

Opioid Poisoning Related Hospital Use in North Carolina

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Introduction

Nationally, the opioid epidemic is expanding at a rapid pace. Deaths from opioid overdose quadrupled from 1999 to 2016.¹ The opioid epidemic has caused increases in general drug overdose mortality rates, and North Carolina is experiencing a faster increase in drug overdose deaths than the nation as a whole. In 2015, 1,567 North Carolinians died from drug overdose, a 14.5% increase in deaths from 2014 compared to the national average increase of 6.5%.² Opioid use does not always manifest in death. One report estimates that there are four inpatient visits and ten emergency department visits for every death by opioid poisoning.³ In addition to the existing prescription opioid epidemic, the US is now facing a surge in heroin use and overdoses. Heroin is a cheaper, more effective way to experience the effects of opioids, especially for individuals with an increased tolerance to opioids.⁴ Due to these factors and heroin's increased street accessibility, heroin use is increasing among people diverting from abuse of prescription opioids and also by individuals who had not previously abused prescription opioids. To better understand the opioid epidemic in North Carolina, this brief analyzes North Carolina hospital visit data and aims to provide a broader view of the state's opioid epidemic and usage patterns than what can be seen in mortality data.

While the Centers for Disease Control and Prevention (CDC) reports that 1,567 deaths occurred due to all drug overdoses in North Carolina in 2015, by analyzing hospital visits with any opioid poisoning related diagnosis code, we found 5,715 "opioid poisoning" visits to NC hospitals in FY 2015. (For this brief, we focus on these opioid poisonings, the medical diagnostic term for an opioid overdose.) Opioid poisonings are further grouped into prescription (regardless of whether the individual had a prescription for the medication) and heroin poisonings, following the CDC's guidelines for ICD-9 poisoning codes.⁵ Patients may sometimes present with both types of opioids in their system, therefore, the sum of prescription opioid and heroin poisonings is slightly larger than the total number of opioid poisonings. Hospital visits are defined as all visits to the emergency department as well as direct inpatient admissions. The analysis excludes visits by patients who are not North Carolina residents. For more information on how these cases were classified, refer to the methods section.

Key Findings

- **Males accounted for 2 out of every 3 heroin poisoning diagnoses. Females account for the greater proportion of prescription poisonings.**
- **Individuals aged 19-34 have the highest rates of opioid poisoning due to a higher rate for heroin. Prescription poisoning is highest in older age groups.**
- **The majority of visits for heroin poisoning visits (55%) were for the uninsured. Medicare is the largest payer for prescription poisoning visits.**



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Findings

Figure 1 displays prescription opioid and heroin poisonings in FY 2015 split by sex. The total number of opioid poisoning related visits for males versus females was nearly equal (51% versus 49% respectively), but males were much more likely to present with heroin poisoning than females. Forty percent of opioid poisoning cases in males involved heroin, compared to 22% of cases for females. Females are more likely than men to present with a prescription opioid poisoning and accounted for 55.5% of all prescription opioid poisonings in FY 2015.

Figure 2 breaks down opioid poisonings by age. Individuals aged 25-34 account for the highest proportion of opioid poisoning visits followed by those aged 19-24, though when accounting for population, the rate of heroin poisonings among the two age categories is nearly equal at 40.9 per 100,000 for ages 19-34 and 42.7 per 100,000 for ages 25-34.

Overall, young adults aged 19-34 contributed 38% of all opioid poisoning visits, but accounted for 70% of heroin poisoning visits and only 24% of prescription opioid poisoning visits. Adults over 55 are much less likely to present with heroin poisoning and accounted for only 4% of all heroin poisoning visits in FY 2015. Adults over the age of 35 made up 57% of all opioid visits but 70% of prescription opioid poisoning visits.

Figure 3 breaks up prescription opioid and heroin poisoning by payer group. More than half (55%) of all heroin poisoning visits to hospitals in FY 2015 were by uninsured patients. There is a tremendous gap between the number of heroin poisoning corresponding to uninsured patients versus all other payer groups; commercial insurers were the second largest payer group, behind by 34 percentage points. Although the Medicare population has the second lowest rate and the second lowest count of opioid poisoning behind children 0-18, in all three categories of poisoning (all opioid, heroin, and prescription), Medicare is the largest payer for prescription opioid poisoning, followed closely by all commercial insurers combined.

