HEALTHCARE COST AND UTILIZATION PROJECT

Agency for Healthcare Research and Quality

STATISTICAL BRIEF #224

June 2017

Patient Characteristics of Opioid-Related Inpatient Stays and Emergency Department Visits Nationally and by State, 2014

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Introduction

Between 2005 and 2014 there was a dramatic increase nationally in hospitalizations involving opioids: the rate of opioid-related inpatient stays increased 64 percent, and the rate of opioid-related emergency department (ED) visits nearly doubled.[1] In a series of Statistical Briefs, the Agency for Healthcare Research and Quality (AHRQ) is providing descriptive information on opioid-related hospitalizations nationally and at the State level, based on data from the Healthcare Cost and Utilization Project (HCUP) Fast Stats online tool.[2] In a previous Statistical Brief, AHRQ reported that across States in 2014 the rate of opioid-related inpatient stays varied more than five-fold and the rate of opioid-related ED visits varied more than ten-fold.[3] Rates were reported for each State at the overall State level.

This HCUP Statistical Brief extends the previous report by presenting data from HCUP Fast Stats on the rate of opioid-related hospital inpatient stays and ED visits by patient sex and age group from 2005 to 2014. The patient sex and age groups with the highest opioid-related inpatient stay rates are presented for each of 44 States and the District of Columbia that provided inpatient data in 2014. Similarly, the patient sex and age groups with the highest opioid-related ED visit rates are presented for each of 30 States that provided ED visit data in 2014. Finally, States are ranked overall on the rates of opioid-related inpatient stays and ED visits by patient sex and age group in 2014. Identification of opioid-related stays and visits is based on all-listed diagnoses and includes events associated with prescription opioids or illicit opioids such as heroin. The population denominator specific to each sex or age group was used to calculate rates.

[1] Weiss AJ, Elixhauser A, Barrett ML, Steiner CA, Bailey MK, O'Malley L. Opioid-Related Inpatient Stays and Emergency Department Visits by State, 2009–2014. HCUP Statistical Brief #219. December 2016. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/reports/statbriefs/sb219-Opioid-Hospital-Stays-ED-Visits-by-State.pdf. Accessed February 9, 2017.
[2] Agency for Healthcare Research and Quality. HCUP Fast Stats Web site, Opioid-Related Hospital Use path. www.hcup-us.ahrq.gov/faststats/landing.jsp. Accessed January 26, 2017.
[3] Weiss et al., 2016. Op. cit.

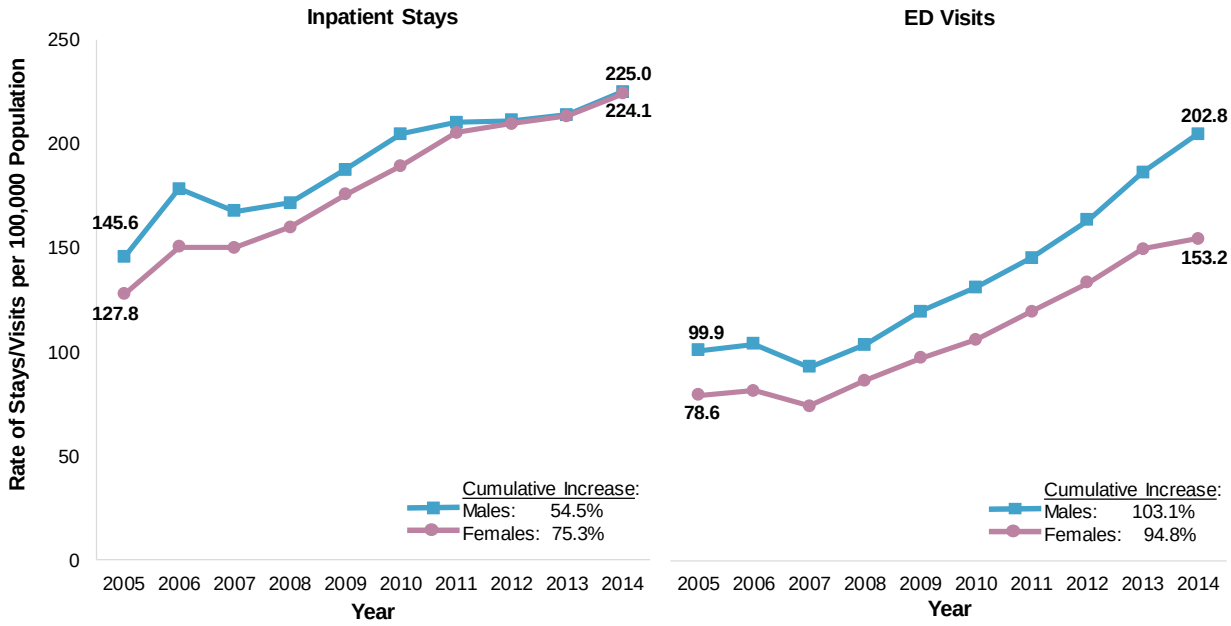
Highlights

- Between 2005 and 2014, opioid-related inpatient stays and ED visits increased for both sexes and all age groups.
- During this timeframe, the national rate of opioid-related inpatient stays increased more for females than for males. Although the rate for males was higher in 2005, by 2014 the rate was the same for both sexes. In contrast, the increase in the rate of opioid-related ED visits was similar for males and females, with males always having the higher rate.
- In most States in 2014, females had a higher rate of opioid-related inpatient stays than males but males had a higher rate of opioid-related ED visits than females.
- From 2005 to 2014, the highest rates of opioid-related inpatient stays nationally were among patients aged 25–44 and 45–64 years. The highest rate of opioid-related ED visits was among those aged 25–44 years.
- In 2014, there was substantial State-to-State variation in the age group with the highest rate of opioid-related inpatient stays, but patients aged 25–44 years had the highest opioid-related ED visit rate in all States.
- Across all patient sex and age groups in 2014:
  - Opioid-related inpatient stays were lowest in Iowa, Nebraska, Texas, and Wyoming and highest in Massachusetts.
  - Opioid-related ED visits were lowest in Arkansas and Iowa and highest in Maryland.

Findings

National rate of opioid-related inpatient stays and ED visits by patient sex, 2005–2014
Figure 1 presents the 10-year trends in the national rate of opioid-related inpatient stays and ED visits by patient sex, from 2005 to 2014.

Figure 1. National rate of opioid-related inpatient stays and ED visits by patient sex, 2005–2014



Abbreviation: ED, emergency department

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP National (Nationwide) Inpatient Sample (NIS) and the Nationwide Emergency Department Sample (NEDS)

- **From 2005 to 2014, the rate of opioid-related inpatient stays increased faster for females than for males. By 2014, the rate was virtually the same for both sexes.**

  In 2005, males had a higher rate of opioid-related inpatient stays than did females (145.6 vs. 127.8 per 100,000 population). Between 2005 and 2014, the rate of opioid-related inpatient stays increased 55 percent for males and 75 percent for females. By 2014, the rates of opioid-related inpatient stays for males and for females converged and were virtually identical (225.0 vs. 224.1 per 100,000 population).

