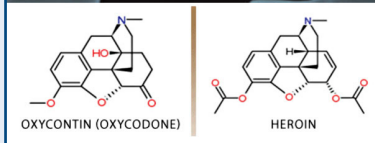
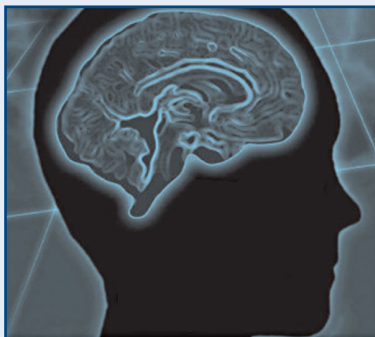




HIDI HealthStats

Statistics and Analysis From the Hospital Industry Data Institute

OCTOBER 2015 ■ ALARMING TRENDS IN HOSPITAL UTILIZATION FOR OPIOID OVERUSE IN MISSOURI



- Hospital utilization for opioid overuse in Missouri increased 137 percent between 2005 and 2014.
- The highest rates of growth were observed among patients who were white, male and under age 30.
- The highest statewide rates of hospital utilization for opioid overuse are in the St. Louis metropolitan area; however, the largest increases during the last 10 years have been in the largely rural Northeast and Southeast regions of the state.
- In 2014, uninsured patients accounted for 30 percent of all hospital visits for opioid overuse – this was a 10-year, 268 percent increase.

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According to a recent national study, inpatient hospitalizations for opioid overuse among adults in the U.S. have increased 153 percent throughout the last 20 years. Missouri has not been shielded from these national trends.

Many commonly-prescribed pain medications are within a family of analgesic opioids, which include oxycodone, hydrocodone, codeine and morphine.ⁱ Because opioids can produce a euphoric response in users by stimulating pleasure centers in the brain, they are a highly addictive form of narcotic pain medication.

The chemical composition of certain opioids is strikingly similar to illicit narcotics, such as heroin (pictured left).^{iv} Moreover, there is a growing body of evidence that prescription opioid abuse may act as a gateway to heroin abuse.ⁱⁱ Some studies estimate as many as three out of four people with prescription opioid addiction eventually use heroin as a less expensive source of opioids.ⁱⁱⁱ Recent studies suggest that 2.1 million people in the U.S. abuse prescription opioids while nearly half a million people are addicted to heroin.^{iv}

National research indicates the highest rates of growth in inpatient hospitalizations have been among females and the elderly. Geographically, the largest increases have occurred in the Midwest which experienced an average growth in hospitalizations for opioid overuse of 9.1 percent per year — 4.3 times the rate of growth

in the Northeast, 1.7 times the rate of growth in the South and 1.3 times the rate of growth in the West.^v In addition, deaths resulting from prescription opioid overdoses have quadrupled in the U.S. since 1999.^{iv} This increase in abuse and overdose of prescription opioids has garnered so much attention that the U.S. Centers for Disease Control and Prevention recently described the situation as reaching epidemic status in the U.S.^{vi} Using 10 years of hospital inpatient and emergency department data, this analysis focuses on trends in hospital utilization by Missouri residents for prescription opioid overuse. Because analgesic opioid addiction can be prevented and misuse often originates with a prescription by a physician, the data analyzed excluded hospital encounters for illicit opioids such as heroin.^{vii}

The rate of inpatient hospitalizations and hospital ED visits for analgesic opioid overuse in Missouri more than doubled between 2005 and 2014.^{viii} The rate of hospital encounters with opioid overuse as a primary or contributing factor was 187 per 100,000 in 2005 and 424 per 100,000 in 2014 — an overall increase of 137 percent during the 10-year study period (Figure 1). The majority of this growth occurred between 2006 and 2012 when the state experienced an average increase of 12 percent annually. The rate of hospital inpatient and ED visits for opioid overuse in Missouri leveled off between 2012 and 2014; however, it remains high.

