



March 2007: VOLUME 1, NUMBER 5

The 2006/2007 Influenza Season: An Epidemiologic Snapshot

In this issue...

Over the past year, both the general press and the medical establishment have expressed concerns about the 2006/2007 influenza season. While fears of a potential avian flu pandemic have captured most of the headlines, other, more immediate, questions have been asked, including:

- How virulent has this year's seasonal influenza virus been?
- How closely have the components of the influenza vaccine matched the affecting strains?
- Has this season shown an increased or decreased morbidity and mortality in the higher-risk groups, particularly in children?

In this issue – in a departure from our usual format – we review the data provided by the CDC to present an epidemiologic "snapshot" at week 10 of the 2006/2007 influenza season.

THIS ISSUE

- [SURVEILLANCE OVERVIEW](#)
- [CURRENTLY CIRCULATING INFLUENZA VIRUSES](#)
- [CIRCULATING VIRUS AND THE 2006/2007 VACCINE](#)
- [U.S. EPIDEMIOLOGY](#)
- [SEVERITY](#)
- [COMPOSITION OF THE 2007/2008 INFLUENZA VACCINE](#)
- [VACCINE & ANTIVIRALS](#)
- [SUMMARY](#)

Course Directors

John G. Barlett, MD

Professor of Medicine
Department of Medicine
The Johns Hopkins University
School of Medicine

Jason E. Farley, PhD(c), MPH, NP

Adult Nurse Practitioner,
Infectious Disease
Clinical Instructor
Department of Medicine
The Johns Hopkins University
School of Medicine

GUEST EDITOR OF THE MONTH



Commentary & Reviews:

Michael L. Tapper, MD
Hospital Epidemiologist
Director, Division of
Infectious Diseases
Lenox Hill Hospital
New York, New York

Guest Faculty Disclosure

Michael L. Tapper, MD, has no relationship with commercial supporters.

Unlabeled / Unapproved Uses

The author has indicated that there will be no reference to unlabeled/unapproved uses of drugs or products in this presentation.

Program Information

[CE Info](#)
[Accreditation](#)
[Credit Designations](#)
[Target Audience](#)
[Learning Objectives](#)
[Internet CME/CNE Policy](#)
[Faculty Disclosure](#)
[Disclaimer Statement](#)

Length of Activity

1.0 hours Physicians
1.2 hours Nurses

Expiration Date

March 29, 2009

Next Issue

April 27, 2007

COMPLETE THE POST TEST

Step 1.

Click on the appropriate link below. This will take you to the post-test.

Step 2.

If you have participated in a Johns Hopkins on-line course, login. Otherwise, please register.

Step 3.

Complete the post-test and course evaluation.

Step 4.

Print out your certificate.

PHYSICIAN
POST-TEST

NURSE
POST-TEST

Pharmacy credit is only available via PDF mail-in form:

PHARMACY
POST-TEST

LEARNING OBJECTIVES

The Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing take responsibility for the content, quality, and the scientific integrity of this CE activity.

At the conclusion of this activity, participants should be able to:

- Identify the primary influenza viruses currently circulating in the US
- Compare the primary circulating influenza viruses with the 2006/2007 influenza vaccine components
- Discuss the reported morbidity and mortality attributed to influenza thus far this season

SURVEILLANCE OVERVIEW

The Influenza Branch at the CDC collects and reports information on influenza activity in the United States each week from October through May. The U.S. influenza surveillance system has seven components, which together are designed to provide a national picture of influenza activity. Data is collected from:

