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Development of Mental Health Classification Related to Severe Weather Events

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Objective

To describe the development and validation of a mental health classification to track emergency department visits for potential needed public health response during severe weather events.

Introduction

Real-time emergency department (ED) data are currently received from 78 of 80 New Jersey acute care and satellite EDs by Health Monitoring Systems Inc.'s (HMS) EpiCenter system. EpiCenter collects, manages and analyzes ED registration data for syndromic surveillance, and provides alerts to state and local health departments for surveillance anomalies. After the 2012 Superstorm Sandy devastated parts of New Jersey, NJDOH initiated a plan to develop severe weather surveillance using EpiCenter to provide the Department with the ability to track both health and mental health concerns during adverse weather conditions to alert the public about emerging health hazards.

Methods

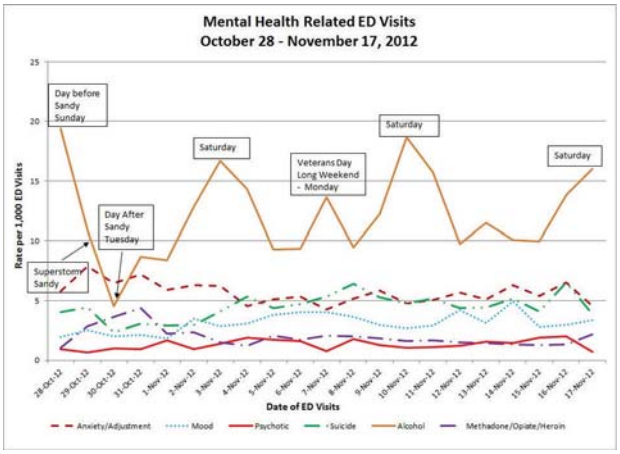
The severe weather classifier consists of the following classifications: carbon monoxide, heat related illness, hypothermia/cold related Illness, disrupted outpatient medical care, cardiovascular, tree-related injury, motor vehicle accident, gastrointestinal illness, respiratory illness, and mental health related illnesses. In collaboration with New York City Department of Health and Mental Hygiene (NYCDOHMH) and New York State Department of Health (NYSDOH), a group of specific mental health concerns including anxiety/adjustment, mood, psychotic disorders, suicide/self-inflicted injury, alcohol, and methadone/opiate/heroin use are evaluated. The evaluation process consists of two steps: 1) using cases where ICD codes are available that meet case definition to find possible inclusion keywords and text patterns not already included and 2) evaluating cases with keywords of interest but not containing ICDs meeting case definition to determine text patterns for exclusion. The sensitivity and positive predictive value (PPV) statistical measures are computed for each classification.

Results

During December 1, 2013 to March 31, 2014, eleven emergency departments frequently provided ICD diagnosis codes were used for this study. Based on this validation project, the anxiety/adjustment, mood, psychotic disorders and alcohol use classifications achieved a moderate-high sensitivity of 58.6% (PPV: 77.6%), 57.1% (PPV: 88.6%), 63.2% (PPV: 52.6%) and 93.7% (PPV: 66.6%), respectively. Suicide/self-inflicted injury had a low sensitivity of 37.6% (PPV: 51.2%). Methadone/opiate/heroin use achieved a moderate sensitivity of 64.7% but a low positive predictive value of 14.4%. Based on the validated keywords, seen in Figure 1, the anxiety/adjustment disorders showed slightly higher ED visits during the first week of Sandy; mood disorders also increased slightly several days after the storm; alcohol related ED visits followed the weekday/weekend pattern; suicide/self-inflicted ED visits rates were elevated after approximately one week post-storm; ED visits for methadone/opiate/heroin use increased slightly during several days in the storm's aftermath.

Conclusions

Validation results indicated a moderately-high sensitivity and PPV for anxiety/adjustment, mood, psychotic, and alcohol classifications and a low sensitivity for suicide/self-inflicted ED visits; methadone/opiate/heroin ED visits had a low positive predictive value. Validated keywords from the chief complaint field of ED visits can provide meaningful information for NJDOH syndromic surveillance staff to track mental health related illnesses (e.g. anxiety/adjustment, mood, psychotic, and alcohol) before, during and after a severe weather event. For those two classifications with low sensitivity and PPV, additional validations are needed. Currently not all facilities provide ICD-9 codes in EpiCenter for keyword validation. However, NJDOH continues to recruit hospitals to provide ICD information for future validation and evaluation.



Keywords

Syndromic Surveillance; Classification; Severe Weather Event; EpiCenter; New Jersey

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