- **The increase in the opioid-related ED visit rate was similar for both sexes, with males consistently experiencing a higher ED visit rate than females.**

  In 2005, males had a higher rate of opioid-related ED visits than did females (99.9 vs. 78.6 per 100,000 population). Between 2005 and 2014, the rate of opioid-related ED visits approximately doubled for both sexes (males: 103 percent increase; females: 95 percent increase). In 2014, males still had a higher rate of opioid-related ED visits than did females (202.8 vs. 153.2 per 100,000 population).

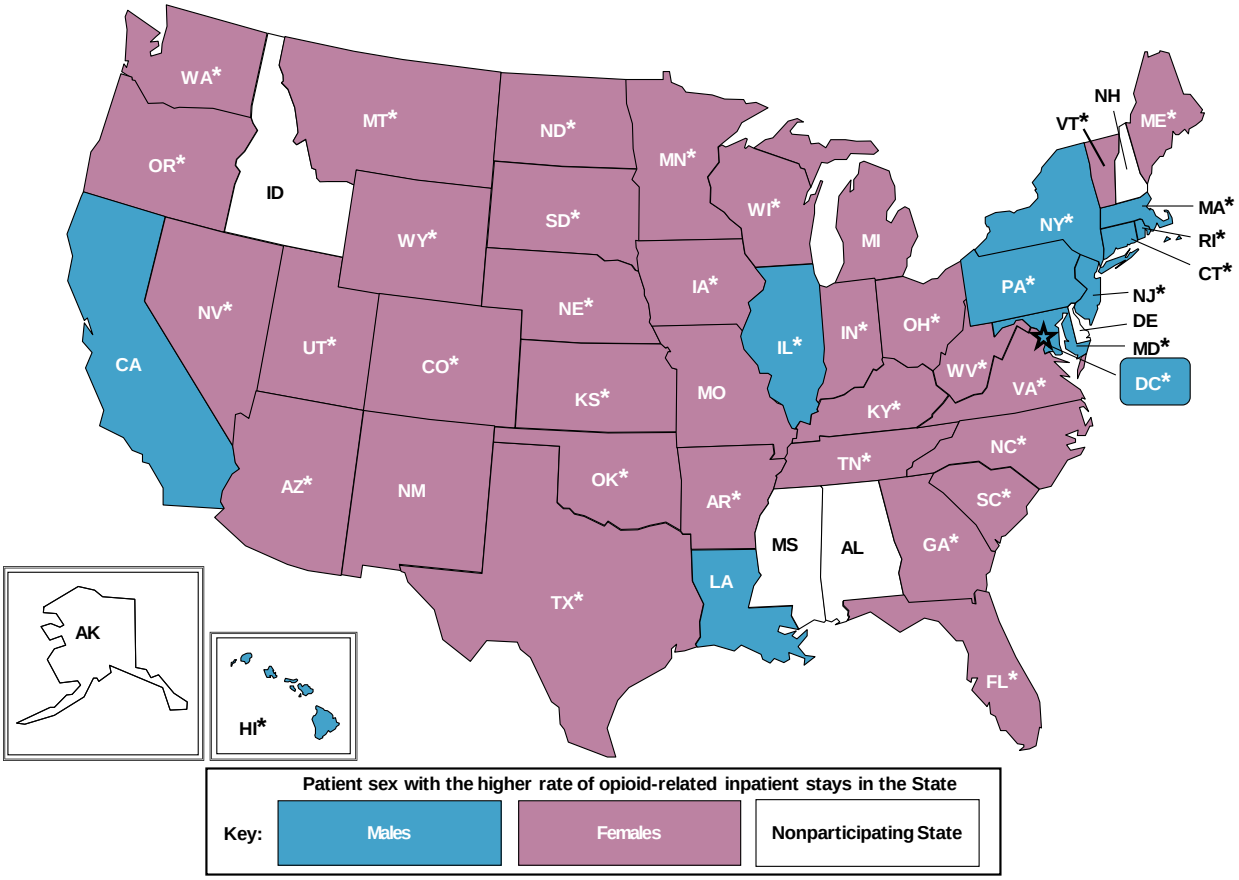
- **For both sexes, the opioid-related ED visit rate increased faster over the 10 years than the opioid-related inpatient stay rate.**

  Between 2005 and 2014, the rate of opioid-related ED visits increased faster than the rate of opioid-related inpatient stays for both males (103 vs. 55 percent increase) and females (95 vs. 75 percent increase).

Patient sex with the higher rate of opioid-related inpatient stays and ED visits, by State, 2014
Figures 2 and 3 identify the patient sex with the higher rate of opioid-related inpatient stays (Figure 2) and ED visits (Figure 3) in each State in 2014. The sex with the higher rate overall is reported for each State. States where the difference between the male and female rates was 10 percent or greater are noted with an asterisk.

Figure 2 reports the patient sex with the higher population rate of opioid-related inpatient stays for each of 44 States and the District of Columbia that provided inpatient data in 2014. Details on the sex-specific inpatient rates are shown in Appendix A.

Figure 2. Patient sex with the higher rate[a] of opioid-related inpatient stays, by State, 2014



Note: Asterisks denote States where the difference between the higher and lower of the male and female rates was at least 10 percent.

[a] Opioid-related inpatient rates are per 100,000 population. State-level inpatient rates by sex are provided in Appendix A.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP State Inpatient Databases (SID)

- **In 2014, females had a higher rate of opioid-related inpatient stays than did males in the majority of States.**

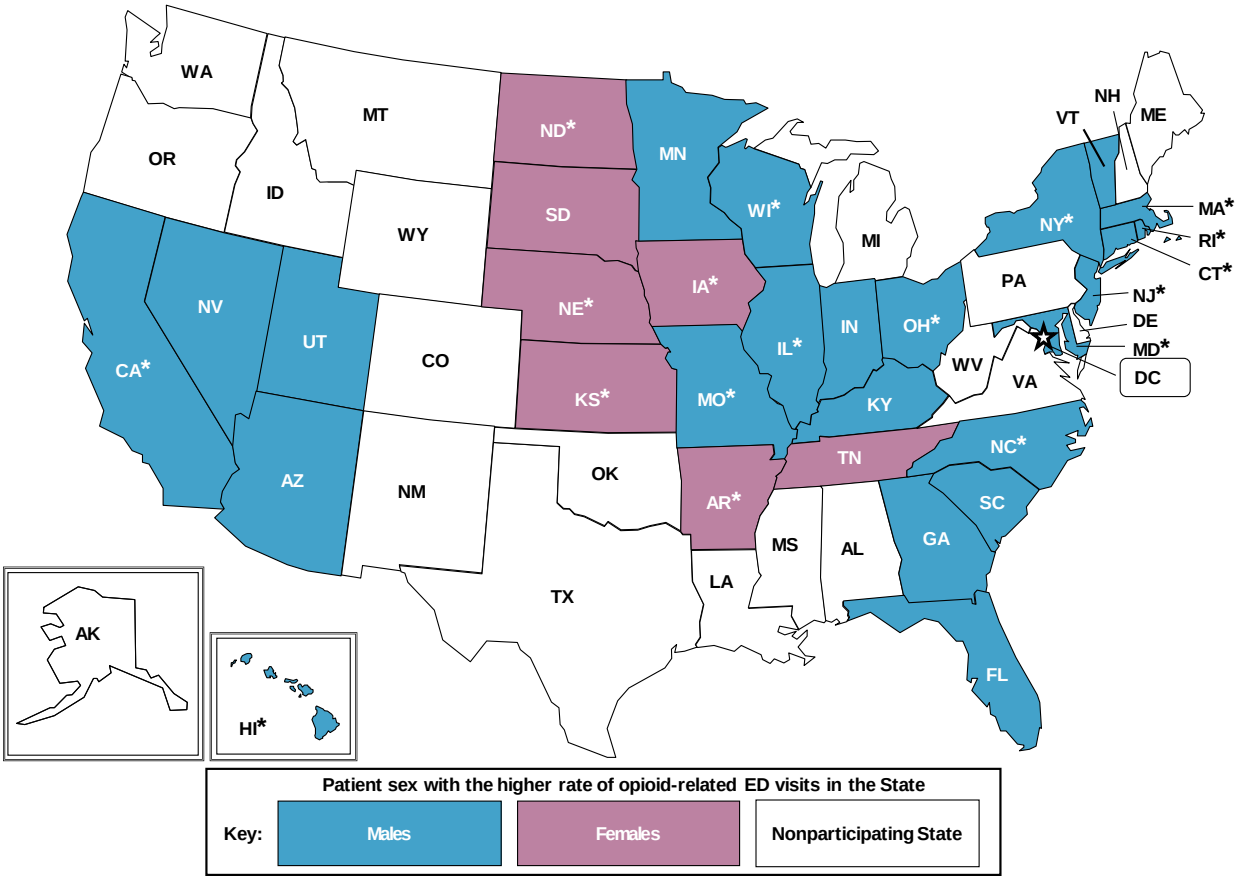
  In 2014, the rate of opioid-related inpatient stays was higher among—