Table 1 includes the number and proportion of hospital encounters for analgesic opioid overuse, as well as stratified rates of growth for various demographic groups and regions of the state. The majority of hospital encounters resulted in the patient being hospitalized, with 62 percent of visits having occurred in an inpatient setting in 2014. However, 63.3 percent of the 15,951 inpatient encounters during 2014 were admitted through the ED which indicates 77.4 percent of visits statewide received treatment in an ED last year (data not displayed). ED visits for opioid overuse that were treated and released increased at a faster pace than inpatient hospitalizations between 2005 and 2014 (a 10-year cumulative increase of 179.5 percent). The population segment experiencing the highest rate of growth was the under age 30 cohort. Evaluating the data by gender and race revealed that male and white patients experienced higher rates of growth than female and non-white patients in Missouri between 2005 and 2014, an observation supported by recent national data suggesting white males, particularly in rural areas, have the highest opioid-related mortality rates.^{ix}

Geographically, the highest rates per 100,000 population remained in the metro areas; however, the highest rate increases occurred in predominantly rural areas of the state — the Northeast and Southeast regions in particular (Panel 1).

All 10 years of hospital encounters for opioid overuse were aggregated at the ZIP-code level and calculated as a rate of the 2014 population while controlling for geographic clustering to detect opioid overuse hot spots. Figure 2 highlights results of the hot spot analysis.

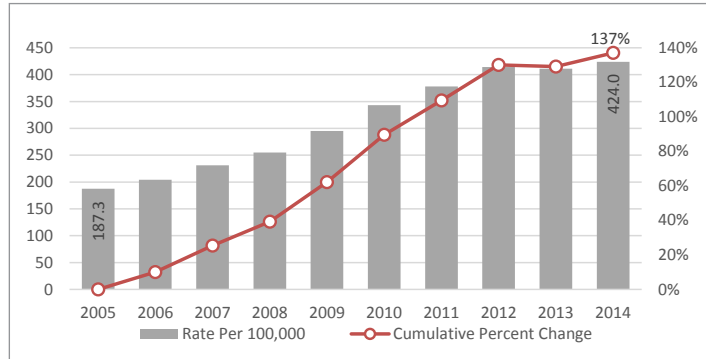
At the ZIP-code level in Missouri, the hottest spots of opioid overuse

throughout the last 10 years have been predominantly parts of the St. Louis and Kansas City metropolitan areas, and rural areas in and around St. Francois County. Other statistically significant hot spots were observed around the area stretching from Bolivar in Polk County south to Springfield in Greene County, the Troy area in Lincoln County, the Doniphan area in Ripley County,

the southwest corners of Taney and Dunklin Counties and near Sullivan in Crawford, Franklin and Washington Counties (Figure 2).

Panel 2 includes the cumulative percent change between 2005 and 2014 in hospital utilization for analgesic opioid overuse by additional segmentation of the patient population.

Figure 1: Rate of Hospital Inpatient and ED Visits, and Cumulative Percent Change in Missouri, 2005-2014



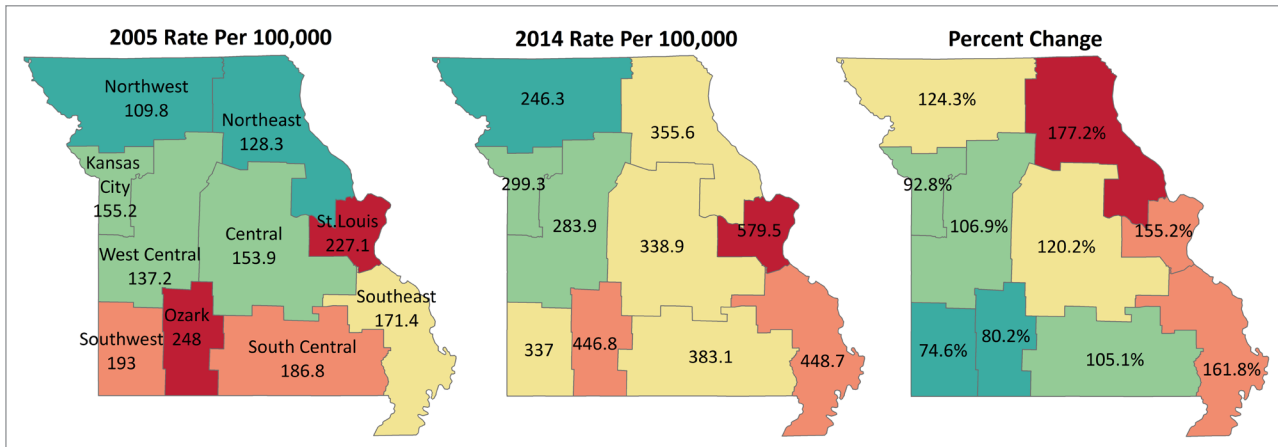
Sources: Hospital Industry Data Institute FY 2005-2014 Missouri Inpatient and Outpatient Databases and Nielsen Claritas PopFacts Premier.

