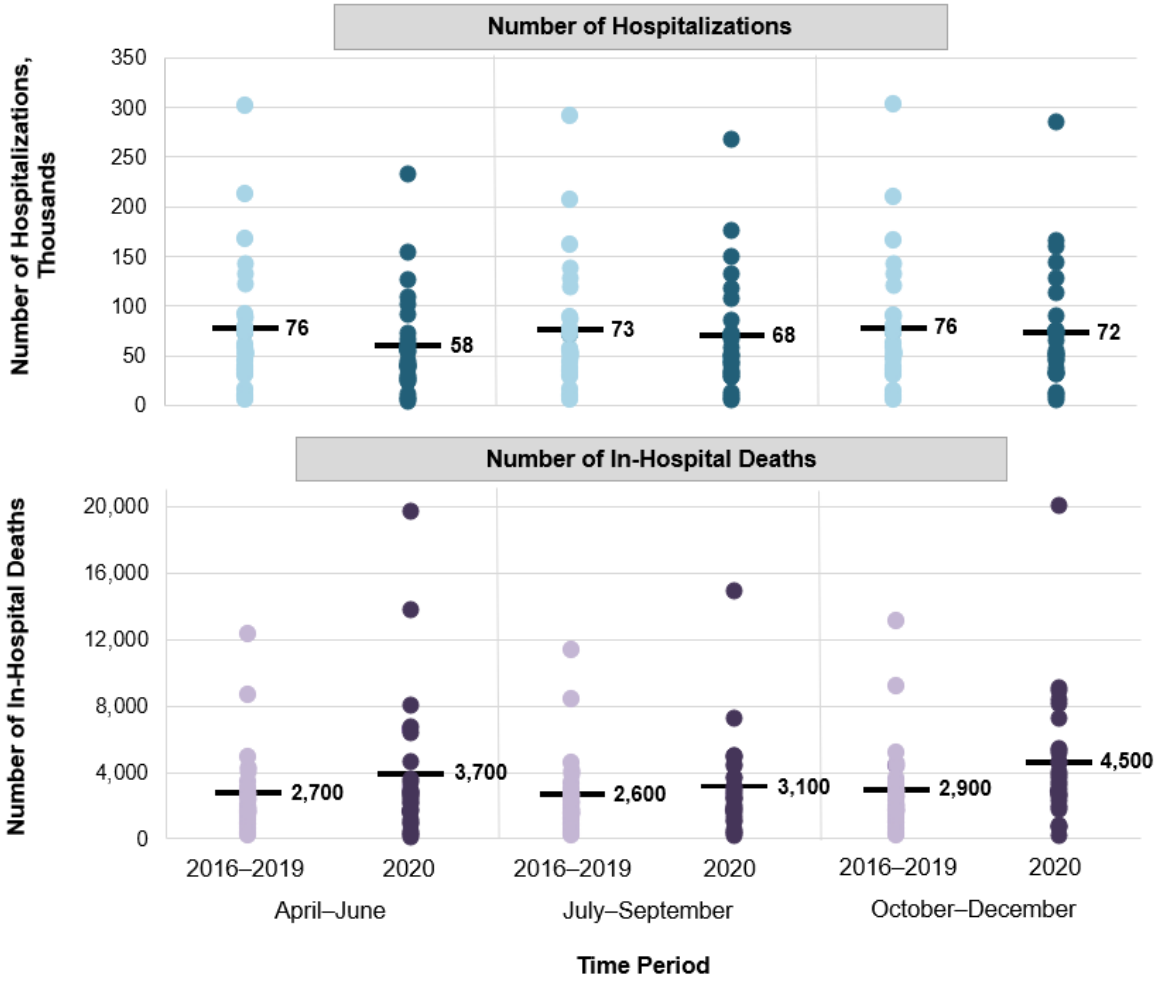
State-level hospitalizations and in-hospital deaths for adults aged 65 years and older, 2016–2019 and 2020
Figure 1 displays the number of hospitalizations and in-hospital deaths among adults aged 65 years and older for each of the 29 States in April–December of 2016–2019[b] and 2020. Each dot in the 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, in the second quarter (April–June), across the 29 States examined, the *number of all hospitalizations for adults aged 65 years and older* decreased 23.7 percent in 2020 compared with the same quarter in 2016–2019 (from 76,000 to 58,000 hospitalizations).

