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Comparison between HL7 and Legacy Syndromic Surveillance Data in New York City

Janette Yung*, Promise Nkwocha, Anthony W. Tam, Ramona Lall and Robert Mathes

Bureau of Communicable Diseases, NYC Department of Health and Mental Hygiene, Queens, NY, USA

Objective

To evaluate potential changes in emergency department (ED) syndromic surveillance data quality, as hospitals shift from sending data as flat file format (Legacy Data) to real-time/batch HL7 Messaging Standard Version 2.5.1, in compliance with Meaningful Use requirements.

Introduction

Data from the Emergency Departments (EDs) of 49 hospitals in New York City (NYC) is sent to the Department of Health and Mental Hygiene (DOHMH) daily as part of the syndromic surveillance system. Currently, thirty-four of the EDs transmit data as flat files. As part of the Center for Medicare and Medicaid Services Electronic Health Record Incentive Program, otherwise known as Meaningful Use, many EDs in our system have switched or are in the process of switching to HL7 Messaging Standard Version 2.5.1. Given there may be differences in data completeness, quality, and content between the new HL7 data and legacy data, we evaluated data sent in both formats in parallel by several EDs.

Methods

We compared the total number of daily visits, syndrome counts, percent completeness of variables, and number of words in the chief complaint field from four hospitals sending parallel data from July 15 2014 to August 15 2014. Syndromes tested include influenza-like illness (ILI), fever-flu, respiratory, diarrhea, and vomit. Variables analyzed for completeness included age, chief complaint, gender, zip code, discharge disposition, and discharge diagnosis (ICD9 or ICD10 code).

Results

Overall, for the four hospitals tested, the total number of daily visits was greater in the new HL7 data (a 10% increase). However, this varied by hospital, with a single hospital accounting for the majority of this increase. There was an overall increase in syndrome counts of ILI (5%), fever-flu (23%), respiratory (24%), diarrhea (35%), and vomit (97%). These changes in syndrome counts also varied by hospital. We observed no difference in percent completeness of the variables age, chief complaint, gender, and zip code between the HL7 data and legacy data. However, the percent completeness for discharge disposition and discharge diagnosis variables in the HL7 data did increase from 53% to 78% and 23% to 87%, respectively. The average word count for chief complaint field increased from 4 to 8.

Conclusions

As hospitals shift from sending syndromic data as flat files to real time/Batch HL7 messaging, parallel testing will become a critical step in maintaining data integrity. Discrepancies in the total visit counts between the parallel data streams and other issues with data quality (e.g., completeness) are reported back to individual hospitals for an explanation or correction, and testing in parallel is discontinued once all issues are resolved. We will continue assisting hospitals as they go through this process, to maintain or improve ED data quality.

Keywords

Syndromic Surveillance; Meaningful Use; HL7; HL7 messages; Data quality, Data assessment

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*Janette Yung
E-mail: jyung@health.nyc.gov