

Trends in North Carolina Hospital Use Related to Prescription Opioid and Heroin Poisoning, 2012-2015

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Introduction

In a companion findings brief, we described how using hospital claims data corresponding to both emergency department and inpatient visits can lend a broader lens to the opioid epidemic in North Carolina. The brief focused on fiscal year 2015. This finding brief expands on the same source of data and reviews trends in hospital use related to opioid poisonings from FY 2012 to FY 2015.

Definitions

This brief combines three types of hospital admissions for analysis: direct inpatient hospital admissions, emergency department visits that resulted in an inpatient stay, and emergency department visits that were treated and released from the ED without an inpatient stay. Only visits by North Carolina residents are included in the sample. Opioid related hospital visits are defined as:

- All visits with any opioid related diagnosis were defined using AHRQ HCUP definitions for opioid related hospital visits and include all poisonings but can also include admissions for opioid abuse treatment or a reason unrelated to opioid use by a patient with a known opioid dependence or abuse history¹
- Opioid poisonings, the clinical term for opioid overdoses, are a subset of all visits with any opioid related diagnosis and the focus of this brief series. Opioid poisonings according to the CDC's recommendations for classifying poisonings are further categorized as²:
 - Prescription opioid poisonings (although not necessarily by opioids prescribed to the patient);
 - Heroin poisoning;
 - Both prescription opioid and heroin poisonings (a small subset of patients are diagnosed with both types. Therefore, the sum of prescription opioid poisonings and heroin poisonings may be slightly larger than the total number of opioid poisonings across categories.)

Key Findings

- **There was an overall increase of 37% in hospital utilization related to opioid poisonings from FY 2012 to FY 2015. The bulk of this increase was due to increases in heroin-related visits (283% increase) rather than in prescription poisoning (8%).**
- **The 8% increase in prescription poisoning visits can be attributed to those aged 55 and older. Medicare patients make up the largest proportion of prescription drug poisoning visits while the uninsured make up the smallest proportion.**
- **Individuals aged 19-34 accounted for majority of heroin poisonings from 2012 to 2015 (70% in FY 2015). However, significant increases in hospital use for heroin poisonings are seen in nearly all age groups excluding young children and the elderly 65 and older**
- **Males are presenting to hospitals with heroin poisoning at consistently higher rates than females. The rate of increase for males is also consistently higher. These patterns have led to men surpassing women for all opioid overdose related visits in FY 2015.**
- **The uninsured account for the majority of heroin poisoning related hospital use (53% in FY 2015), although the rate is rapidly increasing for the four major payor groups: the uninsured, Medicare, Medicaid and the commercially insured.**



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Table 1. Number of Cases of Opioid Dependence, Abuse and Overdoses in Hospitals by Type.
Overall Poisoning Trends by Age, Sex and Payer

