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Going Beyond Chief Complaints to Identify Opioid-Related Emergency Department Visits

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Objective

To identify heroin- and opioid-related emergency department visits using pre-diagnositc data. To demonstrate the value of clinical notes to public health surveillance and situational awareness.

Introduction

Overdoses of heroin and prescription opioids are a growing cause of mortality in the United States. Deaths from opioids have contributed to a rise in the overall mortality rate of middle-aged white males during an era when other demographics are experiencing life expectancy gains.1 A successful public health intervention to reverse this mortality trend requires a detailed understanding of which populations are most affected and where those populations live. While mortality is the most relevant metric for this emerging challenge, increased burden on laboratory facilities can create significant delays in obtaining confirmation of which patients died from opioid overdoses.

Emergency department visits for opioid overdoses can provide a more timely proxy measure of overall opioid use. Unfortunately, chief complaints do not always contain an indication of opioid involvement. Overdose patients are not always conscious at registration which limits the amount of information they can provide. Menu-driven registration systems can lump all overdoses together regardless of substance. A more complete record of the emergency department interaction, such as that provided by triage notes, could provide the information necessary to differentiate opioid-related visits from other overdoses.

Methods

Emergency department registration data was collected from hospitals via the EpiCenter syndromic surveillance system. This data included chief complaints, triage notes, discharge disposition, and preliminary diagnosis codes. Data elements were linked across a given visit using patient identifiers and visit numbers as appropriate.

Heroin- and opioid-related indicators were identified in chief complaints and triage notes using regular expressions. These were separated into three categories: visits with an indication of overdose, visits for withdrawal symptoms, and visits where opioids were mentioned in some other context such as history of use. These categories were designed to be mutually exclusive.

Regular expression classification results were compared to classifications based on opioid-related diagnosis codes.

Results

A total of 2,934,610 ED registrations with triage notes and diagnosis codes were collected from 82 hospitals between January 1, 2015 and August 21, 2016. Of these encounters, 24,012 referenced opioid use in some way; 16,718 mentioned heroin specifically; 3,663 mentioned fentanyl specifically; and 5,350 mentioned opioids generically.

Table 1 shows the distribution of heroin-related ED visits across categories and source of the indicator. Column totals are not the sum of individual row amounts; they have been adjusted so that a given registration is only counted once.

Table 2 shows the overlap of heroin-related ED visits between sources of indicators. Triage notes showed the least overlap with the other two sources, while chief complaints showed the most.

Conclusions

While it is possible to find indicators of opioid use or overdose in chief complaint data, that field alone does not provide total information about which ED visits are related to opioids. Triage notes in particular indicate opioid involvement in a large number of visits not identified by other data sources. While many of these are simply mentions of opioids, possibly indicating past history of use or even in some cases just that questions about opioid use were asked, a substantial number of visits with overdose indicators were also detected solely from triage note data. These results suggest that triage notes can be a valuable additional data source for more complex health concerns such as opioid drug use.

Table 1: Heroin-Related ED Visits By Indicator Source and Category

Source	Overdose	Withdrawal	Mention	Total
Chief Complaint	2,817	563	315	3,695
Triage Note	3,827	2,037	8,739	14,603
Diagnosis Code	2,327			2,327
All	6,227	2,358	8,875	16,718

Table 2: Overlap of Heroin-Related ED Visits between Indicators

	Chief Complaint	Triage Note	Diagnosis Code
Chief Complaint	100%	12.9%	63.6%
Triage Note	51.1%	100%	48.1%
Diagnosis Code	40.1%	7.7%	100%

Keywords

opioid; heroin; overdose; triage note; fentanyl

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References

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