- Across the 29 States, the *number of all-cause in-hospital deaths among adults aged 65 years and older* increased 37.0 percent in the second quarter (about 2,700 vs. 3,700 deaths), 19.2 percent in the third quarter (about 2,600 vs. 3,100 deaths), and 55.2 percent in the fourth quarter (about 2,900 vs. 4,500 deaths) of 2020 compared with the average for 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 65+ 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 65 years and older by 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 among adults aged 65 years and older in April–December 2020 is also presented. Similar State-level data are provided in the Appendix.

- Combined, across the 29 States, the *number of all hospitalizations for adults aged 65 years and older* decreased 12.2 percent, from 6.5 million in April–December 2016–2019 to 5.7 million in April–December 2020. Together, six of nine States in the Northeast had a 17.6 percent decrease in the number of hospitalizations between these two periods, with noted variation by State (see Appendix). In combination, the States with available data in the Midwest, South, and West had a 10–11 percent decrease in the number of hospitalizations in April–December 2020 compared with the average from the same period in 2016–2019. Compared with the average in the last three quarters of 2016–2019, the percentage decrease in the number of hospitalizations varied by State, ranging from a <3 percent decrease to a 23 percent decrease in hospitalizations during the same period in 2020 (see Appendix).

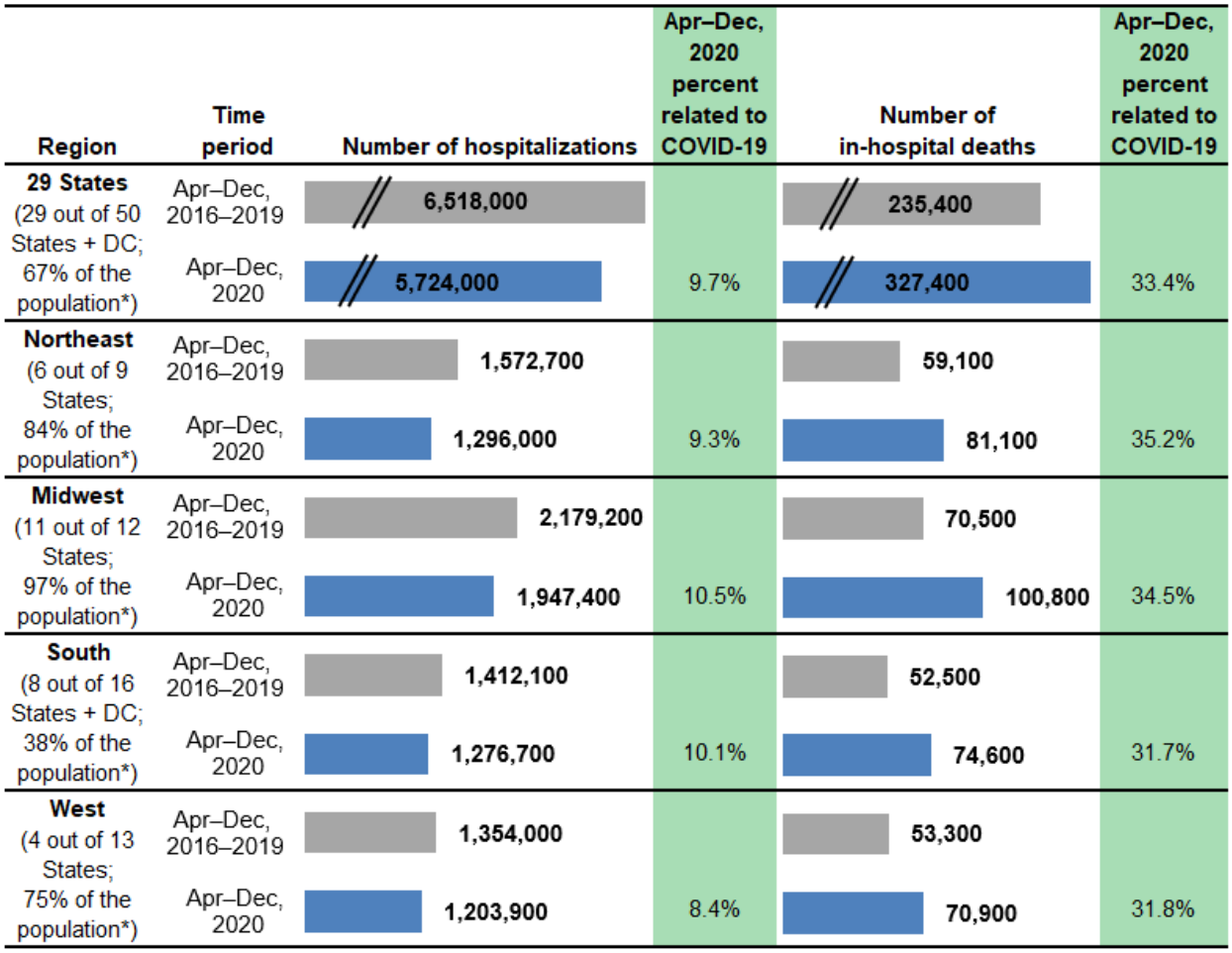
  Combined, across the 29 States, 9.7 percent of all hospitalizations for adults aged 65 years and older were related to COVID-19 in April–December 2020, ranging from 1.5 percent in Vermont to 13.5 percent in South Dakoda and Mississippi (see Appendix).