  - Females in nearly three-fourths of States (33 of 45 States, with an average across these States of 221.2 per 100,000 population, data not shown)
  - Males in 11 States and the District of Columbia (average 339.9 per 100,000 population)

  The average rate for both sexes was higher in States where males had a higher rate than females.

Figure 3 reports the patient sex with the higher population rate of opioid-related ED visits for each of 30 States that provided ED data in 2014. Details on the sex-specific ED visit rates are shown in Appendix B.

Figure 3. Patient sex with the higher rate[a] of opioid-related ED visits, by State, 2014



Abbreviation: ED, emergency department

Note: Asterisks denote States where the difference between the higher and lower of the male and female rates was at least 10 percent.

[a] Opioid-related ED visit rates are per 100,000 population. State-level ED visit rates by sex are provided in Appendix B.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP State Emergency Department Databases (SEDD)

- **In contrast to inpatient stays, males had a higher rate of opioid-related ED visits than did females in most States.**

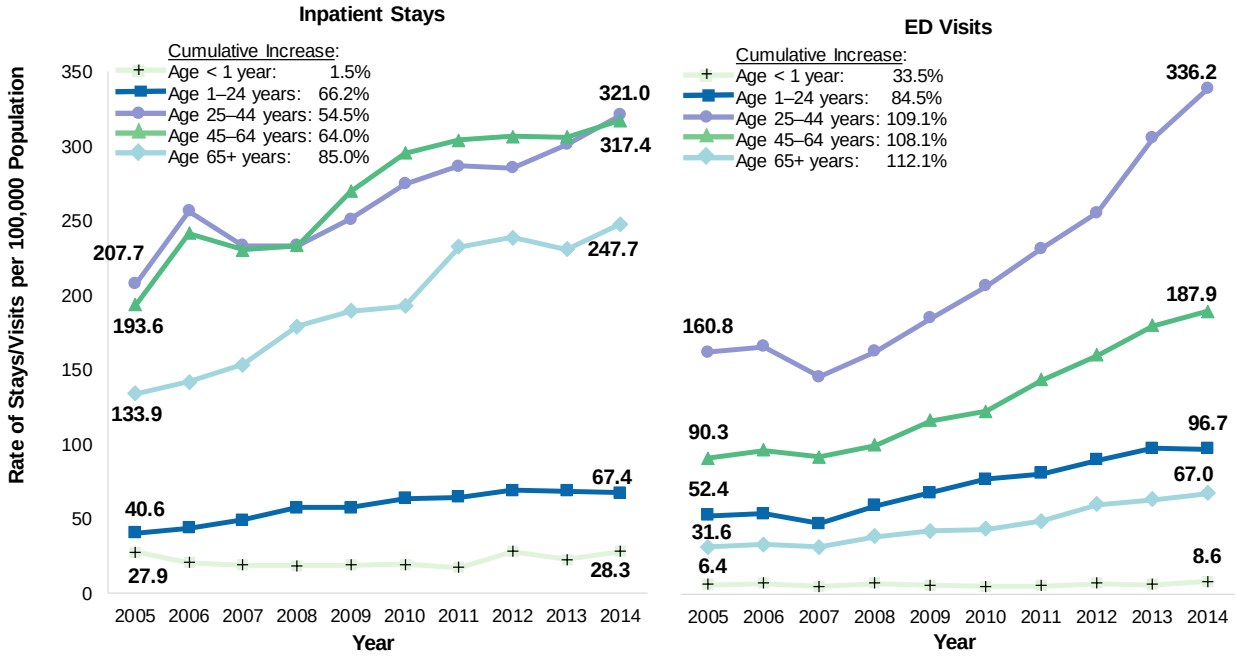
  In 2014, the rate of opioid-related ED visits was higher among—

  - Males in three-fourths of States (23 of 30 States, with an average across these States of 226.0 per 100,000 population, data not shown)
  - Females in seven States (average 87.5 per 100,000 population)

  The average rate for both sexes was higher in States where males had a higher rate than females.

National rate of opioid-related inpatient stays and ED visits by patient age, 2005–2014
Figure 4 presents the 10-year trends in the national rate of opioid-related inpatient stays and ED visits by patient age group, from 2005–2014.

Figure 4. National rate of opioid-related inpatient stays and ED visits by patient age, 2005–2014



Abbreviation: ED, emergency department

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP National (Nationwide) Inpatient Sample (NIS) and the Nationwide Emergency Department Sample (NEDS)

- **The highest rates of opioid-related inpatient stays were among patients aged 25–44 and 45–64 years, whereas the highest rate of opioid-related ED visits was among patients aged 25–44 years.**

  For opioid-related inpatient stays, patients aged 25–44 and 45–64 years had the highest and nearly identical rates throughout 2005 to 2014. Patients aged 65 years and older had the next highest rate of opioid-related inpatient stays over time. For opioid-related ED visits, patients aged 25–44 years had the highest rate, followed by patients aged 45–64 years and those aged 1–24 years.