	Fiscal Year 2012		Fiscal Year 2015		% Change FY 2012 to FY 2015	
	Prescription Poisoning no. (%)	Heroin Poisoning no. (%)	Prescription Poisoning no. (%)	Heroin Poisoning no. (%)	Prescription Poisoning	Heroin Poisoning
All visits with any opioid related diagnosis	28,226		41,578		47%	
All opioid poisoning	4,159		5,715		37%	
Prescription poisoning	3,710		3,995		8%	
Heroin poisoning	464		1,777		283%	
Age Category						
0-11	92 (2.5)	* (*)	89 (2.2)	* (*)	-3%	*
12-18	159 (4.3)	18 (3.9)	161 (4.0)	35 (2.0)	1%	94%
19-24	380 (10.2)	148 (31.9)	366 (9.2)	492 (27.7)	-4%	232%
25-34	584 (15.7)	170 (36.6)	578 (14.5)	753 (42.4)	-1%	343%
35-44	606 (16.3)	61 (13.1)	623 (15.6)	277 (15.6)	3%	354%
45-54	754 (20.3)	50 (10.8)	779 (19.5)	140 (7.9)	3%	180%
55-64	654 (17.6)	16 (3.4)	793 (19.8)	73 (4.1)	21%	356%
65 or more	481 (13.0)	* (*)	606 (15.2)	* (*)	26%	*
Sex						
Male	1609 (43.3)	311 (67.0)	1779 (44.5)	1172 (66.0)	11%	277%
Female	2100 (56.6)	153 (33.0)	2216 (55.5)	605 (34.0)	6%	295%
Payer						
Commercial/HMO	849 (22.9)	87 (18.8)	1060 (26.5)	378 (21.3)	25%	334%
Medicaid	835 (22.5)	76 (16.4)	844 (21.1)	320 (18.0)	1%	321%
Medicare	1113 (30.0)	18 (3.9)	1168 (29.2)	69 (3.9)	5%	283%
Uninsured	779 (21.0)	269 (58.0)	760 (19.0)	971 (54.6)	-2%	261%
Other, Govt, or Unknown	134 (3.6)	14 (3.0)	163 (4.1)	39 (2.20)	19%	179%

*Values of 10 or fewer are suppressed for privacy

Findings

Table 1 gives an overview of changes between fiscal years 2012 and 2015 of all visits with any opioid related diagnosis and all opioid poisoning visits separated by prescription versus heroin for different demographics. Opioid poisoning visits increased by 37% during this time. Prescription opioid poisonings saw an 8% increase while heroin poisoning visits increased by 283%.

