

# EMS Heroin Overdoses with Refusal to Transport & Impacts on ED Overdose Surveillance

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## Objective

The aim of this project was to explore changing patterns in patient refusal to transport by emergency medical services for classified heroin overdoses and possible implications on heroin overdose surveillance in Kentucky.

## Introduction

As a Centers for Disease Control and Prevention Enhanced State Opioid Overdose Surveillance (ESOOS) funded state, Kentucky started utilizing Emergency Medical Services (EMS) data to increase timeliness of state data on drug overdose events in late 2016. Using developed definitions of heroin overdose for EMS emergency runs, Kentucky analyzed the patterns of refused/transported EMS runs for both statewide and local jurisdictions. Changes in EMS transportation patterns of heroin overdoses can have a dramatic impact on other surveillance systems, such as emergency department (ED) claims data or syndromic surveillance (SyS) data.

## Methods

As part of the ESOOS grant, Kentucky receives all emergency-only EMS runs monthly from Kentucky Board for Emergency Medical Services, Kentucky State Ambulance Reporting System data. Heroin cases were classified based on text and medications (Narcan) administered, with comparisons to historic data discussed elsewhere (Rock & Singleton, 2018). Transportation classifications are based on EMS standard elements defining treatment with transportation vs refusal to transport to hospital and canceled runs were excluded. Initial analysis included trend analysis at state and local levels, as well as demographic comparisons of refusal vs transported heroin overdose encounters.

## Results

Statewide trends in EMS heroin overdoses with refusal transport significantly increased from 5% (n=42) in 2016 quarter three to 22% (n=290) in 2018 quarter two (Fig 1). Initial demographic analysis does not show any significant difference between refusals/transported for age, gender, or race. However, there are significant differences among geographic regions in Kentucky with heroin encounter refusal proportion ranging from 3%-48% in 2018 quarter two. Specifically, one urban area (Fig 2) shows the change in proportion of refusal increasing from 15% (n=23) in 2016 quarter three to 47% (n=110) in 2018 quarter two. In this geographic area, combined refused/transported EMS heroin overdoses compared to traditional ED data demonstrates opposing heroin overdose patterns for the same local with EMS showing and increasing trend overtime and ED showing a decreasing trend (Fig 3).

## Conclusions

Traditional public health surveillance for heroin overdose has historically relied on ED billing data, though agencies are starting to use syndromic surveillance, too (Vivolo-Kantor et al., 2016). These systems share similar underlying ED data, albeit with different components, quality, and limitations. However, in terms of the overdose epidemic, both are limited to only heroin overdoses that result in ED hospital encounters. The recent drastic increase in refused transport can have significant impacts on heroin surveillance. Jurisdictions relying on SyS or ED data for monitoring overdose patterns and/or evaluating interventions may be significantly underestimating acute overdose occurrence in the population. This analysis highlights the importance of this preclinical data source in surveillance of the heroin epidemic.

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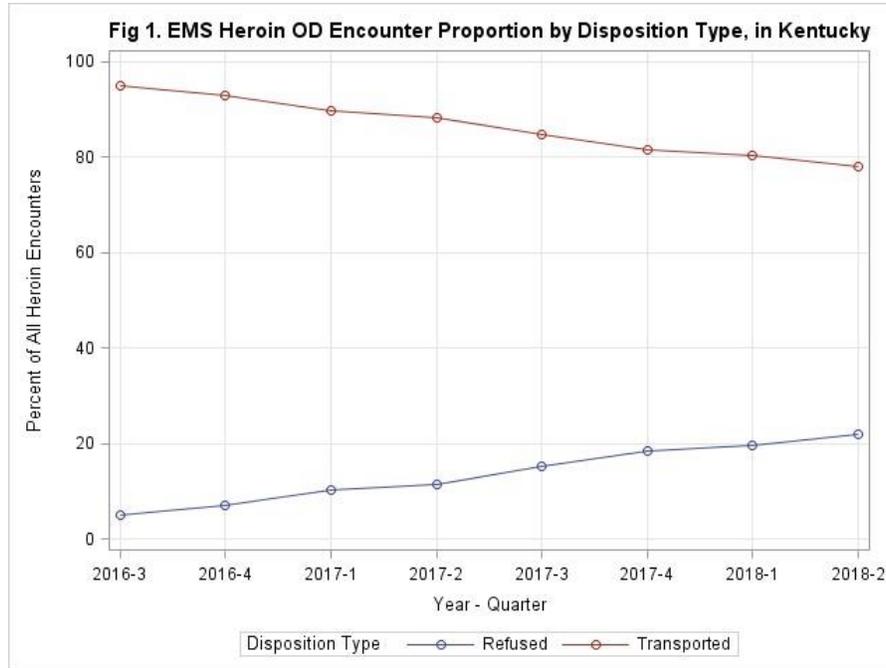
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Vivolo-Kantor AM, Seth P, Gladden RM, Mattson CL, Baldwin GT, et al. (2016). Morbidity and Mortality Weekly Report Vital Signs: Trends in Emergency Department Visits for Suspected Opioid Overdoses — United States, 67(9), 279–285. Retrieved from <https://www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6709e1-H.pdf>

