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Evaluation of a Pilot Respiratory Virus Surveillance System Linking Electronic Health Record and Diagnostic Data

Al-Samarrai, Teeb MD, MS; Wu, Winfred MD, MPH; Begier, Elizabeth MD, MPH; Lurio, Joseph MD; Tokarz, Rafal PhD; Plagianos, Marlena MS; Calman, Neil MD; Mostashari, Farzad MD, ScM; Briese, Thomas PhD; Lipkin, W. Ian MD; Greene, Carolyn MD

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Abstract

Context: During the onset of 2009 pandemic influenza A (H1N1) (pH1N1), the New York City Department of Health and Mental Hygiene implemented a pilot respiratory virus surveillance system.

Objectives: We evaluated the performance of this pilot system, which linked electronic health record (EHR) clinical, epidemiologic, and diagnostic data to monitor influenza-like illness (ILI) in the community.

Design: Surveillance was conducted at 9 community health centers with EHRs. Clinical decision support system alerts encouraged diagnostic testing of patients. Rapid influenza diagnostic testing (RIDT) and multiplex polymerase chain reaction assay (MassTag PCR) were performed sequentially.

Setting: Nine Institute for Family Health (IFH) clinics in Manhattan and the Bronx during May 26 to June 30, 2009, the pH1N1 outbreak peak.

Participants: Adult and pediatric patients presenting to IFH clinics during May 26 to June 30, 2009.

Main Outcome Measures: By using Centers for Disease Control and Prevention guidelines, we evaluated the system's completeness, sensitivity, timeliness, and

epidemiologic usefulness.

Results: Of 537 ILI visits (5.7% of all visits), 17% underwent diagnostic testing. Of the 132 specimens with both a RIDT and MassTag PCR result, 90 (68%) had a MassTag PCR-identified respiratory virus, most commonly pH1N1 (n = 69; 77%). Of the 81 specimens that met the ILI case definition, 58 (72%) were positive for a respiratory virus tested for by MassTag PCR; 48 (59%) were positive for pH1N1. Ninety-four percent of ILI patients positive for pH1N1 were 45 years or younger. Sensitivity and specificity of RIDT (29% and 94%) and ILI case definition (70% and 48%) for pH1N1 were calculated using MassTag PCR as the standard. Results of RIDT took a median of 6 days.

Conclusions: Despite low RIDT sensitivity for pH1N1 and limited timeliness, integration of EHR and diagnostic data has potential to provide valuable epidemiologic information, guide public health response, and represents a new model for community surveillance for influenza and respiratory viruses.