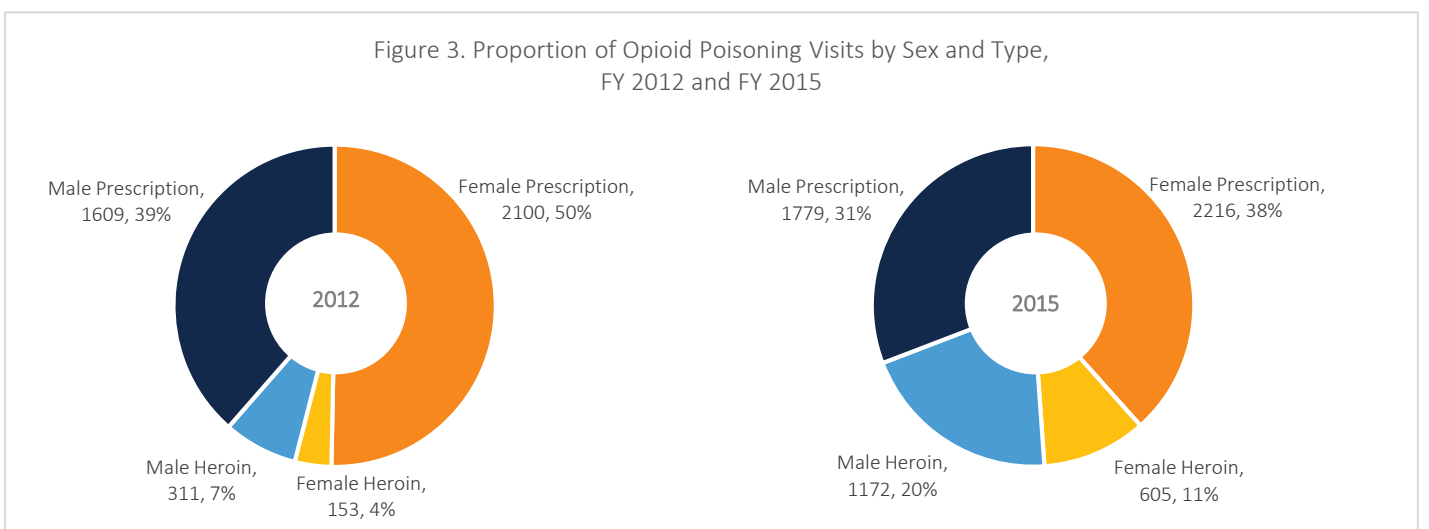
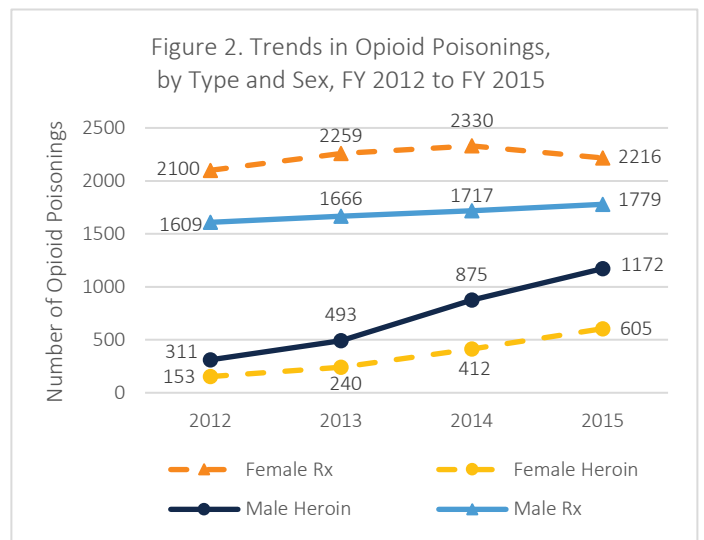
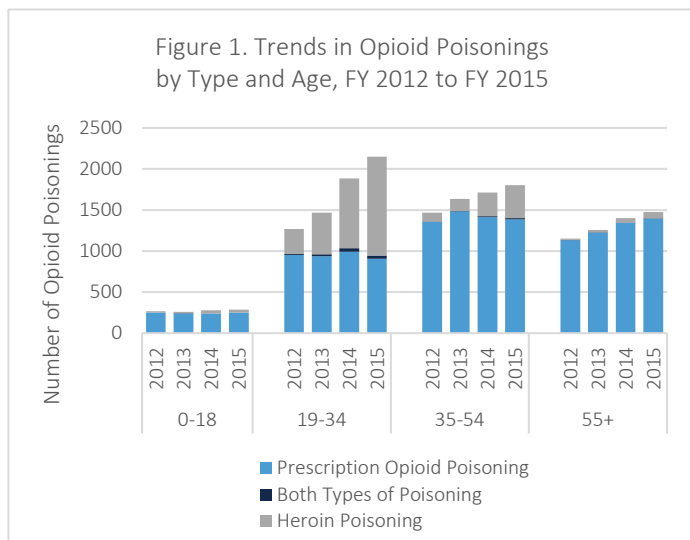
Figure 1 shows trends in opioid poisoning visits split by type of opioid and age category. Individuals aged 19 to 34 had 1,245 heroin poisoning visits in FY 2015, up from 318 visits in FY 2012. This age group consistently accounts for the large majority of heroin poisoning visits (70% in FY 2015). However, as can be seen in Table 1 nearly every age category, excluding young children under 12 and the elderly aged 65 and older, has seen large increases in heroin poisoning hospital visits.

The increase in prescription opioid overdoses is concentrated among older adults and the elderly. For all age groups under 55, there was either a net decrease or a 3% or less increase in prescription opioid poisoning visits from FY 2012 to FY 2015. Individuals aged 55-64 and 65 and older had a 21% and 26% increase in prescription opioid poisoning visits, respectively.

Figure 2 displays trends in opioid poisonings by type and sex. While the total number of prescription opioid poisonings in women consistently exceeds the number in men, the gap appears to be narrowing as prescription opioid poisoning visits have seen a small but steady increase in men (11% net increase from FY 2012 to FY 2015) but decreased for women from FY 2014 to FY 2015 (6% net increase from FY 2012 to FY 2015).

