

Customizing ESSENCE Queries for Select Mental Health Sub-indicators

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Objective

Emergency department (ED) visits related to mental health (MH) disorders have increased since 2006 [1], indicating a potential burden on the healthcare delivery system. Surveillance systems has been developed to identify and understand these changing trends in how EDs are used and to characterize populations seeking care. Many state and local health departments are using syndromic surveillance to monitor MH-related ED visits in near real-time. This presentation describes how queries can be created and customized to identify select MH sub-indicators (for adults) by using chief complaint text terms and diagnoses codes. The MH sub-indicators examined are *mood and depressive disorders*, *schizophrenic disorders*, and *anxiety disorders*. Wider adoption of syndromic surveillance for characterizing MH disorders can support long-term planning for healthcare resources and service delivery.

Introduction

Syndromic surveillance systems, although initially developed in response to bioterrorist threats, are increasingly being used at the local, state, and national level to support early identification of infectious disease and other emerging threats to public health. To facilitate detection, one of the goals of CDC's National Syndromic Surveillance Program (NSSP) is to develop and share new sets of syndrome codes with the syndromic surveillance Community of Practice. Before analysts, epidemiologists, and other practitioners begin customizing queries to meet local needs, especially monitoring ED visits in near-real time during public health emergencies, they need to understand how syndromes are developed.

More than 4,000 hospital routinely send data to NSSP's BioSense Platform, representing about 55 percent of ED visits in the United States [2]. The platform's surveillance component, ESSENCE,* is a web-based application for analyzing and visualizing prediagnostic hospital ED data. ESSENCE's Chief Complaint Query Validation (CCQV) data source, which is a national-level data source with access to chief complaint (CC) and discharge diagnoses (DD) from reporting sites, was designed for testing new queries.

Methods

We used ESSENCE CCQV to query weekly data for the nine week period from the first quarter of 2018 and looked at three common MH sub-indicators: *mood and depressive disorders*, *schizophrenic disorders*, and *anxiety disorders*. We developed four query types for each MH sub-indicator. Query-1 focused on DD codes; query-2 focused on CC text terms; query-3 focused on a combination of CC, DD, and no exclusion for mental health co-morbidity; and query-4 focused on a combination of CC and DD and excluded mental health co-morbidity. We also examined the summary distribution of CC texts to identify keywords related to MH sub-indicators.

For *mood and depressive disorders*, we queried ICD-9 codes 296, 311; ICD-10 codes F30–F39; CC text terms for words “depressive disorder,” “bipolar disorder,” “mood disorder,” “depression,” “manic episodes,” and “psychotic.” For *schizophrenic disorders*, we queried ICD-9 codes 295; ICD-10 codes F20–F29; CC text terms for words “psychosis,” “psychotic,” “schizo,” “delusional,” “paranoid,” “auditory,” “hallucinations,” and “hearing voices.” For *anxiety disorders*, we queried ICD-9 codes 300, 306, 307, 308, 309; ICD-10 codes F40–F48; CC text terms for words “anxiety,” “anexiy,” “aniety,” “aniexty,” “ansiety,” “anxety,” “anxity,” “anxiety,” “phobia,” and “panic attack.”

Results

We identified 2.3 million average weekly ED visits for the 9-week period queried. Table 1 shows average weekly ED visits of select MH sub-indicators from the four query types. Because query 4 focused on specific MH outcomes and excluded MH co-morbidities, the average weekly ED visit for all three sub- indicators was almost half that of query 3, which focused on broader



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concepts by including MH co-morbidities. Among *mood and depressive disorders*, query 4 identified on average 23,352 ED visits per week versus 45,504 visits per week for query 3. Similarly, for *schizophrenic disorders* and *anxiety disorders*, query 4 identified on average 4,988 and 32,790 visits per week compared with 9,816 and 53,868 visits, respectively, for query 3. Further, more MH-related visits were identified using the DD-coded query (query 1) than CC-based text terms (query 2).

Conclusions

Analysts can benefit from having queries on select sub-indicators readily available and can use these to facilitate routine MH-related monitoring of ED visits, or customize the queries by including local text terms. Consistent with our previous work [3], this analysis demonstrated that MH-related ED visits are more likely to be found in DD codes than in CC alone.

* Electronic Surveillance for the Early Notification of Community-based Epidemics

References

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2. Gould DW, Walker D, Yoon PW. 2017. The Evolution of BioSense: Lessons Learned and Future Directions. *Public Health Rep.* 132(Suppl 1), 7S-11S. [PubMed https://doi.org/10.1177/0033354917706954](https://doi.org/10.1177/0033354917706954)
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Table 1. Average weekly emergency department visits for 9-week period during first quarter of 2018 for select mental health sub-indicators

| Mental Health Sub-indicators | Emergency Department Visits Mean (SD) | | | |
|-------------------------------|---------------------------------------|--------------|----------------|----------------|
| | Query 1 | Query 2 | Query 3 | Query 4 |
| Mood and depressive disorders | 42,533 (1,982) | 6,867 (387) | 45,504 (2,098) | 23,762 (521) |
| Schizophrenic disorders | 7,436 (305) | 2,303 (88) | 9,816 (353) | 4,988 (164) |
| Anxiety disorders | 48,050 (2,445) | 11,710 (650) | 53,868 (2,745) | 32,790 (1,925) |



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