- **For all age groups, the rate of increase over 10 years was greater for opioid-related ED visits than for opioid-related inpatient stays.**

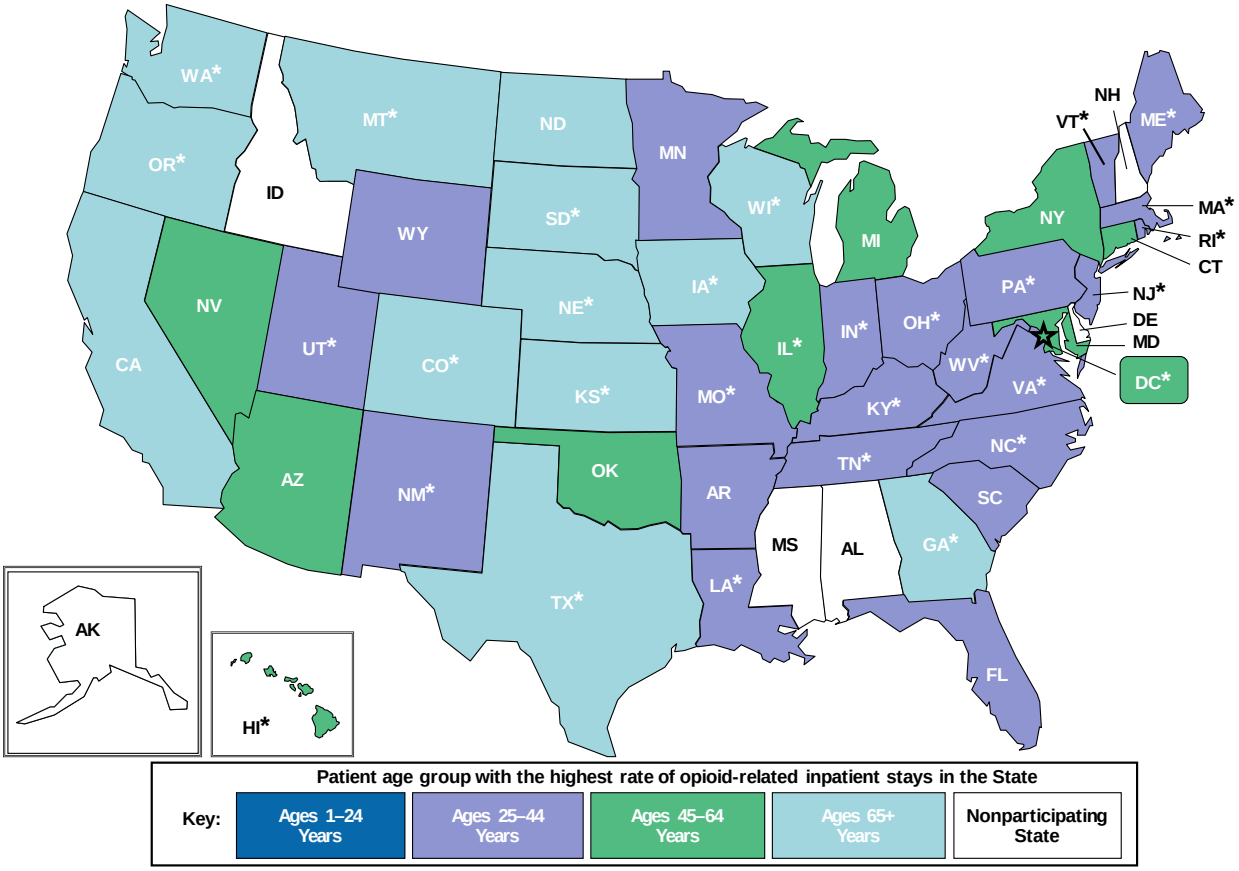
  Between 2005 and 2014 for all age groups, the rate of opioid-related ED visits increased faster than the rate of opioid-related inpatient stays. For example, over the 10-year period for patients aged 25–44 years, the rate of opioid-related ED visits increased 109 percent whereas the rate of opioid-related inpatient stays increased 55 percent.

- **The rate of opioid-related inpatient stays was consistently higher than the rate of opioid-related ED visits among patients younger than 1 year of age, those aged 45–64 years, and those aged 65 years and older, but not among those aged 1–24 and 25–44 years.**

  Among patients aged less than 1 year, 45–64 years, and 65 years and older, the rate of opioid-related inpatient stays exceeded the rate of opioid-related ED visits from 2005 to 2014. The reverse was true for patients aged 1–24 years, with a higher opioid-related ED visit rate over this time period. Among those aged 25–44 years, the rate of opioid-related inpatient stays was higher than the rate of opioid-related ED visits from 2005 to 2012, but by 2013 the rate of opioid-related ED visits was higher.

Patient age group with the highest rate of opioid-related inpatient stays and ED visits, by State, 2014
Figures 5 and 6 identify the patient age group with the highest rate of opioid-related inpatient stays (Figure 5) and ED visits (Figure 6) in each State in 2014. The age group with the highest rate overall is reported for each State. States where the difference between the highest and second highest rates was 10 percent or greater are noted with an asterisk. Figure 5 reports the patient age group with the highest population rate of opioid-related inpatient stays for each of 44 States and the District of Columbia in 2014. Details on the age-specific inpatient rates are shown in Appendix A.

Figure 5. Patient age group with the highest rate[a] of opioid-related inpatient stays, by State, 2014



Note: Asterisks denote States where the difference between the highest and second highest rates in the State was at least 10 percent.

[a] Opioid-related inpatient rates are per 100,000 population. State-level inpatient rates by age group are provided in Appendix A.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP State Inpatient Databases (SID)

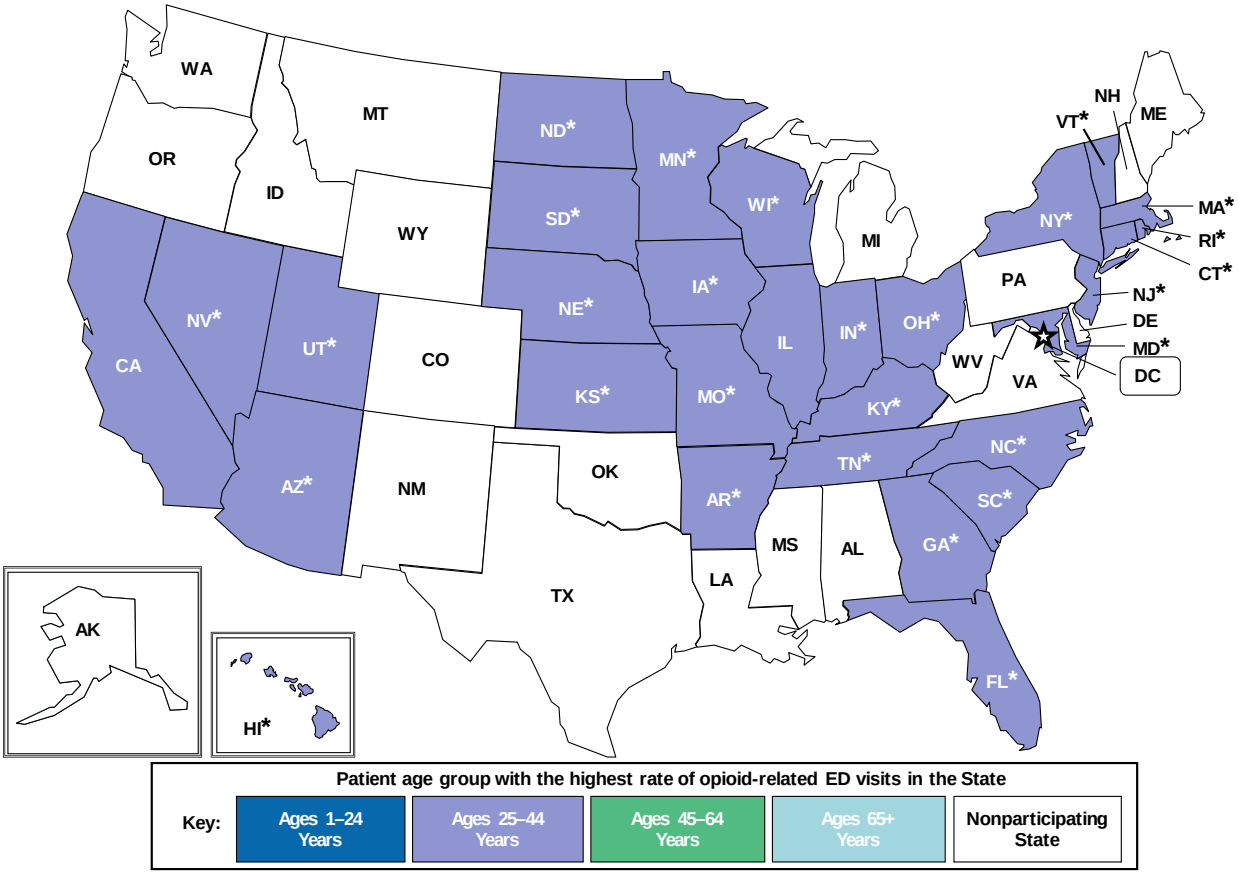
- **There was substantial variation in the age group that had the highest rate of opioid-related inpatient stays across States in 2014.**

