

A Comparison of Locally Developed Influenza-like Syndrome Definitions Using Electronic Emergency Department Data in Boston and New York City

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OBJECTIVE

To compare locally-developed influenza-like syndrome definitions (derived from emergency department (ED) chief complaints) when applied to data from two ISDS DiSTRIBuTE Project participants: Boston and New York City (NYC) [1].

BACKGROUND

ED-based syndromic surveillance is used by many health departments to monitor and characterize seasonal influenza. The DiSTRIBuTE project facilitates visualizations of aggregate, influenza like, emergency department data from existing syndromic surveillance systems. Due to local analytic needs and variations in how chief complaints are coded, distinct syndrome definitions are often developed by individual health departments [2, 3]. The BPHC collects data daily from 10 of 10 EDs in the city of Boston (avg daily visits ~ 1300). The NYCDOHMH collects data daily from 50 of 61 (82%) EDs in NYC representing 94% of all ED visits (avg daily visits ~ 10,000). Each department uses both a broad (more sensitive) and narrow (more specific) influenza-like syndrome definition to track age-specific ED morbidity patterns during influenza season. In order to analyze data across jurisdictions, it is necessary to understand how these data and definitions differ.

METHODS

Broad and narrow influenza-like syndrome definitions in use in Boston and NYC were applied to ED syndromic surveillance data from both jurisdictions. Weekly proportions of both definitions from October 2, 2005 to May 17, 2008 were calculated for each site for all ages and 6 age groups (<2, 2-4, 5-17, 18-44, 45-64, 65+). Time series graphs of weekly proportions (for each definition) and local influenza isolates were created for all ages and 6 age groups. The syndrome definitions were compared to each other and to the isolate data using Pearson's correlation coefficients.

RESULTS

The Boston and NYC narrow syndrome definitions were highly correlated with each other when applied to both Boston's all ages syndrome data (0.95) and NYC's all ages syndrome data (0.99). For all ages, during each of the 3 influenza seasons analyzed, both narrow syndrome definitions were better correlated

with the isolate data from each city (range 0.70 - 0.84, $p < 0.001$) than the broad definitions (range 0.42 - 0.68, $p < 0.001$). The highest correlations were seen when applying the narrow definition to isolate data and age-stratified ED data during each influenza season (range 0.33 - 0.93, $p < 0.001$). In all cases, the narrow definition used by the jurisdiction categorized a greater magnitude of visits as influenza-like than did the other city's local definition.

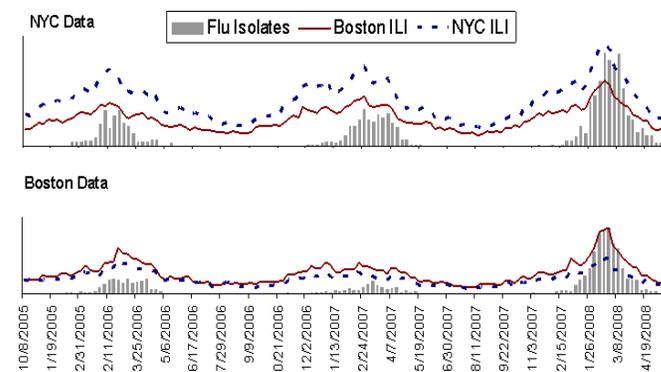


Figure – Proportion of influenza like ED visits by week. Boston narrow definition and NYC narrow definition applied to data from Boston and NYC.

CONCLUSIONS

Although the different narrow definitions each correlated with each city's data, the improved performance when local definitions were applied to local data suggests that nuances may be lost if one definition was used across jurisdictions. Informing the articulated federal need for linked surveillance networks "built on existing [local] situational awareness systems" [4], this project is a first step in comparing locally-developed influenza-like syndrome definitions to each other and to influenza isolate data across jurisdictions. The primary limitations of the study were lack of geographic, demographic and analytic diversity among locations. Next steps include incorporating definitions and data from other diverse jurisdictions.

REFERENCES

- [1] <http://www.syndromic.org/projects/DiSTRIBuTE.htm>
- [2] Olson, Heffernan, Paladini, et al. *PLoS Med* 2007;4(8):e247.
- [3] Boston Public Health, *Advances in Disease Surveillance* (2007); 2, :1-15
- [4] Pandemic All-Hazards Preparedness Act (2006).