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# What's the Buzz About Arboviral Disease Syndromic Surveillance?

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## Objective

To validate arboviral syndromes and evaluate the utility and practicality of detecting and monitoring arboviral disease using ED chief complaint, admit reason and diagnosis text data.

## Introduction

The Louisiana Office of Public Health (OPH) Infectious Disease Epidemiology Section conducts emergency department (ED) syndromic surveillance using the Louisiana Early Event Detection System (LEEDS). LEEDS automatically processes electronic chief complaint, admit reason and diagnosis data to identify ED visits indicative of specific syndromes. In response to local transmission of chikungunya virus in the Caribbean and the first travel-associated case in Louisiana in May of 2014, OPH conducted an arboviral syndromic surveillance study to validate arboviral syndromes and evaluate the utility and practicality of detecting and monitoring arboviral disease using ED chief complaint, admit reason and diagnosis text data.

## Methods

OPH developed four syndromes that were applied to statewide ED chief complaint, admit reason and diagnosis text data from April 19, 2014 through August 8, 2015 to monitor arboviral febrile illness: a travel syndrome to capture mentions of international travel, particularly travel to the Caribbean; a chikungunya syndrome to capture specific mentions of chikungunya; an arboviral syndrome to capture other arboviral diseases or insect bites and fever; and a fever and joint pain syndrome. OPH conducted chart reviews of a sample of the records captured by the four syndromes to evaluate if they may have been arboviral cases. Each case reviewed was classified as a confirmed arboviral case, possible arboviral, or non-arboviral based on clinical presentation and any lab work done. OPH also reconciled reported cases of chikungunya and dengue over the period with the syndromic surveillance data to identify which, if any, were captured by the four syndromes.

## Results

The four syndromes captured a total of 165 patients during the study period. The majority of the patients (129) were captured by the arboviral syndrome, followed by 33 fever and joint paint (one patient fell under both arboviral and fever and joint pain syndromes), 2 chikungunya and 2 travel. Of the 165 patients, OPH conducted chart reviews of 67 patients: 5 were classified as confirmed arboviral cases, 3 as possible arboviral, and 59 as non-arboviral. 48 of the 129 patients captured by the arboviral syndrome were reviewed: 2 were confirmed arboviral, 3 were possible arboviral, and 43 were non-arboviral. 16 of the 33 patients captured by the fever and joint pain syndrome were reviewed: 1 was possible arboviral and 15 were non-arboviral. 2 patients were captured by the chikungunya syndrome, both of which were confirmed arboviral, and 2 by the travel syndrome, 1 of which was confirmed arboviral and 1 non-arboviral. The confirmed arboviral cases consisted of 3 chikungunya cases and 2 West Nile cases. Reconciliation of reported chikungunya and dengue cases against the syndromic surveillance data revealed that most were not captured because of lack of specificity in the chief complaint or admit reason, for example "fever," "generalized weakness," or "viral illness."

## Conclusions

This study demonstrated that using ED chief complaint, admit reason and diagnosis text data to monitor and detect arboviral disease is a difficult task. Arboviral illness usually begins with common symptoms that could be indicative of many different diseases, and a review of reported chikungunya and dengue cases confirmed that chief complaint and admit reason are often non-specific and therefore difficult to capture with text syndromes. The arboviral and fever and joint pain syndromes were too sensitive, often picking up insect bites resulting in abscesses or allergic reactions (arboviral) or chronic conditions (fever and joint pain). Alternatively, the travel and chikungunya syndromes were too specific, since chief complaint and admit reason data rarely include specific arboviral disease names or travel history information. While specific arboviral disease can be detected in diagnosis information, diagnosis is not always included in syndromic surveillance data. Due to these constraints, in this study only 7% of reviewed cases were confirmed arboviral cases, 4% were possible arboviral, and 88% were non-arboviral. Therefore, while a small number of confirmed arboviral cases were detected, ED syndromic surveillance based on chief complaint, admit reason and diagnosis text data is not a practical method for detecting arboviral disease and does not provide an accurate indicator to monitor arboviral disease.

## Keywords

arboviral; syndromic surveillance; Chikungunya

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