

# A proposed SyS Case Definition for Opioid Overdose Related ED visits- an evaluation in three regions

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## Objective

The objective is to develop a standard opioid overdose case definition that could be generalized nationally.

## Introduction

Opioid ODs have been rising globally and nationally. The death rate from ODs in the United States has increased 137% since 2000, including a 200% increase of OD deaths involving opioids<sup>1</sup>. The pilot project, a collaboration across 3 states, allowed information sharing with Syndromic surveillance (SyS) partners across jurisdictions, such as sharing a standard SyS case definition and verifying its applicability in each jurisdiction. This is a continuation of the work from an initial pilot project presented during the ISDS Opioid OD Webinar series.

## Methods

Three regions (Colorado North Central Region [CO-NCR]), State of Nebraska [NE], and Marion County, Indiana) participated in the development and evaluation of the opioid OD case definition. Data sources included ESSENCE and 2015 hospital discharge data (HDD) for the first two jurisdictions. Work was conducted in 3 stages. Stage I and II consisted of the development and validation of an opioid misuse definition. In stage I, the percent of completeness of admission date, chief complaint (CC), and discharge diagnosis (DD) was assessed from January 2015 to August 2016 SyS emergency department (ED) data from each of the 3 participating jurisdictions. Data selected for the time period with the best completeness among all jurisdictions was utilized to develop a case definition. Completeness of ESSENCE data submission was assessed at all jurisdictions. The threshold for best data quality was 80% of completeness. SyS ED data was analyzed for the selection of CC search terms and ICD9/ICD10<sup>2</sup> DD codes, and the reported Chief Complaint-Discharge Diagnosis (CCDD) were validated by analyzing consistency between CC and DD. In stage II, the consistency of DD reporting corresponding to the opioid case definition was assessed for CO-NCR and NE data by performing Pearson Correlation analysis to compare the weekly counts of opioid misuse cases in 2015 SyS ED data to those obtained in HDD. Stage III consisted of the development of an opioid OD case definition that meets the DD code reporting requirements of the Centers for Disease Control and Prevention (CDC), Prescription Drug Overdose Prevention for States awardees. This definition consisted of an ESSENCE query containing CC, and CCDD components. For Stage III, SyS ED data was analyzed for the August 2016 to August 2017 time period. The case definition was evaluated by assessing the consistency between the CC and DD reported for each identified opioid OD possible case. Triage notes were used for case validation.

## Results

Stage I: Mean percent of completeness of DD codes for CO-NCR, NE and Marion County, IN, 2015 ED SyS data was  $\geq 85\%$ . In the CO-NCR, of 963 cases detected by the CC definition, 99.4% had an opioid misuse diagnostic code in the DD, while of 1,445 cases detected by the DD, 66.2 % had an associated opioid misuse in the

CC search terms. In NE, of 6 cases detected by the CC definition, 33% identified opioid misuse DD. However, of 42 cases detected by the DD definition, only 5% identified opioid misuse CC search terms. In Marion County, IN, of 95 cases detected by the CC definition, 70% identified opioid related diagnosis codes. Of 191 cases detected by the DD definition, only 20% identified opioid-related CC search terms. Stage II: Results of the Pearson correlation analysis indicate statistically significant correlations between 2015 SyS and HDD data for the DD code based opioid definition for both CO ( $r = 0.92$ ,  $p < 0.0001$ ), and NE ( $r = 0.63$ ,  $p < 0.0001$ ). Stage III: In NE, 56% of the cases detected by the CC component, identified opioid OD DD codes, and only 8% of the cases detected by the DD component identified opioid OD search terms in the CC. Triage notes were consistent with opioid OD in 55% of the cases detected by the DD component. However, for CO-NCR, of 235 cases detected by the CC component, 215 identified opioid OD DD codes. Of 465 cases detected by the DD component, 46% identified opioid OD search terms in the CC field. Triage notes values were consistent with opioid OD reported DD codes in 80% of the cases.

## Conclusions

Results suggest that DD codes reported in SyS ED data correlated with HDD. Indicators of opioid OD signs and symptoms were observed in CCDD. Therefore, the SyS case definition proposed through this pilot project may be applied by other states to support real-time monitoring of opioid OD related hospital ED visits, and consequences of opioid OD. Further study includes exploring how triage notes search terms may improve the identification of opioid OD related ED visits.

## Keywords

opioid overdose; emergency department; drug/substance misuse; syndromic surveillance; ESSENCE

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