Figure 1



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Figure 2

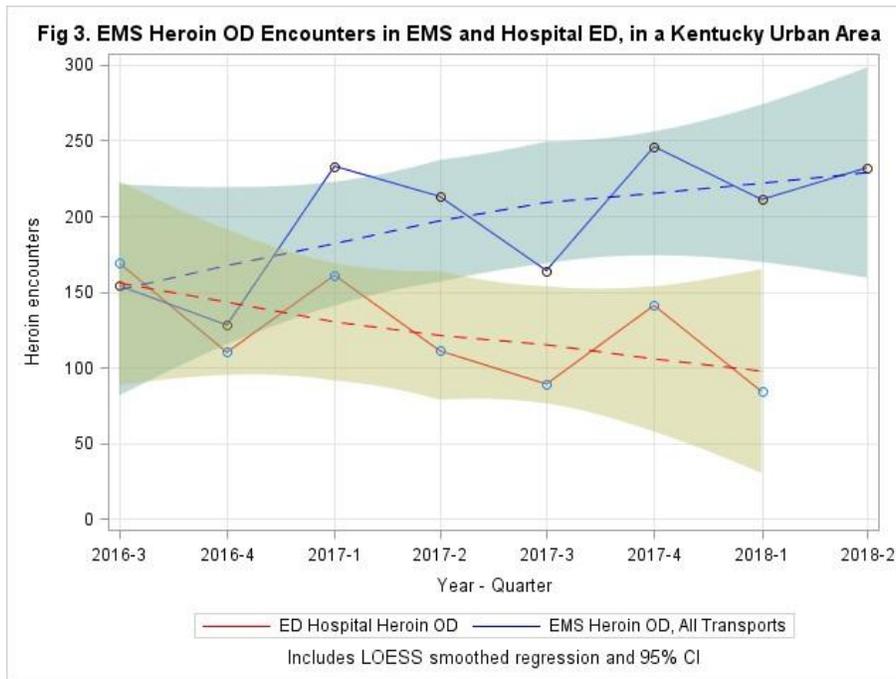
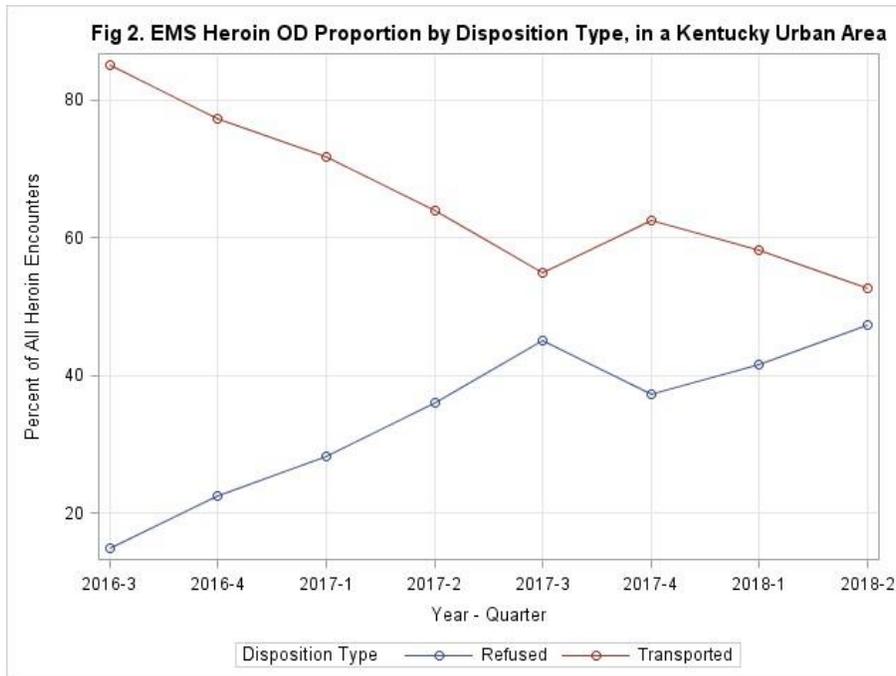


Figure 3



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