- The U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) Collaborating Laboratories: These 130 laboratories, located throughout the United States report the total number of respiratory specimens tested and the number confirmed positive for influenza types A and B each week.
- The U.S. Influenza Sentinel Providers Surveillance Network: Each week, approximately 1,200 healthcare providers around the country voluntarily report the total number of patients seen and the number of those patients with influenza-like illness (ILI), defined as fever of $>100^{\circ}\text{F}$ and a cough and/or sore throat in the absence of a known cause other than influenza.
- The 122 Cities Mortality Reporting System: Weekly, the Vital Statistics Offices of 122 cities around the country report the number of death certificates received for which pneumonia or influenza was listed as the underlying or contributing cause of death. The percentage of all deaths due to pneumonia and influenza are compared with a seasonal baseline, and an epidemic threshold value is calculated for each week.
- State and Territorial Epidemiologists Reports: State health departments report the estimated level of influenza activity in their states each week.
- Influenza-associated pediatric mortality: This newly added component reports laboratory-confirmed influenza-associated deaths in children less than 18 years old, and reports through the Nationally Notifiable Disease Surveillance System.
- Emerging Infections Program (EIP): This component reports every two weeks during the influenza season on laboratory-confirmed influenza-related hospitalizations in persons less than 18 years of age in 60 counties, covering 12 metropolitan areas in 10 states.
- The New Vaccine Surveillance Network (NVSN): This network provides bi-weekly population-based estimates of laboratory-confirmed influenza hospitalization rates for children less than 5 years old residing in three counties (in Ohio, Tennessee, and New York).

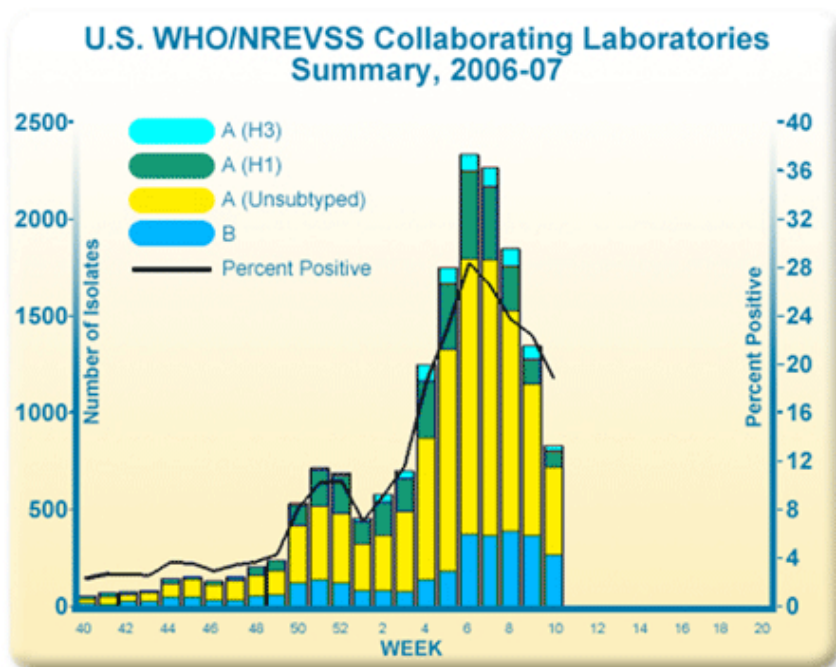
CURRENTLY CIRCULATING INFLUENZA VIRUSES

Since October 1, 2006, U.S. laboratories reporting to the CDC have tested a total of 128,223 specimens for influenza viruses, with 16,602 (12.9%) found positive. Antigenic characteristics have been determined for 325 influenza viruses: to date, about two-thirds (200) have been H1N1, and a relatively small number (25) have



been the more severe H3N2 subtype. The (100) remaining viruses have been influenza B, which is generally considered a less severe human pathogen.

A graphic summary of these data, collected by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) laboratories, appears below:



During week 10 of this current flu season, the WHO and NREVSS laboratories reported 4,417 specimens tested for influenza viruses, 830 (18.8%) of which were positive: 86 influenza A (H1) viruses, 29 influenza A (H3) viruses, 448 influenza A viruses that were not subtyped, and 267 influenza B viruses.

If the predominating circulating virus remains H1N1, it appears the U.S. is on track for a relatively mild flu season that falls within (or below) normal seasonal variation.

