

## Electronic tracking of influenza-like illness incidence in an outpatient population

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### Objective

Evaluate the use of an electronic health record (EHR) network to track influenza-like illness (ILI) incidence in an outpatient population and, using laboratory testing, identify influenza cases by subtype as well as other respiratory viruses.

### Introduction

Using an EHR system, we tracked an outpatient population from a series of primary care providers to identify ILI as part of a multistate effort directed by the Centers for Disease Control and Prevention. From these patients, we also collected de-identified project-specific information and symptoms using an electronic template to evaluate possible differences among patient groupings as well as longitudinal population patterns.

### Methods

We selected a series of providers using NYC DOHMH's EHR network, from which we could obtain practice characteristics (i.e., number of patient visits, type of practice and age distribution) and evaluation score developed to rate a practice's ability to use EHRs. We then set up an electronic template at each practice and scheduled the transmission of a report with de-identified patient characteristics and patient counts. Nasopharyngeal samples were collected from each patient presenting with ILI to test for influenza subtypes including influenza A (H1, H3 and H1N1) and influenza B by RT-PCR. Samples negative for influenza were tested for other respiratory viruses including rhinovirus, metapneumovirus (MPV), respiratory syncytial virus (RSV), parainfluenza virus (PIV) and adenovirus by RT-PCR by Luminex. We analyzed the data for completeness to evaluate the success of electronic surveillance. We also compared the data by gender, age group, symptoms as well as evaluated virus frequency over time.

### Results

Compared to paper-based records, EHR-based tracking reduced time and manpower requirements by the automation of data acquisition from each practice and improved capabilities for determining ILI incidence by reporting a patient denominator along with the number of ILI cases. Proper training and selecting the right practice played a large role in that success. Some initial challenges included providers overlooking the symptomology associated with ILI in the CDC guidelines, which led to failing to identify ILI cases and unfamiliarity with the electronic template. This was especially an issue in a larger practice that had a large number of rotating staff.

The results of PCR testing for influenza subtypes evolved from almost exclusively H1N1 in 2009–2010 to the cocirculation of H1N1, seasonal H3 and influenza B in 2010–2011. Luminex testing was only performed in 2010–2011, and we found that rhinovirus and MPV were most common and were present over most of the season. Other viruses showed peaks at certain times of the year.

### Conclusions

This project demonstrates that EHRs can improve surveillance capabilities by streamlining and standardizing reporting. This can help to establish a more sophisticated reporting tool using gold standard methods on a larger scale, which will in turn improve public health by providing information on the most common circulating virus at the time of diagnosis, and especially in the event of outbreaks such as pandemic H1N1. In addition, longer term longitudinal use of EHRs for this type of surveillance can determine whether the pattern observed one season is repeated the next.

### Keywords

Electronic health record system; influenza-like illness; surveillance; influenza

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