

Using ESSENCE to Meet Local Needs for Mental Health Data: Query & Results

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Objective

In order to meet local mental health surveillance needs, we created multiple mental health-related indicators using emergency department data from the Colorado North Central Region (CO-NCR) Early Notification of Community Based Epidemics (ESSENCE), a Syndromic Surveillance (SyS) platform.

Introduction

Mental health is a common and costly concern; it is estimated that nearly 20 percent of adults in the United States live with a mental illness [1] and that more money is spent on mental illness than any other medical condition [2]. One spillover effect of unmet mental health needs may be increasing emergency department utilization. National analysis by Healthcare Cost and Utilization Project (H-CUP) found a 55% increase in emergency department visits for depression, anxiety, and stress reactions between 2006-2013 [3]. Local public health agencies (LPHAs) can play an important role in reducing costs and burden associated with mental illness. There is opportunity to use emergency department data at a local level to monitor trends and evaluate the effectiveness of local strategies. ESSENCE, available in 31 states, provides near-real time observation-level emergency department data, which can be analyzed and disseminated according to local needs. Using ESSENCE data from 6 local counties in Colorado, we developed methods to estimate the overall burden of mental health and specific mental health disorders seen in the emergency department.

Methods

Boulder County Public Health expanded on existing methods to develop multiple mental health queries in ESSENCE using data from the six Colorado counties that currently participate in the Colorado North Central Region (CO-NCR) SyS (i.e., Adams, Arapahoe, Boulder, Denver, Douglas, and Jefferson Counties). Our query was based solely off relevant International Classification of Disease version 10 Clinical Modification (ICD-10-CM) mental health codes: F20-F48, F99, R45.851, X71–X83, T14.91, and R45.851. We also included T36-T65 and T71 where intentional self-harm was specified. In addition to an overall mental health query we created 11 sub-queries for: anxiety disorder, conversion disorder, intentional self-harm/suicide attempt, mood disorder, obsessive compulsive disorder (OCD), dissociative disorder, schizophrenia, somatoform disorders, stress adjustment disorder, suicide ideation, and other mental health disorder). One observation could fall into multiple subcategories through inclusion of multiple discharge diagnosis (DD).

One challenge of using the DD field in ESSENCE is that in Colorado, similar to other states, there can be excess of 40 unique ICD-10-CM codes listed in the DD field, and queries identify cases by searching all listed codes. For this project, that is problematic as codes may refer to historic and underlying health conditions, rather than acute cause of the ED visit. To handle this, we performed a secondary analysis to determine whether observations were “true mental health cases” based on order of codes listed in DD field, triage notes and chief complaint. We then calculated sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of including observations where mental health was listed as the first (or primary) code, first or second, or first second or third code. Our analysis revealed that observations where mental health codes are listed later were less likely to be identifiable as true mental health cases, and led to our decision to only include observations with qualifying codes listed first or second. To assess the mental health burden, we developed code in SAS 9.4 that parsed ESSENCE output by discharge diagnosis, create aforementioned sub-queries, and calculated counts and age-adjusted rates (based on 2000 US Population) to summarize demographic and geographic trends.

Results

There were 22,451 observations with mental health discharge diagnosis codes for the six Colorado counties between January and June 2018. Of these codes, 13,331 had a mental health code as the first and/or second listed DD and were counted as true mental health visits. The age-adjusted rates of any mental health visit ranged from approximately 425 per 100,000 in Douglas County to 1,026 per 100,000 in Denver County. The most common reasons for mental health visits across the region were anxiety, mood disorder, and suicide ideation (Figure 1). There was a significant spike in mental health ED visits among the 15-24 age group,



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followed by decreasing rates in older age groups (Figure 2). Younger age groups most commonly had ED visits for mood disorder (all age groups under 24), while in the age groups 25-34, 35-44, 65-74 and 75+ the most common reason for ED visit was anxiety. Also of note, ED visits for suicide ideation and self-harm were highest for the 15-24 age group. Males and females had similar rates of ED visits for most diagnoses, which is notable given males generally utilize healthcare services at lower rates than females.