Table 1: Hospital Inpatient and ED Visits for Opioid Overuse by Patient Demographics, Region and Setting, 2005 Compared to 2014

	2005		2014		10-yr Percent Change
	Visits	Percent	Visits	Percent	
Total	10,847	100%	25,711	100%	137.0%
Patient Gender					
Female	5,500	50.7%	12,698	49.4%	130.9%
Male	5,347	49.3%	13,013	50.6%	143.4%
Patient Age					
Under 30	2,830	26.1%	7,251	28.2%	156.2%
30-50	4,756	43.8%	10,947	42.6%	130.2%
Over 50	3,261	30.1%	7,513	29.2%	130.4%
Patient Race					
White	8,485	78.2%	20,289	78.9%	139.1%
Non-white	2,362	21.8%	5,422	21.1%	129.6%
Patient Region					
Central	990	9.1%	2,337	9.1%	136.1%
Kansas City	1,642	15.1%	3,399	13.2%	107.0%
Northeast	331	3.1%	954	3.7%	188.2%
Northwest	284	2.6%	641	2.5%	125.7%
Ozark	1,186	10.9%	2,402	9.3%	102.5%
South Central	385	3.5%	803	3.1%	108.6%
Southeast	618	5.7%	1,644	6.4%	166.0%
Southwest	545	5.0%	985	3.8%	80.7%
St. Louis	4,466	41.2%	11,726	45.6%	162.6%
West Central	382	3.5%	796	3.1%	108.4%
Visit Setting					
Inpatient	7,355	67.8%	15,951	62.0%	116.9%
Emergency Department	3,492	32.2%	9,760	38.0%	179.5%

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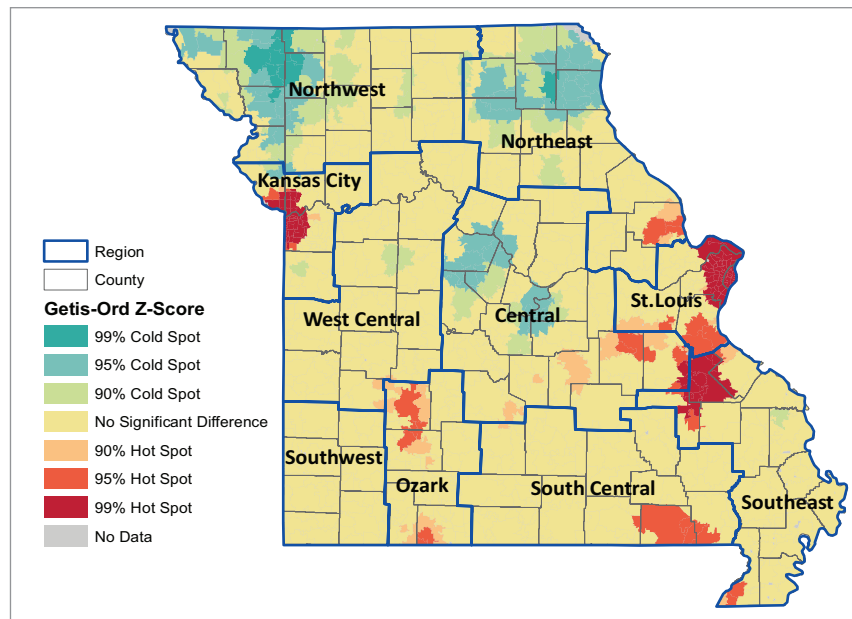
Panel 1: Rates of Hospital Inpatient and ED Visits for Opioid Overuse by Region, 2005 Compared to 2014 and Cumulative Percent Change



