

Committee: Infectious Diseases

Title: Influenza Surveillance in the United States

Statement of the Problem:

Influenza is a major public health issue in the United States, causing an estimated 200,000 hospitalizations (1) and 36,000 deaths each year in the United States (2). Substantial public health resources are committed to prevention of influenza and influenza-associated morbidity and mortality, primarily through influenza vaccination, but also including promotion of respiratory hygiene and use of antiviral medications. During the past several years, influenza has received heightened attention because of:

- Increased pediatric mortality during the 2003-4 influenza season (3);
- Widespread resistance of influenza A (H3N2) to adamantanes detected during the 2005-2006 season (7); and resistance to Oseltamivir detected in H1N1 isolates during the 2007-08 influenza season;
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- Increased concerns raised during pandemic influenza planning efforts at the local, state and national level with respect to varying surveillance needs at all levels of government.

Information from public health surveillance is needed to assess the public health burden of seasonal influenza, inform policy makers and the public, promote vaccination efforts, evaluate vaccination strategies, vaccine strain selection, detect changes in influenza viruses including detection of novel viruses with pandemic potential, and to guide public health interventions to limit morbidity and mortality.

The emergence of avian influenza A (H5N1) as a widespread epizootic disease capable of causing severe human disease has increased both the importance of seasonal influenza surveillance and public interest in both seasonal and pandemic influenza. Surveillance systems for seasonal influenza should serve as a foundation for pandemic surveillance. Currently, United States influenza surveillance includes several components (8):

1. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) Collaborating Laboratories.
2. U.S. Influenza Sentinel Providers Surveillance Network.
3. 122 Cities Mortality Reporting System.
4. State and Territorial Epidemiologists Reports.
5. Influenza-associated pediatric mortality.
6. Emerging Infections Program (EIP) - laboratory-confirmed influenza related hospitalizations
7. New Vaccine Surveillance Network (NVSN) -- laboratory-confirmed influenza hospitalization in children less than 5 years old and outpatients 0 – 12 years old.

In addition, other methods are being used in some states, including:

- Influenza-associated hospitalizations (9); syndromic surveillance using emergency department chief complaints (respiratory, systemic/febrile illness); hospitalizations for pneumonia; and over-the-counter sales of medicines. (10-12)

Although the current influenza surveillance system has provided useful information, in 2006, CSTE passed a position statement urging CDC to convene an expert panel to conduct an evaluation of influenza surveillance in the United States. It was requested that such a panel would:

- a) include representatives of local, state, and federal public health agencies and individuals with expertise in influenza, public health surveillance, pandemic preparedness, virology and laboratory testing, immunizations, vaccine development, hospital infection control (i.e., infection control practitioners, hospital epidemiologists), medical and public health informatics, and risk communications.
- b) The evaluation should consider the objectives, uses and value of the components of influenza surveillance at national, state, and local levels for both seasonal epidemics of influenza and during an influenza pandemic. The interaction of U.S. surveillance with global needs should also be considered.
- c) The panel should issue recommendations for influenza surveillance in the United States that balance local, state, and national needs with available resources.
- d) Recommendations should include setting priorities for improvement or change; listing of the resources needed to accomplish any recommended changes; addressing surveillance needs for seasonal influenza and assessing the ability of the surveillance system to serve as a basis for surveillance during an influenza pandemic.
- e) Recommendations for research and evaluation to guide future surveillance system development should be included.
- e) Given the high priority and attention currently being given to pandemic preparedness, this process should be conducted to produce a final report and recommendations by the end of 2006.

In response to this position statement, CDC's Influenza Division did convene such an expert consultation in November 2006 to initiate the process. The main recommendations of the meeting were as follows:

Recommendation #1: Facilitate implementation of electronic death reporting as a means for improving reporting of pneumonia and influenza related deaths.

Recommendation #2: Develop methods for timely assessment of severe influenza disease and health care resource demands including developing standards and definitions for case reporting.

Recommendation #3: Develop methods for expanding laboratory networks within states, electronic laboratory reporting, and data feedback mechanism within states.

Recommendation #4: Develop flexible yet consistent systems for capturing outpatient ILI, specifically focused on expanded use of alternative electronic data sources.

Recommendation #5: Develop standardized definitions for influenza activity including a measure of intensity for the State and Territorial Epidemiologists' Report.

Following the meeting workgroups were established that met throughout 2007 to determine how to implement the recommendations. These groups reported their recommendations to the larger expert consultation panel during a second meeting convened in December 2007.

The expert consultation panel acknowledged that several factors impact influenza surveillance strategies. These include:

- 1) Currently, the approaches to and resources dedicated to influenza surveillance vary markedly from state to state.
- 2) Some components of influenza surveillance work well at the national and international level, but provide little useful information at state and local levels (e.g., influenza mortality, pediatric influenza hospitalizations). Heightened interest in influenza has increased the need for information at state and local levels. In addition, it is unlikely that current surveillance methods would be sustainable or satisfy information needs at state and local levels during an influenza pandemic.
- 3) The current classification system used in the State and Territorial Epidemiologist Reports is problematic in several ways. First, it continues to be very challenging to implement in a standardized manner across states. Secondly, it is potentially confusing to media and policymakers, as it may be interpreted to both describe the seriousness of the seasonal epidemic (i.e., from a mild to a severe flu season) the distribution of cases across different geographical areas...
- 4) The role of syndromic surveillance methods for tracking influenza and in particular the potential redundancy between ILI surveillance and chief complaint surveillance deserves attention.
- 5) Collection of viral isolates is becoming increasingly difficult as practitioners increasingly rely on rapid influenza tests that provide them with real-time clinical information but don't provide a source of information on the types of viruses that are circulating.
- 6) Consideration should be given to integrating seasonal and pandemic influenza surveillance with local, state, and federal surveillance computer systems and surveillance system standards (e.g., NEDSS, PHIN, and the PHIN Preparedness Functional Requirements). Plans should be made to assure that surveillance applications are prepared to manage surveillance data during a pandemic.

The 2007 expert consultation concluded that CDC and CSTE need to have a national surveillance system that moves surveillance toward a unified system versus a piecemeal approach to disease reporting activities. The recommendations of the 2007 consultation are stated in the “Statement of desired actions to be taken” below:

Statement of the desired action(s) to be taken:

1. CDC should publish formal influenza surveillance guidelines by CDC derived from the recommendations made in the two CSTE/CDC Consultations (in the form of R&R or other)
2. CDC should encourage states to develop surveillance systems for influenza associated hospitalization, and influenza associated electronic death reporting. Those states with current, or in the process of developing systems, should work with CDC to develop standards for data format and transmission.
3. By the 2008-09 influenza season, CDC should establish a mechanism to accept data in a standardized format for those states able to send influenza associated hospitalization data and influenza mortality data.
4. The Influenza Division should provide adequate funding for states to enhance surveillance activities and resources should be provided to the Influenza Division by CDC to fund influenza surveillance

Public Health Impact:

Influenza is a major public health issue causing substantial disease and death during seasonal epidemics and with the potential for pandemics of historic magnitude. . As stated in Institute of Medicine report, *Emerging Infections: Microbial Threats to Health in the United States* “The importance of surveillance to the detection and control of emerging microbial threats cannot be overemphasized ” (14). What is needed is a national approach to influenza surveillance that can move this nation from a piecemeal to a more unified and standardized system of disease surveillance.

References

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