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ABSTRACT

Syndrome evaluation of individuals reporting emergency department utilization for notifiable disease and conditions

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Objective
This paper characterizes emergency department (ED) utilization among individuals diagnosed and reported with notifiable diseases and conditions (NDC). Furthermore, it evaluates the subsequent assignment of syndromic surveillance (SS) syndromes based on the patient's chief complaint (CC) during their ED visit.

Introduction
The Duval County Health Department (DCHD) serves a community of over one million people in Jacksonville, FL, USA. Each year, DCHD Epidemiology Program reports an average of 1133 (4-year average) NDC with the exception of STD/HIV, TB, and viral hepatitis. Within Duval County, emergency medical care is provided by eight local hospitals, including one pediatric facility and a level-1 trauma center. These facilities contribute SS CC data to the Electronic Surveillance System for Early Notification of Community-based Epidemics (ESSENCE) of Florida.

Historically, evaluations of SS systems have used ICD-9 diagnoses as the gold standard to determine predictive values.[1] However, limited studies have surveyed reports of NDC to identify related ED visits and subsequent CC-based syndrome categorization. These data may provide public health investigators insight into health seeking behaviors, interpretation of SS signals, and prevalence of NDC within ED data.

Methods
Between March and August 2010, DCHD epidemiology investigators collected ED visitation history from reported cases of NDC. ED usage during their course of illness was documented. An ESSENCE review was then conducted to match cases reporting ED visitation. To reduce the burden on hospital staff, cases were matched by ED, date of visit, age, zip code, sex, and race, instead of ESSENCE unique patient identifier. Case investigation data was then abstracted from Merlin, NDC reporting registry of Florida. ESSENCE syndromes were compared with appropriate NDC-specific syndromes determined by CDC ICD-9-based syndrome definitions.[2] Prevalence of notifiable diseases within ED SS data was evaluated. Comparisons between populations using ED services and those not reporting ED visitation were made.

Results
From 11 March 2010 to 20 August 2010, 486 NDC were reported by DCHD. In all, 61 cases were not directly interviewed. Of the remaining 425, 53.2% (226) reported visiting an ED during the course of their illness. Of these, 198 (87.6%) were diagnosed through the ED or during admission. The remaining 28 were diagnosed during subsequent visits to clinics or primary care providers. In all, 200 cases were able to be matched to the corresponding ED visits in ESSENCE. In addition, 13 cases reported two ED visits and 1 reported three visits for their illnesses; comprising a total of 215 visits associated with NDC.

Regarding syndrome classification, 58.14% (125/215) of syndromes were correctly matched. In addition, 14.8% (32/215) of visits were assigned to the 'other' category and not identified appropriately as a syndrome based on the reported NDC. The rash syndrome category had the highest proportion of matches. The gastrointestinal illness (GI) category had the highest frequency of related ED visits. The GI category also had the highest proportion of CC misclassified as a single syndrome; 30/154 (19.5%) classified in the fever syndrome. This was most prominent among children <2 years old.

Conclusions
This study provides an evaluation of syndrome classification among individuals with reported NDC. In addition, this review revealed limitations for the use of SS data to provide trends for NDC. For instance, children <2 years old are

non-verbal and as a result, signs such as fever and rash can predominate CC of the caregiver. This was demonstrated by the misclassification of reported enteric illnesses within the fever syndrome among children <2 years old. Individuals may also present to EDs for unrelated illnesses and later be diagnosed with a NDC. Also, the seasonality of enteric NDC may have resulted in higher frequencies of GI visits during the study period. Overall, collection and evaluation of ED visitation histories during NDC case interviews has improved the local interpretation of SS signals and provided context for syndromic and NDC surveillance.

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References

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