Heroin poisoning visits have nearly quadrupled from FY 2012 to FY 2015 in both males and females (277% increase and 295% increase, respectively), but the number of heroin poisoning visits in males has remained about double the number in females across these years. This large gap between male and female heroin poisoning visits, along with the increase in males in prescription opioid poisoning visits, has led to males surpassing women in FY 2015 in the total number of opioid poisoning hospital visits.

Figure 3 displays how the percentage of opioid poisonings for males and females and for heroin and prescription opioids has shifted from FY 2012 to FY 2015. While the total number of poisonings has increased in all four categories, heroin poisonings now account for a much greater share of all opioid poisonings. In FY 2012, 11.3% of all opioid poisoning visits included a heroin poisoning diagnosis. The proportion rose to 31.2% in FY 2015.



Finally, we examined opioid poisonings by payer group. **Figure 4** shows the number of hospital visits related to heroin poisonings from FY 2012 to FY 2015 separated by payer group. Over the studied period, the majority of heroin poisoning visits to hospitals were by patients who were uninsured. As outlined in Table 1, in FY 2012, 58% of all heroin poisoning visits (269 out of 464) were by uninsured patients. The number of heroin poisoning visits have risen significantly from FY 2012 to FY 2015 for the uninsured, the commercially insured and Medicaid recipients. However, the proportions of heroin poisoning visits pertaining to each group have remained stable, with uninsured patients contributing 55% (971 out of 1,777) of heroin poisoning visits in FY 2015 followed by commercially insured at 22% and Medicaid patients at 18%.

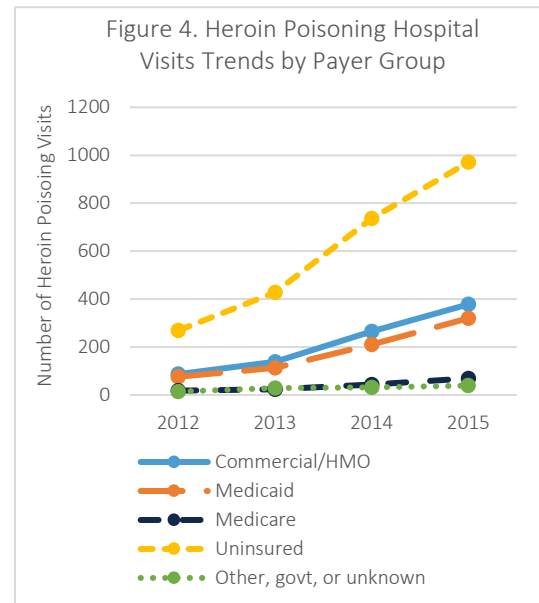
Medicare remains the largest payer group for prescription opioid poisonings (29.2% in FY 2015) but the commercially insured have seen a steady increase in prescription opioid poisonings and are following closely behind (26.5% in FY 2015). When examined by both sex and age category, elderly men 65 and older had the largest percent increase in prescription opioid overdoses from FY 2012 to FY 2015 (45% increase) followed by men aged 55 to 64 years old (30% increase).

Methods and Limitations

North Carolina hospital discharge data collected by IBM Watson Health under state statute were analyzed by fiscal year from October 2012 to October 2015.³ ICD-9 codes of interest were identified consistent with the AHRQ Health Care Cost and Utilization Project (HCUP) standards for classifying opioid related hospital use and each visit with at least one of the HCUP codes was included in the sample.¹ For privacy purposes, patients were not linked across multiple encounters; therefore, observations are at the visit-level rather than the patient level. We only included short term general acute non-federal hospitals in our analysis. These data also do not include 911 calls that did not result in transportation or resulted in death before arrival to the ED.

References

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3. NC General Assembly. Medical Care Data Act. 1995. http://www.ncga.state.nc.us/EnactedLegislation/Statutes/PDF/ByArticle/Chapter_131E/Article_11A.pdf.



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