- Across the 29 States combined, the *number of all-cause in-hospital deaths among adults aged 65 years and older* increased 39.1 percent, from 235,400 (average) in April–December 2016–2019 to 327,400 in April–December 2020. State-specific estimates increased 8 to 86 percent for 27 of the 29 States examined (all but Vermont and Maine; see Appendix).

  Across the 29 States, 33.4 percent of in-hospital deaths among adults aged 65 years and older were related to COVID-19 in April–December 2020.

[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 65+ 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 65 years and older 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 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 29 States combined by location of patient residence, comparing April–December 2020 with the average from April–December 2016–2019. The percentage of hospitalizations and in-hospital deaths related to COVID-19 among adults aged 65 years and older in April–December 2020 is also presented.

- The *number of all hospitalizations for adults aged 65 years and older* decreased 12.9 percent, 10.4 percent, and 12.5 percent in April–December 2020 compared with the average in April–December 2016–2019 for patients living in large metropolitan (metro), medium/small metro, and rural areas, respectively.

  Between 9 and 10 percent of hospitalizations for adults aged 65 years and older were related to COVID-19, regardless of patient residence.

- The *number of all-cause in-hospital deaths among adults aged 65 years and older* increased 44.2 percent, 33.8 percent, and 32.1 percent among hospitalizations for patients from large metro, medium/small metro, and rural areas, respectively, in April–December 2020 versus the average in April–December 2016–2019.

  More than one-third (35.7 percent) of in-hospital deaths among patients aged 65 years and older residing in large metro areas were related to COVID-19 in April–December 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–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	3,528,200		127,200	
	Apr–Dec, 2020	3,071,600	10.1%	183,400	35.7%
Medium/ small metro	Apr–Dec, 2016–2019	1,832,000		65,900	
	Apr–Dec, 2020	1,640,800	8.9%	88,200	30.6%
Rural	Apr–Dec, 2016–2019	1,152,100		42,000	
	Apr–Dec, 2020	1,008,100	9.7%	55,500	30.6%

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)

Figure 4 presents the number of hospitalizations and in-hospital deaths for patients aged 65 years and older in 29 States combined by patient race/ethnicity, 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 among adults aged 65 years and older in April–December 2020 is also presented.