CIRCULATING VIRUS AND THE 2006/2007 VACCINE

Further reinforcing this indication of a mild influenza season is the match of the 2006-07 influenza vaccine to the currently circulating viruses. The CDC reports:

- 189 (95%) of the 200 H1 viruses characterized were similar to A/New Caledonia/20/99-like, which is the influenza A (H1) component of the 2006-07 influenza vaccine.
- 11 (5%) of the 200 viruses showed somewhat reduced titers with antisera produced against A/New Caledonia/20/99 and are similar to A/Solomon Islands/3/2006-like.
- 12 (48%) of the 25 H3 viruses were characterized as A/Wisconsin/67/2005-like, which is the influenza A (H3) component of the 2006-07 influenza vaccine.
- 13 (52%) of the 25 H3 viruses showed somewhat reduced titers with antisera produced against A/Wisconsin/67/2005.
- 71 (71%) of the 100 influenza B viruses characterized belong to the B/Victoria lineage of viruses.
- 42 (59%) of these 71 viruses were similar to B/Ohio/01/2005, the B component of the 2006-07 influenza vaccine.

RECOMMEND TO A COLLEAGUE

NEWSLETTER ARCHIVE

- 29 (41%) of these 71 viruses showed somewhat reduced titers with antisera produced against B/Ohio/01/2005.

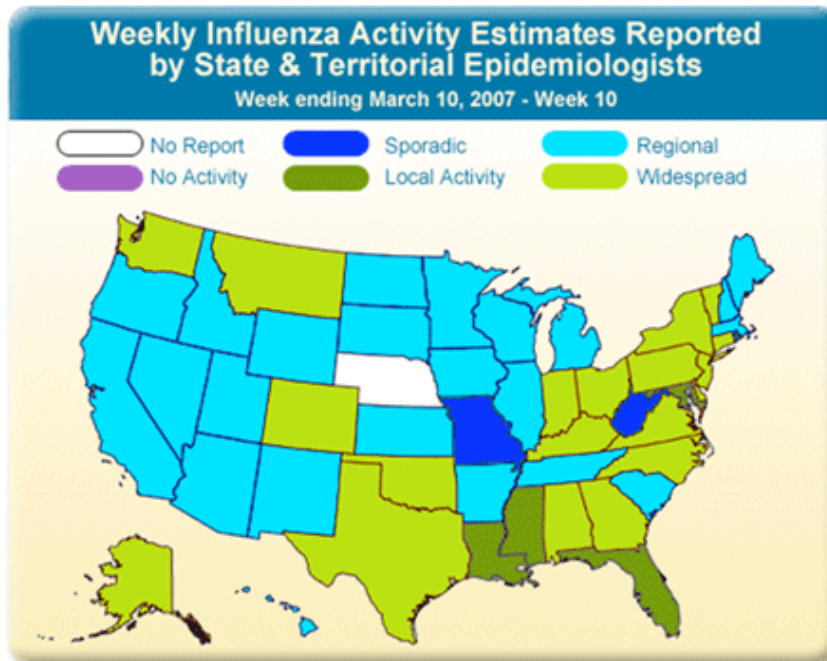
U.S. EPIDEMIOLOGY

Low levels of flu activity were reported in the United States during October through early December. Flu activity increased from mid-December through the end of the year, declined slightly in early January, and then increased again in mid-January.

During week 10 (ending 10 March 2007) of the current influenza season, the following influenza activity was reported by state and territorial epidemiologists:

- Widespread activity was reported by 19 states (Alabama, Alaska, Colorado, Connecticut, Delaware, Georgia, Indiana, Kentucky, Montana, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Texas, Vermont, Virginia, and Washington).
- Regional activity was reported by 23 states (Arizona, Arkansas, California, Hawaii, Idaho, Illinois, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Nevada, New Hampshire, New Mexico, North Dakota, Oregon, South Carolina, South Dakota, Tennessee, Utah, Wisconsin, and Wyoming).
- Local activity was reported by New York City, the District of Columbia, and four states (Florida, Louisiana, Maryland, and Mississippi).
- Sporadic activity was reported by three states (Missouri, Rhode Island, and West Virginia).
- No report was received from Nebraska.

