

06-ID-04

Committee: Infectious Diseases

Title: Assessment of 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);
- Early onset of influenza season and vaccine mismatch in 2003-2004 (4);
- Vaccine shortages and/or distribution delays during four of the past six seasons (5,6);
- Widespread resistance of influenza A (H3N2) to adamantane-type antiviral medications detected during 2005-2006 season (7); and
- Increased concerns regarding pandemic influenza.

Information from public health surveillance is needed to assess the public health burden of influenza, inform policy makers and the public, promote vaccination, evaluate vaccination strategies, guide vaccine development (antigenic characterization of circulating influenza viruses), 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. Although seasonal surveillance systems will almost certainly need to be enhanced during a pandemic, current influenza surveillance systems should be evaluated for their readiness to serve as the foundation for pandemic surveillance.

Currently, United States influenza surveillance includes these 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 in persons less than 18 years of age.
7. New Vaccine Surveillance Network (NVSN) -- laboratory-confirmed influenza hospitalization rates for children less than 5 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, several factors suggest that a formal assessment of influenza surveillance is needed. 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. Although it is often interpreted by media and policymakers as a linear scale describing the seriousness of the seasonal epidemic (i.e., from a mild to a severe flu season) that scale is actually communicating at least two dimensions of severity. That is, it is used to communicate both how disease occurrence is distributed across geographical areas and the intensity of transmission. For example, a state might have detected influenza transmission at a relatively low level across the state. This might well be appropriately described as “widespread”, yet using that descriptor especially early in the season is likely to be interpreted as indicating a severe influenza season.
- 4) CDC has urged or required through grant requirements that states conduct influenza-like illness (ILI) surveillance year round, but there is little scientific information about the predictive value of either individual ILI reports or an increase of ILI report frequency during non-seasonal influenza time periods. If the intent is to detect a pandemic of influenza, it is highly unlikely that ILI surveillance can meet this need or would be sustainable during a pandemic.
- 5) The role of syndromic surveillance methods for tracking influenza and in particular the potential redundancy between ILI surveillance and chief complaint surveillance deserves attention.
- 6) 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.
- 7) 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.

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

CSTE recommends that CDC convene an expert panel to conduct an assessment and issue recommendations regarding surveillance for influenza in the United States.

a) That panel should 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) This assessment 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.

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. Many assessments of the public health system have emphasized the essential role of surveillance in guiding an effective public health response and the need for strong local, state, and federal cooperation and coordination (13). 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).

References

1. Thompson WW, Shay DK, Weintraub E, et al. Influenza-associated hospitalizations in the United States. *JAMA* 2004;292:1333-1340.
2. CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2004;53(No.RR-6).
3. Bhat N, Wright JG, Broder KR, et al. Influenza-associated deaths among children in the United States, 2003-2004. *N Engl J Med* 2005;353:2559.
4. CDC. Update: Influenza Activity --- United States and Worldwide, 2003--04 Season, and Composition of the 2004--05 Influenza Vaccine. *MMWR* 2004; 53(25);547-552.
5. CDC. Update: Influenza Vaccine Supply and Recommendations for Prioritization During the 2005--06 Influenza Season. *MMWR* 2005; 54(34);850.
6. Treanor J. Weathering the Influenza Vaccine Crisis. *NEJM* 2004;351:2037-2040.
7. CDC. High Levels of Adamantane Resistance Among Influenza A (H3N2) Viruses and Interim Guidelines for Use of Antiviral Agents --- United States, 2005--06 Influenza Season. *MMWR* 2006; 55(02);44-46.
8. CDC. Overview of influenza surveillance in the United States. <http://www.cdc.gov/flu/weekly/fluactivity.htm> (accessed on March 9, 2006).
9. CDC. Surveillance for Laboratory-Confirmed, Influenza-Associated Hospitalizations --- Colorado, 2004--05 Influenza Season. *MMWR* 2005;54(21):535-537.
10. CDC. Hospital Admissions Syndromic Surveillance --Connecticut, October 2001-- June 2004. *MMWR* 2005; 54(Suppl);169-173.

11. CDC. Comparison of Syndromic Surveillance and a Sentinel Provider System in Detecting an Influenza Outbreak --- Denver, Colorado, 2003. *MMWR* 2005; 54(Suppl);151-156.
12. Vergu E, Grais RF, Sarter H, et al. Medication sales and syndromic surveillance, France. *Emerg Infect Dis* [serial on the Internet]. 2006 Mar [accessed March 28, 2006]. Available from <http://www.cdc.gov/ncidod/EID/vol12no03/05-0573.htm>
13. Institute of Medicine. *The Future of the Public's Health in the 21st Century*. The National Academies Press, 2003; Washington, DC.
14. Institute of Medicine. *Emerging Infections: Microbial Threats to Health in the United States*. National Academy Press, 1992; Washington, DC.

Coordination:

Agency for Response:

- (1) Julie Gerberding, MD, MPH
Director
Centers for Disease Control and Prevention
1600 Clifton Road, NE, MS D-14
Atlanta, Georgia 30333
404-639-7000
jyg2@cdc.gov

Agencies for Information:

- (1) Paul E. Harris, MD, MBA
Executive Director, Association of State and Territorial Health Officers
1275 K Street NW, Suite 800
Washington, DC 20005
(202) 371-9090
Ghardy@astho.org
- (2) Scott Becker
Executive Director
Association of Public Health Laboratories
2025 M Street NW, #550
Washington, DC 20036-3320
(202) 822-5227
Sbecker@aphl.org
- (3) Patrick Libbey
Executive Director
National Association of City and County Health Officers
1100 17th Street 2nd floor
Washington, D.C. 20036
202-783-5550
plibbey@naccho.org
- (4) Rex Archer, MD, MPH
President, National Association of County and City Health Officials
Director of Health
Kansas City Health Department
2400 Troost Avenue, Suite 4000
Kansas City, MO 64108
(816) 513-6252
rex_archer@kcmo.org
- (5) Bruce Gellin, M.D., M.P.H.
Director, National Vaccine Program Office
U.S. Department of Health & Human Services
200 Independence Avenue, S.W.
Washington, D.C. 20201
(202) 690-5566
BGellin@OSOPHS.DHHS.GOV

Submitting Author:

- (1) Robert T Rolfs, MD, MPH
State Epidemiologist
Bureau of Epidemiology, Utah Department of Health
PO Box 142104 (For overnight mail only, use: 288 North 1460 West)
Salt Lake City, Utah 84114-2104
801-538-6191
rolfs@utah.gov

Co-Author:

- (1) Ken Gershman, MD, MPH
Chief, Communicable Disease Epidemiology
Colorado Department of Public Health
4300 Cherry Creek Drive South
Denver, Colorado 80246
(303) 692-2657
ken.gershman@state.co.us