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Surveillance of a Synthetic Cannabinoid Overdose Outbreak using Syndromic & EMS Data

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Objective

The aim of this project was to investigate anecdotal reports of an increase in synthetic cannabinoid (SynCan) overdoses in Lexington-Fayette County area of Kentucky, using rapid surveillance systems including emergency department (ED) syndromic surveillance (SyS) and emergency medical services (EMS) data.

Introduction

In mid-2017, the Kentucky Injury Prevention and Research Center (a bonafide agent of Kentucky Department for Public Health-KDPH) was alerted by members of KDPH to anecdotal evidence of a possible increase of SynCan (primarily "Serenity") overdoses. The situation presented an opportunity to demonstrate the capabilities of syndromic surveillance and emergency medical services (EMS) data systems to provide rapid situational awareness about SynCan overdoses.

Methods

SynCan cases were identified based on EMS emergency runs with narratives including mentions of 'serenity|K2|spice' and occurred in the Lexington-Fayette County. In ED SyS, SynCan cases were identified for Lexington-Fayette County area ED visits with a chief complaints of 'serenity|K2|spice' or diagnosis code of T40.7X[1-4]A. The ICD code was included after analysis of diagnosis codes in positive cases from a chief complaint only query revealed T40.7X[1-4]A as a primary code assigned in these cases. Trends for Lexington-Fayette County area were compared to state-wide total to determine if the trend is unique or related to system-wide pattern changes. EMS and ED SyS trend results were compared for internal validity. EMS incident addresses were geocoded to point-level to enable more granular analysis of geospatial patterns over time for identification of hotspots/clustering.

Results

ED SyS and EMS results demonstrated a clear temporal increase in SynCan overdoses beginning around March of 2017[Fig 1]. Further analysis indicated that this increase was most dramatically centered in the Lexington-Fayette County area [Fig 2]. The vast majority of those overdosing were males (SyS: 88.1%) with average age 37 compared to 11.9% and 36.0 for females, respectively. These demographics are similar to those reported by the New York City Department of Health and Mental Hygiene for a K2 outbreak in New York City in 2014[1]. Kernel density mapping demonstrated a strong clustering in a specific area of downtown Lexington. Additionally, analysis of EMS data revealed that a large portion of these overdoses were being admitted for observational care and thus not being captured in SyS data (based on the primary hospital's submission types).

From a practical standpoint, the rapid surveillance results only took 1-2 days to complete and highlight the utility of these data systems in preparing rapid data products. The results of the analysis were shared with local and state health department authorities, including the local Emergency Medical Advisory Board. The geospatial analysis provided local authorities with information to enable precise targeting of public health and public safety messaging.

Conclusions

By analyzing data from these systems, we were able to quickly identify the geographic areas and demographic groups that were most affected, and to describe trends in SynCan overdoses over time. As a result, we were able to provide highly-detailed data to local public health and public safety authorities to inform their response.

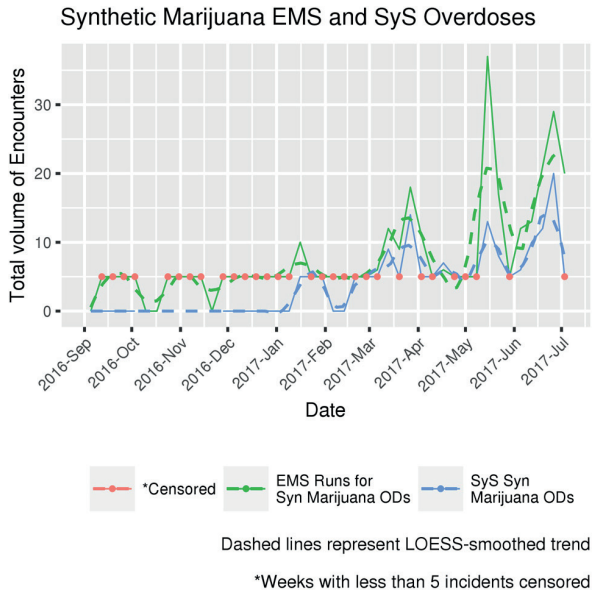

Figure 1.

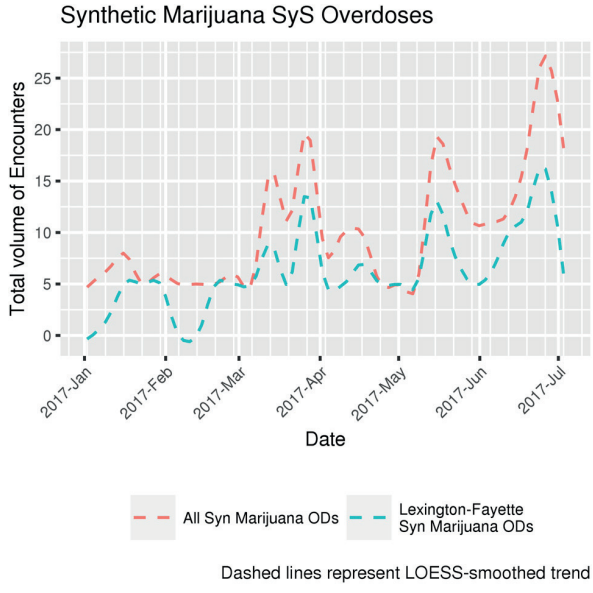

Figure 2.

Keywords
Synthetic Marijuana; EMS; Geocoding; Surveillance; Serenity

Acknowledgments

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References

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