  In 2014, the rate of opioid-related inpatient stays was highest among patients—
  - Aged 25–44 years in approximately half of the States (22 of 45 States, with an average across these States of 414.4 per 100,000 population, data not shown)
  - Aged 45–64 years in 9 States and the District of Columbia (average 491.5 per 100,000 population)
  - Aged 65+ years in 13 States (average 290.0 per 100,000 population)

  There were no States where patients aged 1–24 years had the highest rate.

Figure 6 reports the patient age group with the highest population rate of opioid-related ED visits for each of 30 States that provided data in 2014. Details on the age-specific ED visit rates are shown in Appendix B.

Figure 6. Patient age group with the highest rate[a] of opioid-related ED visits, by State, 2014



Abbreviation: ED, emergency department

Note: Asterisks denote States where the difference between the highest and second highest rates in the State was at least 10 percent.

[a] Opioid-related ED visit rates are per 100,000 population. State-level ED visit rates by age group are provided in Appendix B.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP State Emergency Department Databases (SEDD)

- **Patients aged 25–44 years had the highest opioid-related ED visit rate in all States in 2014.**

  In 2014, the rate of opioid-related ED visits was highest among patients aged 25–44 years in all 30 States for which ED visit data were available.

State rankings in rate of opioid-related inpatient stays and ED visits by patient sex and age group, 2014
Tables 1 and 2 present the relative State rankings in the rate of opioid-related inpatient stays (Table 1) and ED visits (Table 2) by patient sex and age group in 2014. State rankings in each patient subgroup are reported based on four quartiles:

- Lowest rates, corresponding to the bottom 25 percent, noted with a partially filled circle (⊙)
- Highest rates, corresponding to the top 25 percent, noted with a solid circle (●)
- Neither the lowest nor highest rates, corresponding to the middle 50 percent, noted with a dash

Table 1 reports the relative ranking of opioid-related inpatient stays for each of 44 States and the District of Columbia that provided data in 2014.

Table 1. Ranking in State rates[a] of opioid-related inpatient stays, by patient sex and age, 2014

Key:
● States with the **highest opioid-related inpatient rates** (top 25 percent) in the patient subgroup
— States with opioid-related inpatient rates in the middle 50 percent in the patient subgroup
⊙ States with the **lowest opioid-related inpatient rates** (bottom 25 percent) in the patient subgroup

State	Males	Females	Ages 1–24 years	Ages 25–44 years	Ages 45–64 years	Ages 65+ years
Arizona	—	—	—	—	●	●
Arkansas	⊙	⊙	⊙	—	—	⊙
California	—	—	⊙	⊙	—	●
Colorado	—	—	—	—	—	●
Connecticut	●	●	—	●	●	●
District of Columbia	●	●	—	⊙	●	●
Florida	—	—	—	—	—	—
Georgia	⊙	⊙	⊙	⊙	⊙	—
Hawaii	—	⊙	⊙	⊙	—	⊙
Illinois	●	—	—	—	●	—
Indiana	—	—	—	—	—	—
Iowa	⊙	⊙	⊙	⊙	⊙	⊙
Kansas	⊙	⊙	⊙	⊙	⊙	—
Kentucky	—	●	●	●	—	⊙
Louisiana	—	⊙	—	—	⊙	⊙
Maine	—	●	●	●	—	—
Maryland	●	●	●	●	●	—
Massachusetts	●	●	●	●	●	●
Michigan	—	—	—	—	—	—
Minnesota	—	—	●	—	—	●
Missouri	—	—	—	—	—	—
Montana	—	—	—	—	—	●
Nebraska	⊙	⊙	⊙	⊙	⊙	⊙
Nevada	—	—	—	⊙	—	—
New Jersey	●	—	●	●	●	—
New Mexico	—	—	—	—	—	—
New York	●	—	●	●	●	—
North Carolina	—	—	—	—	—	—

State	Males	Females	Ages 1–24 years	Ages 25–44 years	Ages 45–64 years	Ages 65+ years
North Dakota	⊙	—	—	—	⊙	—
Ohio	—	●	●	●	—	—
Oklahoma	⊙	—	—	—	—	—
Oregon	—	●	—	—	●	●
Pennsylvania	●	—	—	●	—	—
Rhode Island	●	●	—	●	●	—
South Carolina	⊙	⊙	⊙	—	⊙	⊙
South Dakota	⊙	⊙	⊙	⊙	⊙	—
Tennessee	—	—	—	—	—	—
Texas	⊙	⊙	⊙	⊙	⊙	⊙
Utah	—	—	—	—	—	—
Vermont	—	—	●	—	⊙	⊙
Virginia	—	—	—	—	—	—
Washington	●	●	●	—	●	●
West Virginia	●	●	●	●	—	⊙
Wisconsin	—	—	—	—	—	●
Wyoming	⊙	⊙	⊙	⊙	⊙	⊙

[a] Opioid-related inpatient rates are per 100,000 population. The actual inpatient rates for both sexes and each age group by State are provided in Appendix A.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP State Inpatient Databases (SID)

- **Some States consistently ranked lowest or highest in rates of opioid-related inpatient stays in all patient sex and age groups in 2014.**

  Four States consistently ranked as having among the lowest rates of opioid-related inpatient stays across all patient sex and age groups: Iowa, Nebraska, Texas, and Wyoming. Similarly, Georgia, Kansas, South Carolina, and South Dakota ranked among the States with the lowest rates in all but one sex or age group.

  One State, Massachusetts, consistently ranked as having among the highest rates of opioid-related inpatient stays across all patient sex and age groups. Connecticut, Maryland, and Washington ranked among the States with the highest rates in all but one sex or age group.