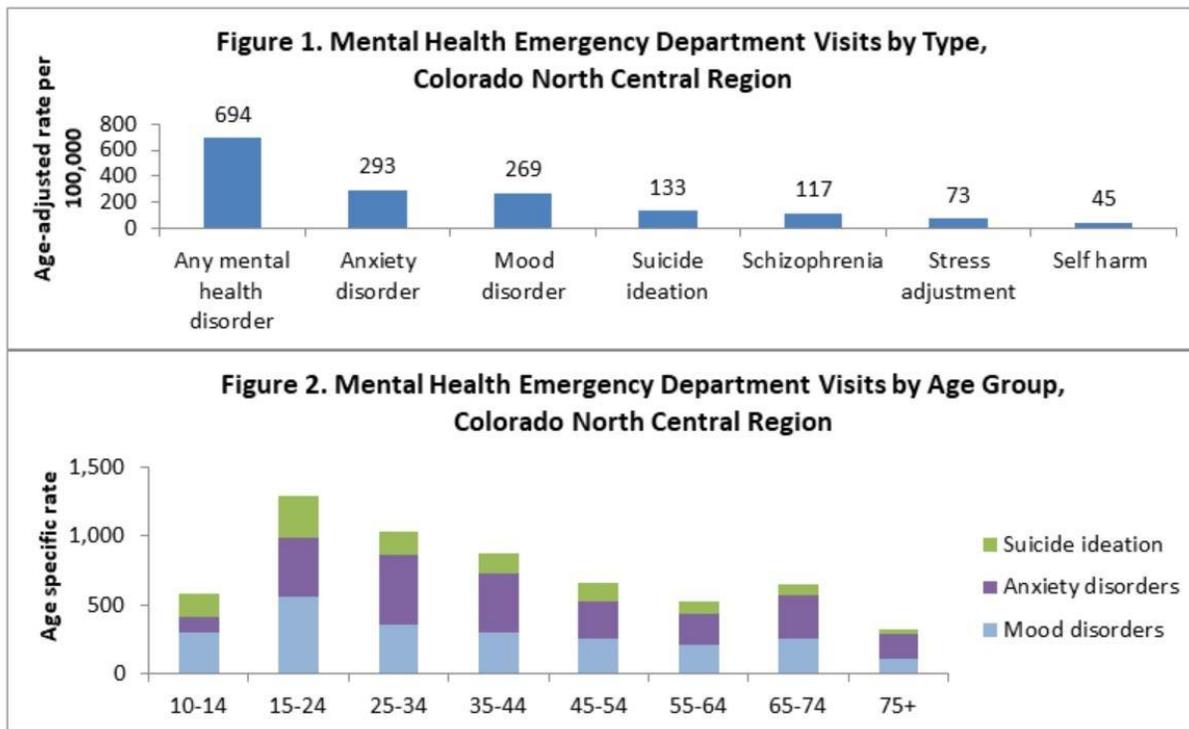
Conclusions

Syndromic surveillance is a valuable addition to available mental health surveillance. Our methods and results demonstrate the feasibility of tracking overall and specific mental health trends using the ESSENCE platform. Unlike other available mental health data, ESSENCE provides data that is local, observation level, and near-real time. Through continued collaboration with public health, medical and other stakeholders we hope this data can be pivotal in gauging disparities in mental health burden, monitoring trends, and prioritizing solutions.

References

1. Mental Illness. National Institute of Mental Health. <https://www.nimh.nih.gov/health/statistics/mental-illness.shtml>
2. Roehrig C. 2016. Mental Disorders Top The List Of The Most Costly Conditions In The United States: \$201 Billion. *Health Aff (Millwood)*. 35(6), 1130-35. <https://www.healthaffairs-org.ezp.welch.jhmi.edu/doi/pdf/10.1377/hlthaff.2015.1659>. [PubMed](https://doi.org/10.1377/hlthaff.2015.1659)
3. Weiss AJ, Barrett ML, Heslin KC, Stocks C. Trends in Emergency Department Visits Involving Mental and Substance Use Disorders, 2006-2013. HCUP Statistical Brief #216. Agency for Healthcare Research and Quality. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb216-Mental-Substance-Use-Disorder-ED-Visit-Trends.pdf>. December 2016.

Figures 1-2



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