To present these data in graphic form:



It should be noted that these categories (local, regional, widespread, etc) are less than adequately informed by specific incidence rates. The current definitions are based on reported Influenza-Like Illness (ILI) cases:

- No Activity: No laboratory-confirmed cases of influenza and no reported increase in the number of cases of ILI.

RECOMMEND TO A COLLEAGUE

NEWSLETTER ARCHIVE

- Sporadic: Small numbers of laboratory-confirmed influenza cases or a single laboratory-confirmed influenza outbreak has been reported, but there is no increase in cases of ILI.
- Local: Outbreaks of influenza or increases in ILI cases and recent laboratory-confirmed influenza in a single region of the state.
- Regional: Outbreaks of influenza or increases in ILI and recent laboratory confirmed influenza in at least 2 but less than half the regions of the state.
- Widespread: Outbreaks of influenza or increases in ILI cases and recent laboratory-confirmed influenza in at least half the regions of the state.

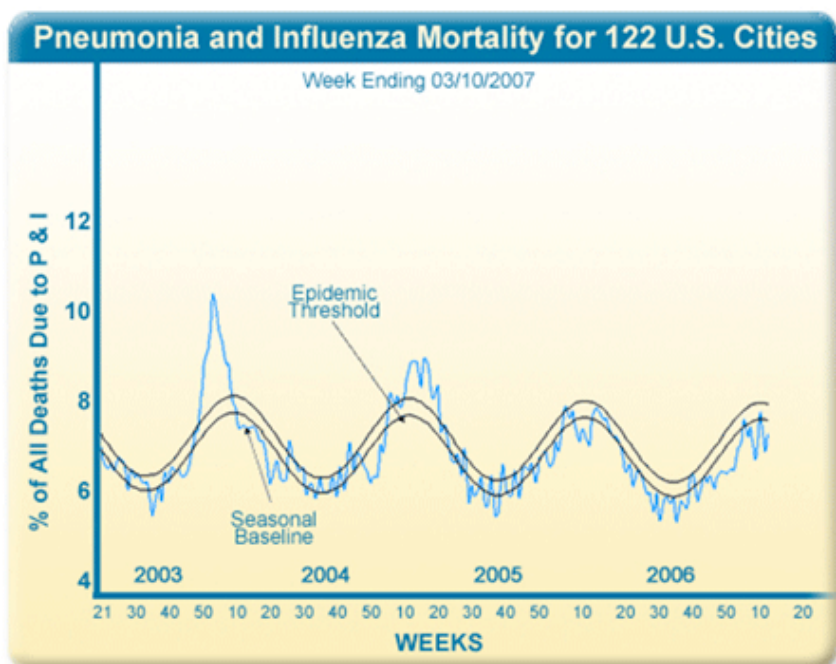
Although updated a few years ago with input from the Council of State and Territorial Epidemiologists (CSTE), these definitions are widely recognized as the weakest part of the national influenza surveillance system. Last fall, the CDC convened a workgroup to begin discussing and updating these category definitions.

SEVERITY

The overall severity of a flu season (measured by infections, hospitalizations and deaths) is determined by comparing the following criteria against measurements taken during previous seasons:

- The number of states that are affected by flu and the degree to which they are affected;
- The proportion of laboratory tests that are positive for flu;
- The proportion of all deaths that are caused by pneumonia and flu;
- The number of flu-associated deaths among children;
- The rate of flu hospitalization for children.

One of the key elements in determining the proportion of deaths caused by pneumonia and flu is the P & I, or Pneumonia & Influenza Mortality Surveillance. Based on death certificates with the cause of death listed as either pneumonia or influenza, these data are reported by local and state health departments.