Sources: Hospital Industry Data Institute FY 2005 and FY 2014 Missouri Inpatient and Outpatient Hospital Discharge Databases and U.S. Census Bureau 2005 and 2014 Population Estimates Program. The regions depicted in these maps are Missouri Workforce Investment Areas.

Significant increases were observed in each age and gender category evaluated. While still more than doubling during the 10-year period, the smallest rate of growth was observed among females older than 50 who experienced a 116 percent increase. The highest increases were observed in Missouri residents younger than 30 with males experiencing 161 percent more hospital inpatient and ED encounters in 2014 than they did in 2005, while females under 30 experienced a 151 percent increase. Males older than 50 had the next highest rate of growth at 149 percent and both males and females between the ages of 30 and 50 experienced 130 percent more hospital visits for opioid overuse in 2014 (Panel 2, top).

Figure 2: 2005-2014 ZIP-Code Level Hot Spots for Opioid Overuse-Related Hospital Visits



Sources: Hospital Industry Data Institute FY 2005 and FY 2014 Missouri Inpatient and Outpatient Hospital Discharge Databases and Nielsen-Claritas 2014 PopFacts Premier. Z-scores were calculated at the ZIP-level using the rate of hospital visits between FY 2005 and FY 2014 per 10,000 residents in 2014. ZIP codes with fewer than 50 residents were omitted. The regions depicted in this map are Missouri Workforce Investment Areas.

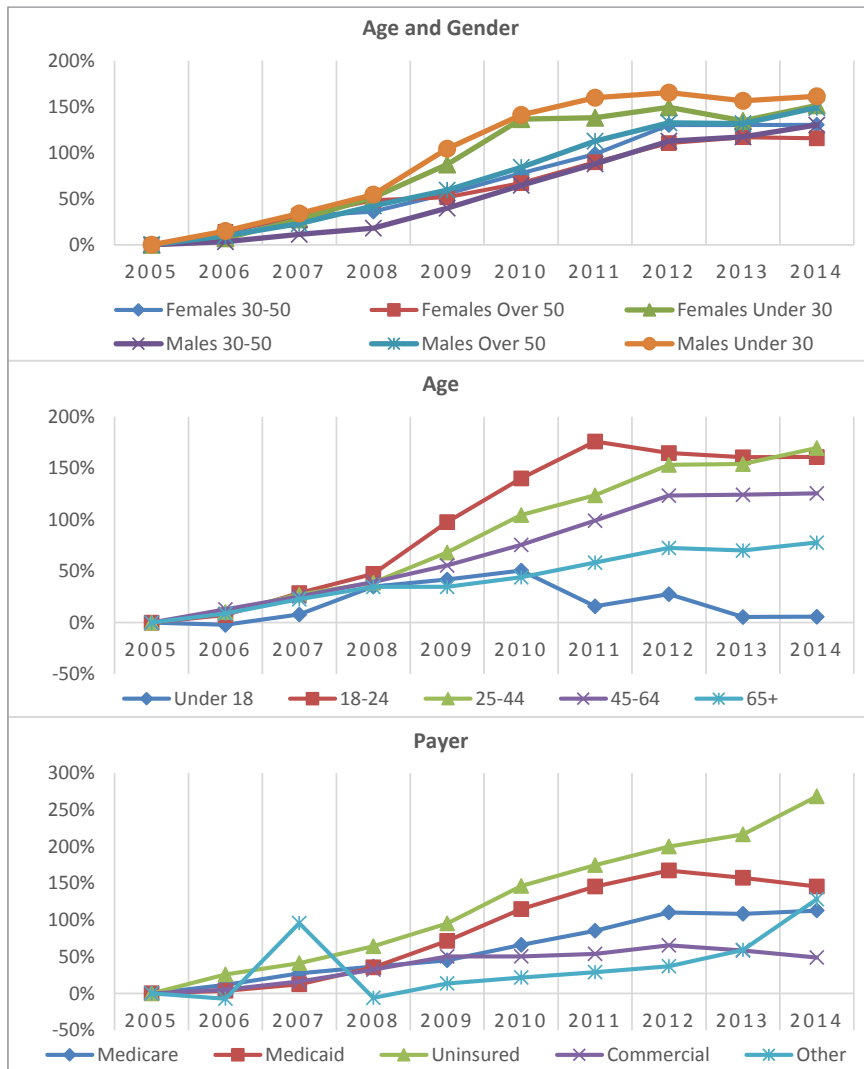
Evaluating by age alone revealed that hospital inpatient and ED visits for analgesic opioid overuse among children and adolescents increased substantially between 2008 and 2010, but have since returned to just over their 2005 levels. Patients age 25 to 44 accounted for both the largest number of visits in 2014 and the highest growth rate from 2005. At the beginning of the study period, this segment accounted for 4,478 hospitalizations and ED visits for opioid