- **Some States ranked lowest for opioid-related inpatient stays for some patient sex and age groups but highest for other patient sex and age groups.**

  Some States had consistently high rates or consistently low rates of inpatient stays for some age and sex groups. However, other States had high rates for some patient subgroups and low rates for other patient subgroups. For instance, California had among the lowest rates of opioid-related inpatient stays for patients aged 1–24 and 25–44 years but ranked among the States with the highest rates for patients aged 65 years and older. In contrast, Kentucky and West Virginia ranked among the States with the highest rates for the two younger age groups but among the States with the lowest rates for the oldest age group.

Table 2 reports the relative rankings of opioid-related ED visits for each of 30 States that provided data in 2014.

Table 2. Ranking in State rates[a] of opioid-related ED visits, by patient sex and age, 2014

Key:
● States with the **highest opioid-related ED visit rates** (top 25 percent) in the patient subgroup
— States with opioid-related ED visit rates in the middle 50 percent in the patient subgroup
⊙ States with the **lowest opioid-related ED visit rates** (bottom 25 percent) in the patient subgroup

State	Males	Females	Ages 1–24 years	Ages 25–44 years	Ages 45–64 years	Ages 65+ years
Arizona	—	●	—	—	●	●
Arkansas	⊙	⊙	⊙	⊙	⊙	⊙
California	—	—	—	—	—	●
Connecticut	●	—	●	●	●	⊙
Florida	—	—	—	—	—	⊙
Georgia	⊙	⊙	⊙	⊙	⊙	—
Hawaii	—	⊙	⊙	⊙	—	—
Illinois	—	—	—	—	●	—
Indiana	—	—	—	—	—	—
Iowa	⊙	⊙	⊙	⊙	⊙	⊙
Kansas	⊙	⊙	⊙	⊙	⊙	—
Kentucky	—	●	●	●	—	—
Maryland	●	●	●	●	●	●
Massachusetts	●	●	●	●	●	⊙
Minnesota	—	—	—	—	—	—
Missouri	—	—	—	—	—	—
Nebraska	⊙	⊙	⊙	⊙	⊙	—
Nevada	—	—	—	—	—	●
New Jersey	●	—	—	—	●	⊙
New York	●	—	—	—	—	⊙
North Carolina	—	—	—	—	—	●
North Dakota	⊙	—	—	—	⊙	—
Ohio	●	●	●	●	—	—
Rhode Island	●	●	●	●	●	—
South Carolina	—	—	—	—	—	—
South Dakota	⊙	⊙	⊙	⊙	⊙	—
Tennessee	—	—	—	—	—	●
Utah	—	—	—	—	—	●
Vermont	—	●	●	●	—	—
Wisconsin	—	—	—	—	—	—

Abbreviation: ED, emergency department

[a] Opioid-related ED visit rates are per 100,000 population. The actual ED visit rates for both sexes and each age group by State are provided in Appendix B.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP State Emergency Department Databases (SEDD)

- **Some States consistently ranked lowest or highest in rates of opioid-related ED visits in all patient sex and age groups in 2014.**

  Two States consistently ranked as having among the lowest rates of opioid-related ED visits across all patient sex and age groups: Arkansas and Iowa. Similarly, Georgia, Kansas, Nebraska, and South Dakota ranked among the States with the lowest rates in all but one sex and age group. One State, Maryland, consistently ranked as having among the highest rates of opioid-related ED visits across all patient sex and age groups. Massachusetts and Rhode Island ranked among the States with the highest rates in all but one sex or age group.

- **Some States ranked lowest in rates of opioid-related ED visits for some patient sex and age groups but highest for other patient sex and age groups.**

  Some States had consistently high rates or consistently low rates of ED visits for some age and sex groups. However, other States had high rates for some patient subgroups and low rates for other patient subgroups. For instance, Connecticut and Massachusetts had among the highest rates of opioid-related ED visits for patients aged 1–24, 25–44, and 45–64 years but ranked among the States with the lowest rates for patients aged 65 years and older.

Appendix A. State-level rates[a] of opioid-related inpatient stays, by patient sex and age group, 2014

State	Males	Females	Ages 1–24 years	Ages 25–44 years	Ages 45–64 years	Ages 65+ years
Arizona	229.7	264.1	65.9	275.8	399.0	371.2
Arkansas	118.0	159.8	37.9	206.0	194.2	160.9
California	168.8	167.9	40.4	159.3	286.1	303.1
Colorado	166.0	206.4	58.5	192.4	263.6	353.7
Connecticut	377.3	299.8	78.3	490.3	515.5	297.3
District of Columbia	472.0	312.8	62.2	186.3	1138.8	330.8
Florida	219.8	249.3	67.1	335.9	331.7	232.6
Georgia	104.5	133.9	27.1	135.4	185.9	214.4
Hawaii	163.6	119.3	36.7	163.1	233.4	161.8
Illinois	349.2	265.4	54.6	365.7	598.7	249.6
Indiana	176.7	216.4	63.5	320.9	240.1	226.3
Iowa	63.0	82.3	20.1	75.8	95.3	143.8
Kansas	87.2	121.2	23.9	127.5	148.9	185.9
Kentucky	255.8	304.2	112.4	561.4	280.3	175.1
Louisiana	155.7	155.1	52.9	287.3	176.2	132.5
Maine	273.6	326.3	115.6	620.4	254.7	274.8
Maryland	442.7	367.2	100.8	592.2	640.7	284.7
Massachusetts	433.4	356.3	132.3	689.0	466.8	307.6
Michigan	222.3	236.6	61.1	330.6	336.6	239.3
Minnesota	228.2	266.0	106.1	325.4	309.1	324.2
Missouri	259.8	263.0	92.0	461.8	298.7	243.8
Montana	163.4	264.2	50.2	269.3	273.6	351.9
Nebraska	63.4	93.5	26.6	85.6	105.4	145.7
Nevada	150.1	198.5	51.2	185.7	272.4	267.5
New Jersey	327.3	251.9	97.7	470.3	398.5	182.6
New Mexico	205.4	225.2	83.6	340.7	266.7	219.9
New York	467.1	260.2	118.7	533.0	555.7	213.9
North Carolina	198.8	240.0	78.4	333.6	273.1	247.8
North Dakota	133.4	190.4	55.2	231.3	184.1	244.7
Ohio	276.6	306.7	109.8	565.4	314.6	209.9
Oklahoma	122.9	186.7	45.9	199.4	224.2	221.2
Oregon	266.9	346.4	62.8	296.9	435.6	599.9
Pennsylvania	299.8	271.0	94.6	506.5	339.0	237.1
Rhode Island	421.8	335.8	86.9	623.6	540.1	281.2
South Carolina	123.8	158.3	37.5	200.7	191.9	182.1
South Dakota	108.6	148.2	45.5	163.8	154.8	218.4
Tennessee	222.9	279.2	83.7	372.7	336.4	261.3
Texas	90.9	106.1	29.5	115.5	147.2	178.2
Utah	189.7	219.3	69.9	325.0	288.4	270.6
Vermont	147.6	257.4	95.3	449.0	147.4	170.4
Virginia	156.2	176.5	55.8	238.6	211.3	206.5
Washington	279.1	347.2	102.2	368.9	416.9	505.4
West Virginia	326.7	371.2	168.5	739.9	320.9	177.6
Wisconsin	187.1	238.2	73.8	294.0	247.1	324.5
Wyoming	74.0	118.1	24.4	142.5	125.8	133.9