- The *number of all hospitalizations for adults aged 65 years and older* decreased by more than 10 percent in April–December 2020 versus the average in April–December 2016–2019 for non-Hispanic White patients (13.7 percent; from 5.0 to 4.3 million hospitalizations).

  In April–December 2020, the percentage of hospitalizations related to COVID-19 ranged from 8.2 percent for non-Hispanic White patients to 18.1 percent for Hispanic patients.

- The *number of all-cause in-hospital deaths among adults aged 65 years and older* increased 39.1 percent 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 patients (27.2 percent; from 176,000 to 223,900 deaths), while the number of in-hospital deaths for Hispanic patients more than doubled (117.9 percent; from 12,300 to 26,800 deaths). The number of in-hospital deaths for non-Hispanic Black patients increased 69.8 percent (from 26,200 to 44,500 deaths).

  More than half (54.7 percent) of in-hospital deaths for Hispanic patients aged 65 years and older were related to COVID-19, whereas 28.9 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–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	4,988,000		176,000	
	Apr–Dec, 2020	4,303,100	8.2%	223,900	28.9%
Black NH	Apr–Dec, 2016–2019	706,600		26,200	
	Apr–Dec, 2020	668,500	13.4%	44,500	40.2%
Hispanic	Apr–Dec, 2016–2019	353,600		12,300	
	Apr–Dec, 2020	335,900	18.1%	26,800	54.7%
Other NH	Apr–Dec, 2016–2019	333,400		14,800	
	Apr–Dec, 2020	303,100	12.5%	23,500	39.3%

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)

[d] 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 patients aged 65 years and older in 29 States combined by primary expected payer, comparing April–December 2020 with the average from April–December 2016–2019. The percentage of hospitalizations and in-hospital deaths related to COVID-19 among adults aged 65 years and older in April–December 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–December 2016–2019 to April–December 2020 for those with an expected payer of Medicare (13.3 percent; from 5.8 to 5.1 million hospitalizations).

  In April–December 2020, the percentage of hospitalizations related to COVID-19 was highest for stays with an expected payer of Medicaid (16.3 percent) and lowest for hospitalizations with an expected payer Medicare (9.4 percent).

- The *number of all-cause in-hospital deaths among adults aged 65 years and older* increased at least 30 percent in April–December 2020 versus the average in April–December 2016–2019 for all expected payers, ranging from a 34.7 percent increase for private insurance (from 22,200 to 29,900 deaths) to a 100.0 percent increase for Medicaid (from 4,100 to 8,200 deaths).

  The percentage of in-hospital deaths related to COVID-19 in April–December 2020 ranged from 30.9 percent for private insurance as the expected payer to 47.5 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–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	433,000		22,200	
	Apr–Dec, 2020	409,500	10.7%	29,900	30.9%
Medicare	Apr–Dec, 2016–2019	5,839,000		197,900	
	Apr–Dec, 2020	5,059,700	9.4%	271,000	33.8%
Medicaid	Apr–Dec, 2016–2019	113,300		4,100	
	Apr–Dec, 2020	107,800	16.3%	8,200	47.5%
Self-pay/ No charge*	Apr–Dec, 2016–2019	34,000		2,000	
	Apr–Dec, 2020	33,900	14.9%	3,500	35.4%

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–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)

Figure 6 presents the number of hospitalizations and in-hospital deaths for patients aged 65 years and older in 29 States combined by community-level income, 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 among adults aged 65 years and older in April–December 2020 is also presented.

- The *number of all hospitalizations for adults aged 65 years and older* decreased 10.3 percent (from 1.6 to 1.4 million hospitalizations), 11.7 percent (from 3.3 to 2.9 million hospitalizations), and 15.0 percent (from 1.5 to 1.3 million hospitalizations) in April–December 2020 versus the average in April–December 2016–2019 for patients from communities in the lowest, middle, and highest income quartiles, respectively.

