Progress Report: Syndromic Surveillance Case Definition for Monitoring Opioid Related ED visits in the Colorado North Central Region (CO-NCR), State of Nebraska, and Marion County, Indiana

Yushiuan Chen[1], Sandra Gonzalez[2], Harold Gil[3], Michele Askenazi[1], Art Davidson[4], Cali Zimmerman[4]

Tri-County Health Department[1], State of Nebraska Department of Human Services[2], Marion County Public Health Department[3], Denver Public Health[4]

Introduction

Since 2000, the death rate from drug overdoses has increased 137%, including a 200% increase of overdose deaths involving opioids[1]. The concern of opioid overdoses has been rising nationally. Syndromic surveillance (SyS) data is collected by the National Syndromic Surveillance Program (NSSP) and the data provides rapid Chief Complaint information of Emergency Department (ED) visits. The collaboration across 3 states allowed for information sharing with SyS partners across jurisdictions, such as sharing and utilizing a standard SyS query and case definition. The goal of this ongoing collaboration is to work together to develop a standard case definition for opioid abuse/poisoning, which would then be applicable nationally. The pilot study evaluated the opioid abuse/poisoning case definition by determining the consistency of the reported Chief Complaint and Discharge Diagnosis (CC and DD) in SyS ED data. In addition, the consistency of DD corresponding to the opioid case definition was assessed by comparing the weekly counts of opioid abuse/poisoning cases in SyS ED data to those obtained in Hospital Discharge Data (HDD).

Methods

The completeness rates of admission date, CC, and DD were investigated in all three jurisdictions in Colorado, Nebraska and Indiana. Between January 2015 to August 2016, two months of data were utilized for creating a case definition. The beginning of March 2016 to the end of April 2016 provided the earliest time period for the best quality SyS data among all jurisdictions.

Single generic drug/street names were evaluated and names that picked up true cases were kept. Combined drugs were also validated in order to capture potential opioid poisoning cases that were using names of combined drugs to report their CC. Percocet and Lortab were included in the final query. The case definition of opioid overdoses excluded cases with the terms "remission", "withdrawal", and "denies heroin".

The case definition was evaluated by assessing the consistency between patients' CC and DD for Colorado and Nebraska. In order to also validate if the same criteria captured the same amount of opioid abuse/poisoning cases, opioid abuse/poisoning ICD9/ICD10[2,3] codes were searched in both of 2015 SyS and HDD. Pearson Correlation was performed in SAS by comparing weekly visit counts in individual MMWR weeks.

Results

- **In the CO-NCR,** of 963 possible cases detected by the CC definition, 99.4% (957/963) identified opioid abuse/poisoning diagnostic codes. Of 1,445 possible cases detected by the DD, 66.2 % (957/1,445) identified associated opioid abuse/poisoning chief complaint. Comparing the DD in SyS and HDD, the consistency of DD codes corresponding to the opioid definition was assessed between 2015 HDD and 2015 SyS. The mean percent of completeness of DD codes for CO-NCR 2015 ED SyS data was 85%. Results of the Pearson correlation analysis indicate statistically significant correlations between 2015 SyS and HDD data for the DD code based opioid definition (r = 0.92, p < 0.0001).

- **In the State of Nebraska,** of 6 possible cases detected by the CC definition, 33% (2/6) identified opioid abuse/poisoning DD. Of 42 possible cases detected by the DD definition, only 5% (2/42) identified abuse/poisoning CC search terms. The percent completeness of DD codes was assessed for 2015 SyS data from 16 Nebraska EDs. The consistency of DD codes corresponding to the opioid definition was assessed for these 16 EDs by comparing weekly counts for 2015 ED SyS data to 2015 ED HDD. The mean percent of completeness of DD codes for Nebraska's 2015 ED SyS data was 87%. Results of the Pearson correlation analysis indicate statistically significant correlations between 2015 Nebraska's SyS and HDD ED data for the DD codes based opioid definition (r = 0.63, p < 0.0001).

- **In Marian County, Indiana,** of 95 possible cases detected by the CC definition, 70% (39/56) identified opioid-related diagnosis codes. Of 191 possible cases detected by the DD definition, only 20% (39/191) identified opioid-related CC search terms. Further validation and analysis for cases of opioid abuse/poisoning may be accomplished based on the availability of HDD and medical charts, as completed in the other 2 jurisdictions.

Conclusion and Discussion

The final case definition for opioid abuse/poisoning included Narcan and Naloxone for opioid overdose cases specifically. Although Narcan and Naloxone were used as an antidote to prevent deaths due to opioid overdoses, these terms help identify patients admitted in EDs. While reviewing cases, we found many CCs or CCs included indicators of opioid abuse/poisoning signs and symptoms. Therefore, the final case definition can be applied by different states and help states monitor the burden of opioid abuse/poisoning related hospital ED visits, underlying factors and consequences of opioid abuse/poisoning.

Additionally, the results of the Pearson Correlation suggest the discharge diagnosis reporting is significantly consistent between HDD and SyS which indicated SyS is a reliable data source for monitoring opioid abuse/poisoning related ED visits.

Reference

1. Rudd, R. A., Aleshire, N., Zibbell, J. E., & Gladden, R. M. (2016). Increases in drug and Opioid overdose deaths — United States, 2000–2014. *MMWR. Morbidity and Mortality Weekly Report*, *64*(50-51), 1378–1382. doi:10.15585/mmwr.mm6450a3
2. Ising, A., Proescholdbell, S., Harmon, K. J., Sachdeva, N., Marshall, S. W., & Waller, A. E. (2016). Use of syndromic surveillance data to monitor poisonings and drug overdoses in state and local public health agencies. Injury Prevention, 22(Suppl 1), i43–i49. doi:10.1136/injuryprev-2015-041821
3. CSTE Alcohol and Other Drugs Indicator Subcommittee August 2016