[a] Opioid-related inpatient rates are per 100,000 population.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP State Inpatient Databases (SID)

Appendix B. State-level rates[a] of opioid-related ED visits, by patient sex and age group, 2014

State	Males	Females	Ages 1–24 years	Ages 25–44 years	Ages 45–64 years	Ages 65+ years
Arizona	224.4	205.4	128.5	358.1	255.0	112.6
Arkansas	63.3	79.6	35.3	130.1	81.6	41.5
California	169.0	144.0	74.3	228.6	214.9	110.9
Connecticut	323.7	188.9	157.2	549.1	231.1	47.2
Florida	110.5	107.8	59.7	220.3	111.7	41.2
Georgia	96.3	94.5	48.4	166.1	101.6	64.9
Hawaii	130.9	93.5	46.8	179.1	158.4	56.9
Illinois	204.4	135.0	70.5	272.9	248.9	62.0
Indiana	159.6	145.1	95.6	316.4	124.4	61.1
Iowa	37.0	53.1	22.4	69.2	51.4	47.9
Kansas	70.7	91.4	36.0	147.6	98.6	54.5
Kentucky	230.3	209.4	131.8	494.1	159.8	60.4
Maryland	353.5	251.1	146.9	510.2	398.3	77.1
Massachusetts	598.8	310.4	299.1	1071.3	284.4	41.0
Minnesota	134.6	133.7	88.1	240.6	129.0	66.8
Missouri	187.3	152.2	94.4	362.2	148.2	61.5
Nebraska	47.0	58.2	28.0	82.6	60.2	50.3
Nevada	186.3	179.9	99.4	294.7	219.8	101.1
New Jersey	265.4	166.1	115.4	401.2	250.0	45.1
New York	252.0	123.5	109.6	340.8	204.8	40.2
North Carolina	187.8	169.5	109.6	351.0	157.5	73.1
North Dakota	86.4	114.7	61.2	191.5	94.3	54.2
Ohio	319.6	257.6	178.1	686.8	202.2	54.7
Rhode Island	383.0	218.9	166.0	625.2	294.4	64.7
South Carolina	109.5	102.3	52.1	209.9	108.4	49.1
South Dakota	61.2	65.0	33.8	118.5	59.5	51.0
Tennessee	140.3	150.7	72.5	272.8	152.4	78.6
Utah	179.4	166.8	91.3	330.1	169.4	95.3
Vermont	226.7	220.8	139.5	558.1	145.3	68.9
Wisconsin	165.0	148.8	103.7	333.6	118.7	59.9

[a] Opioid-related ED visit rates are per 100,000 population.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), HCUP Fast Stats, Opioid-Related Hospital Use (www.hcup-us.ahrq.gov/faststats/landing.jsp) based on the HCUP State Emergency Department Databases (SEDD)

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2005–2014 National (Nationwide) Inpatient Sample (NIS), 2005–2014 Nationwide Emergency Department Sample (NEDS), 2014 State Inpatient Databases (SID), and 2014 State Emergency Department Databases (SEDD). The statistics were generated from HCUP Fast Stats, a free, online tool that provides users with easy access to the latest HCUP-based statistics for health information topics, including opioid-related hospital use.[4]

Inpatient statistics from HCUP Fast Stats were available for the following 44 individual States and the District of Columbia in 2014: Arizona, Arkansas, California, Colorado, Connecticut, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

Emergency department (ED) statistics from HCUP Fast Stats were available for the following 30 individual States in 2014: Arizona, Arkansas, California, Connecticut, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, and Wisconsin.

Rates are presented in HCUP Fast Stats using population data obtained from Claritas, a vendor that compiles and adds value to data from the U.S. Census Bureau.[5]

Definitions

Diagnoses and ICD-9-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 concomitant conditions that coexist at the time of admission or develop during the stay. *All-listed diagnoses* include the principal diagnosis plus these additional secondary conditions.

ICD-9-CM is the International Classification of Diseases, Ninth Revision, Clinical Modification, which assigns numeric codes to diagnoses. There are approximately 14,000 ICD-9-CM diagnosis codes.

Case definition
Opioid-related hospital use was identified using the following all-listed ICD-9-CM diagnosis codes:

- 304.00–304.02: Opioid type dependence (unspecified; continuous; episodic)
- 304.70–304.72: Combinations of opioid type drug with any other drug dependence (unspecified; continuous; episodic)
- 305.50–305.52: Opioid abuse (unspecified; continuous; episodic)
- 965.00–965.02; 965.09: Poisoning by opium (alkaloids), unspecified; heroin; methadone; other opiates and related narcotics
- 970.1: Poisoning by opiate antagonists
- E850.0–E850.2: Accidental poisoning by heroin; methadone; other opiates and related narcotics
- E935.0–E935.2: Heroin, methadone, other opiates and related narcotics causing adverse effects in therapeutic use
- E940.1: Opiate antagonists causing adverse effects in therapeutic use

[4] Agency for Healthcare Research and Quality. HCUP Fast Stats Web site, Opioid-Related Hospital Use path. www.hcup-us.ahrq.gov/faststats/landing.jsp. Accessed January 26, 2017.
[5] Claritas. Claritas Demographic Profile. www.claritas.com. Accessed June 23, 2017.

It should be noted that ICD-9-CM diagnosis codes related to opioid dependence or abuse "in remission" were not used to identify opioid-related hospital use because remission does not indicate active use of opioids. Potential changes in the use of ICD-9-CM codes identifying opioid use cannot be isolated in these analyses.

These codes include opioid-related use stemming from illicit opioids such as heroin, illegal use of prescription opioids, and the use of opioids as prescribed. Each type of opioid use is important for understanding and addressing the opioid epidemic in the United States.[6] While there may be interest in examining how much each type of opioid use contributes to the overall opioid problem, many of the opioid-related codes under the ICD-9-CM clinical coding system do not allow heroin-related cases to be explicitly identified (e.g., in the 304.0x series, heroin is not distinguished from other opioids). In addition, the codes do not distinguish between illegal use of prescription drugs and their use as prescribed.

Types of hospitals included in the HCUP National (Nationwide) Inpatient Sample
The National (Nationwide) Inpatient Sample (NIS) is based on data from community hospitals, which are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). The NIS includes obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Excluded are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Beginning in 2012, long-term acute care hospitals are also excluded. 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 will be included in the NIS.

Types of hospitals included in the HCUP Nationwide Emergency Department Sample
The Nationwide Emergency Department Sample (NEDS) is based on data from community hospitals, which are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). The NEDS includes specialty, pediatric, public, and academic medical hospitals. Excluded are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Hospitals included in the NEDS have hospital-owned emergency departments (EDs) and no more than 90 percent of their ED visits resulting in admission.

Types of hospitals included in HCUP State Inpatient Databases
This analysis used State Inpatient Databases (SID) limited to data from community hospitals, which are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). Community hospitals include obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. 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.