  In April–December 2020, the percentage of hospitalizations related to COVID-19 ranged from 8.1 for patients from communities in the highest income quartile to 11.4 percent for patients from communities in the lowest income quartile.

- The *number of all-cause in-hospital deaths among adults aged 65 years and older* increased in April–December 2020 versus the average in April–December 2016–2019 for patients from all income quartiles. The increase was largest among patients from the lowest income quartile (51.0 percent) and smallest for those from the highest income quartile (28.6 percent).

  Across the 29 States, the percentage of in-hospital deaths related to COVID-19 in April–December 2020 ranged from 30.3 percent for patients from communities in the highest income quartile to 36.5 percent for patients from communities in the lowest income quartile.

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–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	1,595,700		59,900	
	Apr–Dec, 2020	1,432,100	11.4%	90,400	36.5%
Middle (Q2–Q3)	Apr–Dec, 2016–2019	3,304,400		117,500	
	Apr–Dec, 2020	2,918,700	9.6%	162,400	33.2%
Highest (Q4)	Apr–Dec, 2016–2019	1,540,600		55,200	
	Apr–Dec, 2020	1,309,000	8.1%	71,000	30.3%

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)

[e] 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 65+ 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)	**6,518,000**	**5,724,000**	**9.7**	**235,400**	**327,400**	**33.4**
Northeast	**1,572,700**	**1,296,000**	**9.3**	**59,100**	**81,100**	**35.2**
CT	115,800	103,500	10.5	5,200	7,300	32.1
ME	46,000	37,900	2.5	1,800	1,800	9.8
NJ	268,900	208,000	12.9	10,400	15,000	47.0
NY	629,200	495,700	8.7	26,300	36,100	33.7
PA	495,300	436,500	8.7	14,700	20,400	33.2
VT	17,400	14,300	1.5	700	600	3.6
Midwest	**2,179,200**	**1,947,400**	**10.5**	**70,500**	**100,800**	**34.5**
IA	95,900	85,000	12.2	2,800	4,100	38.3
IL	393,100	347,200	12.1	12,300	19,200	38.6
IN	216,400	196,300	11.3	7,200	10,100	35.8
KS	90,900	84,100	9.7	2,800	4,000	32.2
MI	361,200	310,700	9.6	12,700	18,400	33.3
MN	161,000	139,400	9.0	4,900	6,100	29.5
MO	219,700	201,000	10.4	7,900	11,200	33.2
ND	24,600	22,500	11.3	1,100	1,500	37.3
OH	423,400	383,900	9.6	12,900	18,000	32.5
SD	29,600	27,800	13.5	900	1,500	41.7
WI	163,200	149,400	10.7	4,900	6,900	33.2
South	**1,412,100**	**1,276,700**	**10.1**	**52,500**	**74,600**	**31.7**
GA	265,600	248,300	11.3	8,300	13,800	34.2
KY	154,700	137,000	9.0	6,400	8,400	27.2
LA	134,400	128,800	13.0	4,800	7,700	39.8
MD	155,300	126,600	10.0	5,700	7,400	35.0
MS	101,800	91,300	13.5	3,600	6,000	39.0
SC	149,300	133,800	10.1	5,700	7,600	31.9
TN	216,300	202,100	9.4	8,700	11,900	28.5
VA	234,700	208,900	7.0	9,400	11,900	24.2
West	**1,354,000**	**1,203,900**	**8.4**	**53,300**	**70,900**	**31.8**
AZ	180,400	175,300	10.9	5,000	9,300	43.6
CA	895,800	785,900	9.1	36,900	48,700	33.7
OR	107,000	94,100	3.5	4,000	4,300	13.1
WA	170,800	148,600	4.8	7,400	8,500	17.3

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)

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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 aged 65 years and older 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. population aged 65 years and older: 67.3 percent of the total population, 68.0 percent of the non-Hispanic White population, 69.8 percent of the non-Hispanic Black population, 55.0 percent of the Hispanic population, and 72.0 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.[5,6] 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,[f] 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

[f] 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.[g] 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

[g] 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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