overuse (41 percent of all visits). By 2014, the number of hospital encounters increased to 12,076 — this was 47 percent of all visits and, throughout 10 years, a 170 percent increase (Panel 2, middle).

Among primary payer categories, uninsured patients accounted for the highest volume of hospital visits for opioid overuse in 2014 and experienced the fastest growth throughout the 10-year period. In 2005, uninsured

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Panel 2: Hospital Inpatient and Emergency Department Visits for Opioid Overuse by Patient Demographics, Cumulative Percent Change From 2005



Source: Hospital Industry Data Institute FY 2005-2014 Missouri Inpatient and Outpatient Databases.

patients had the second-lowest number of visits at 2,119 (19.5 percent of all visits). In 2014, they accounted for 7,800 visits. This was 30.3 percent of all hospital inpatient and ED visits for opioid overuse, resulting in a 268 percent increase throughout 10 years. Medicaid patients had the second-highest rate of growth between 2005 and 2014 at 145 percent; however, this trend turned downward toward the end of the study period. Between 2012 and 2014, hospital utilization for opioid overuse by Medicaid patients decreased by 8 percent.

Suggested Citation

Reidhead, M. (2015, October). Alarming trends in hospital utilization for opioid overuse in Missouri. *HIDI HealthStats*. Missouri Hospital Association. Hospital Industry Data Institute. Available at <http://web.mhanet.com/hidi>

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- ^{vii} The ICD-9-CM diagnosis codes used to identify hospital encounters for opioid overuse were taken from Owens, et al.^v Specific codes included: 304.00, 304.01, 304.02, 304.03, 304.70, 304.71, 304.72, 304.73, 305.50, 305.51, 305.52, 305.53, 965.00, 965.09, E850.2 and E935.2.
- ^{viii} Sources: Hospital Industry Data Institute FY2005 – FY2014 Hospital Inpatient and Outpatient Databases, and U.S. Census Bureau 2005 – 2014 Population Estimates Program. Hospital encounters for analgesic opioid overuse represent all ages with a qualifying diagnosis code^{viii} occurring anywhere on the patient record for discharges occurring between Oct. 1, 2004, and Sept. 30, 2014. Rates reported were calculated as the total number of hospital inpatient and ED visits per 100,000 population.
- ^{ix} Jones, C., Mack, K. & Paulozzi, L. (2010). Pharmaceutical overdose deaths, United States, 2010. *Journal of the American Medical Association*, 309(7), 657-659. doi:10.1001/jama.2013.272.



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