Figure 1. FY 2015 Opioid Poisoning Visits by Type and Sex

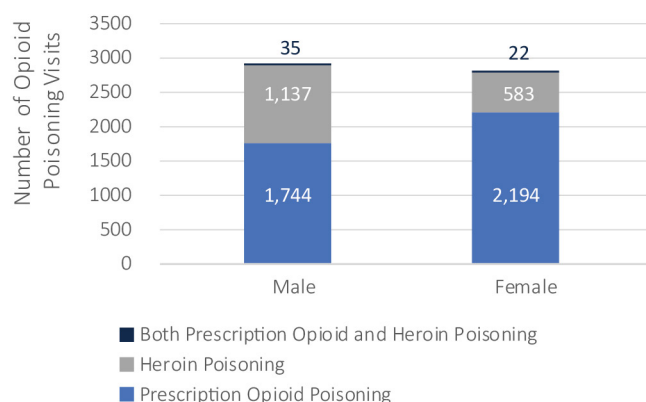


Figure 2. FY 2015 Rates of Opioid Poisoning by Type and Age*

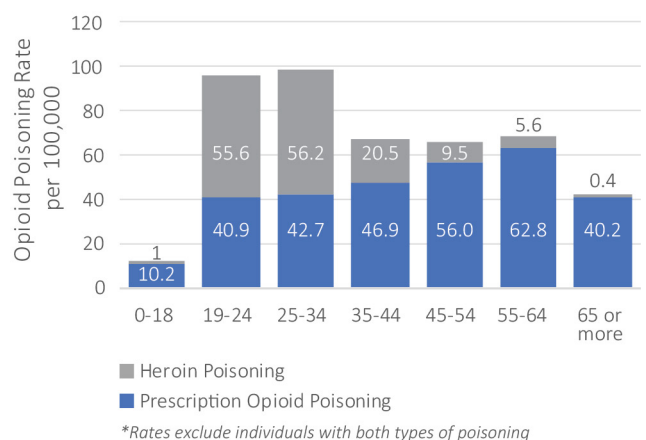
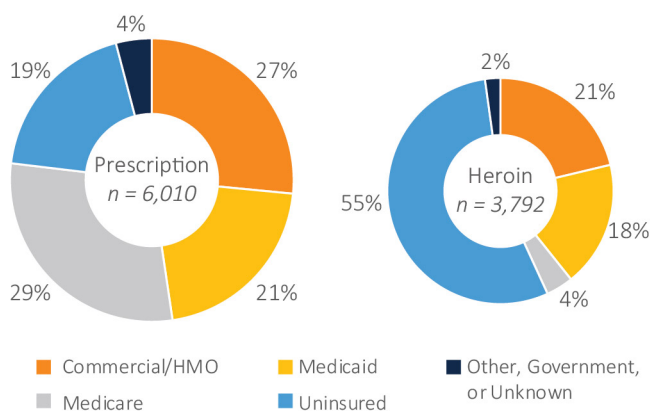


Figure 3. FY 2015 Opioid Poisoning Visits by Payer Group



Methods and Limitations

North Carolina hospital discharge data collected by IBM Watson Health under state statute were analyzed by fiscal year from October 1, 2011 to September 31, 2015.⁶ 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.⁷ For privacy purposes, patients were not linked for multiple encounters in this dataset; 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 transport to a hospital or ED or inpatient visits or resulted in death before arrival to the ED. Counts with fewer than ten visits are suppressed.

References

1. Rudd RA, Aleshire N, Zibbell JE, Gladden RM. Increases in Drug and Opioid Overdose Deaths--United States, 2000-2014. *MMWR Morb Mortal Wkly Rep*. 2016;64(50-51):1378-1382. doi:10.15585/mmwr.mm6450a3.
2. CDC. Drug Overdose Death Data. <https://www.cdc.gov/drugoverdose/data/statedeaths.html>. Published 2016.
3. Ohio Department of Health. Ohio's Prescription Drug Overdose Epidemic: Epidemiology, Contributing Factors and Ongoing Prevention Efforts. 2014. <https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/health/injury-prevention/2012-overdose-data/1Drug-poisoning-Oct-2014.pdf?la=en>.
4. Compton WM, Jones CM, Baldwin GT. Relationship between Nonmedical Prescription-Opioid Use and Heroin Use. *N Engl J Med*. 2016;374(2):154-163. doi:10.1056/NEJMra1508490.
5. CDC Prescription Drug Overdose Team. Guide to ICD-9-CM and ICD-10 Codes Related to Poisoning and Pain. In: State Health Department Training and Technical Assistance Meeting. Atlanta, GA: Centers for Disease Control and Prevention; 2013. https://www.cdc.gov/drugoverdose/pdf/pdo_guide_to_icd-9-cm_and_icd-10_codes-a.pdf.
6. NC General Assembly. Medical Care Data Act. 1995. http://www.ncga.state.nc.us/EnactedLegislation/Statutes/PDF/ByArticle/Chapter_131E/Article_11A.pdf.
7. 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. 2016. <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb219-Opioid-Hospital-Stays-ED-Visits-by-State.pdf>.

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