Types of hospitals included in HCUP State Emergency Department Databases
This analysis used State Emergency Department Databases (SEDD) limited to data from community hospitals with a hospital-owned emergency department. Community hospitals are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). Community hospitals include specialty, pediatric, public, and academic medical hospitals. Excluded for this analysis are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals.

Unit of analysis
The unit of analysis for inpatient data 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. Inpatient stays include those for patients admitted through the emergency department (ED). Patients transferred between inpatient hospitals are counted only once.

[6] Compton WM, Jones CM, Baldwin GT. Relationship between nonmedical prescription-opioid use and heroin use. The New England Journal of Medicine. 2016;374:154–63.

The unit of analysis for ED data is the ED visit, not a person or patient. This means that a person who is seen in the ED multiple times in 1 year will be counted each time as a separate visit in the ED. ED visits exclude those for patients admitted to the same hospital and also exclude patients transferred to another hospital.

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of health care 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 health care 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 health care 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
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
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 Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About Statistical Briefs

HCUP Statistical Briefs are descriptive summary reports presenting statistics on hospital inpatient, ambulatory surgery, and emergency department use and costs, quality of care, access to care, medical conditions, procedures, patient populations, and other topics. The reports use HCUP administrative health care data.

About the NIS

The HCUP National (Nationwide) Inpatient Sample (NIS) is a nationwide database of hospital inpatient stays. The NIS is nationally representative of all community hospitals (i.e., short-term, non-Federal, nonrehabilitation hospitals). The NIS includes all payers. It is drawn from a sampling frame that contains hospitals comprising more than 95 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use. Over time, the sampling frame for the NIS has changed; thus, the number of States contributing to the NIS varies from year to year. The NIS is intended for national estimates only; no State-level estimates can be produced.

The 2012 NIS was redesigned to optimize national estimates. The redesign incorporates two critical changes:

- Revisions to the sample design—starting with 2012, the NIS is now a *sample of discharge records from all HCUP-participating hospitals*, rather than a sample of hospitals from which all discharges were retained (as is the case for NIS years before 2012).

- Revisions to how hospitals are defined—the NIS now uses the *definition of hospitals and discharges supplied by the statewide data organizations* that contribute to HCUP, rather than the definitions used by the American Hospital Association (AHA) Annual Survey of Hospitals.

The new sampling strategy is expected to result in more precise estimates than those that resulted from the previous NIS design by reducing sampling error: for many estimates, confidence intervals under the new design are about half the length of confidence intervals under the previous design. The change in sample design for 2012 necessitates recomputation of prior years' NIS data to enable analyses of trends that use the same definitions of discharges and hospitals.

About the NEDS

The HCUP Nationwide Emergency Department Database (NEDS) is a unique and powerful database that yields national estimates of emergency department (ED) visits. The NEDS was constructed using records from both the HCUP State Emergency Department Databases (SEDD) and the State Inpatient Databases (SID). The SEDD capture information on ED visits that do not result in an admission (i.e., patients who were treated in the ED and then released from the ED, or patients who were transferred to another hospital); the SID contain information on patients initially seen in the ED and then admitted to the same

hospital. The NEDS was created to enable analyses of ED utilization patterns and support public health professionals, administrators, policymakers, and clinicians in their decisionmaking regarding this critical source of care. The NEDS is produced annually beginning in 2006. Over time, the sampling frame for the NEDS has changed; thus, the number of States contributing to the NEDS varies from year to year. The NEDS is intended for national estimates only; no State-level estimates can be produced.

About the SID

The HCUP State Inpatient Databases (SID) are hospital inpatient databases from data organizations participating in HCUP. The SID contain the universe of the inpatient discharge abstracts in the participating HCUP States, translated into a uniform format to facilitate multistate comparisons and analyses. Together, the SID encompass more than 95 percent of all U.S. community hospital discharges. The SID 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.

About the SEDD

The HCUP State Emergency Department Databases (SEDD) include information from hospital-owned emergency departments (EDs) from data organizations participating in HCUP, translated into a uniform format to facilitate multistate comparisons and analyses. The SEDD capture information on ED visits that do not result in an admission to the same hospital (i.e., patients who are treated in the ED and then discharged, transferred to another hospital, left against medical advice, or died). The SEDD contain a core set of clinical and nonclinical information on all patients, including individuals covered by Medicare, Medicaid, or private insurance, as well as those who are uninsured. The SEDD 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 injury surveillance, emerging infections, and other conditions treated in the ED.

About HCUP Fast Stats

HCUP Fast Stats (www.hcup-us.ahrq.gov/faststats/landing.jsp) is an interactive, online tool that provides easy access to the quarterly HCUP-based statistics for select State and national health information topics. HCUP Fast Stats uses side-by-side comparisons of visual statistical displays, trend figures, or simple tables to convey complex information at a glance. Topics currently available in HCUP Fast Stats include State Trends in Hospital Use by Payer; National Hospital Utilization and Costs; and Opioid-Related Hospital Use, National and State. HCUP Fast Stats presents statistics using data from HCUP's National (Nationwide) Inpatient Sample (NIS), the Nationwide Emergency Department Sample (NEDS), the State Inpatient Databases (SID), and the State Emergency Department Databases (SEDD).

For More Information

For other information on mental health and substance abuse, including opioids, refer to the HCUP Statistical Briefs located at www.hcup-us.ahrq.gov/reports/statbriefs/sb_mhsa.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 health information topics
- HCUPnet, HCUP's interactive query system, at www.hcupnet.ahrq.gov/

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 National (Nationwide) Inpatient Sample, Nationwide Emergency Department Sample (NEDS), State Inpatient Databases (SID), or State Emergency Department Databases (SEDD), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the National (Nationwide) Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated December 2016. www.hcup-us.ahrq.gov/nisoverview.jsp. Accessed January 31, 2017.

Agency for Healthcare Research and Quality. Overview of the Nationwide Emergency Department Sample (NEDS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated December 2016. www.hcup-us.ahrq.gov/nedsoverview.jsp. Accessed January 31, 2017.

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 June 2016. www.hcup-us.ahrq.gov/sidoverview.jsp. Accessed January 31, 2017.

Agency for Healthcare Research and Quality. Overview of the State Emergency Department Databases (SEDD). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated June 2016. www.hcup-us.ahrq.gov/seddoverview.jsp. Accessed January 31, 2017.

Suggested Citation

Weiss AJ (IBM Watson Health), Bailey MK (IBM Watson Health), O'Malley L (IBM Watson Health), Barrett ML (M.L. Barrett, Inc.), Elixhauser A (AHRQ), Steiner CA (Institute for Health Research, Kaiser Permanente). Patient Characteristics of Opioid-Related Inpatient Stays and Emergency Department Visits Nationally and by State, 2014. HCUP Statistical Brief #224. June 2017. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/reports/statbriefs/sb224-Patient-Characteristics-Opioid-Hospital-Stays-ED-Visits-by-State.pdf.

Acknowledgments

The authors would like to acknowledge the contributions of Brian Eppert of Coding Leap, LLC, and Minya Sheng of IBM Watson Health.

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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 health care 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 e-mail us at hcup@ahrq.gov or send a letter to the address below:

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This Statistical Brief was posted online on June 20, 2017.