RECOMMEND TO
A COLLEAGUE

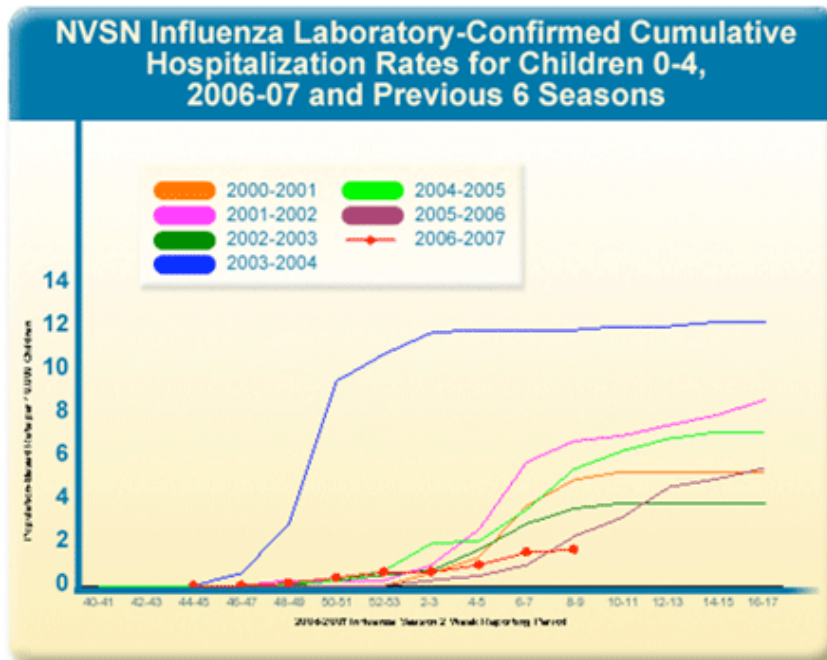
NEWSLETTER
ARCHIVE

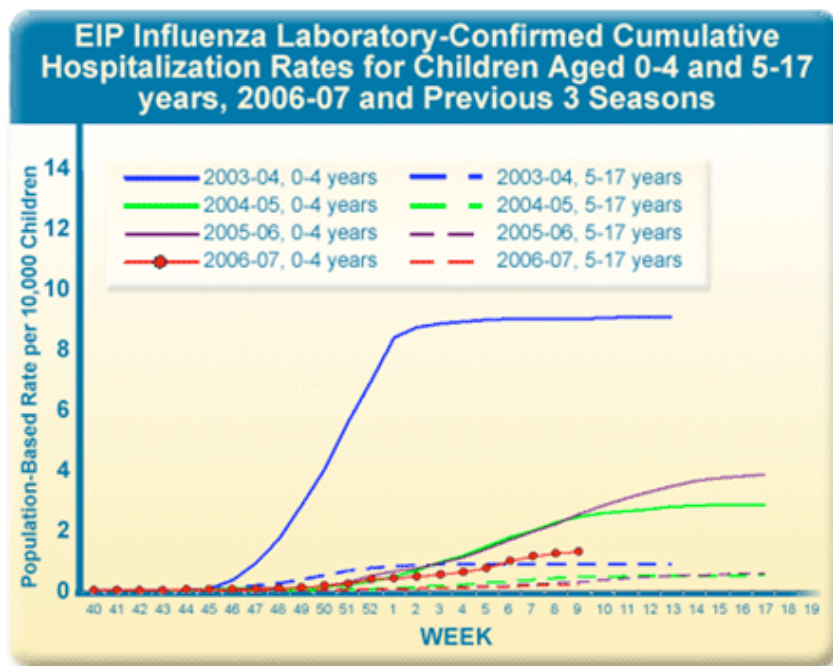
The graphic shows flu-related mortality for the past several years, with reference to a normal seasonal baseline (reflecting the fact that there are increased deaths that normally occur during the winter due to a variety of viruses other than influenza) and to a threshold above which the percentage of deaths would be considered epidemic. As can readily be seen, compared to previous years (particularly the 2003/2004 season), this current flu season thus far appears to be relatively mild.

Specifically, during week 10, 7.2% of all deaths were reported as due to pneumonia or influenza, a percentage below the epidemic threshold of 7.9%.

Children are one of the primary risk groups for influenza and its complications, and the CDC collects specific data on influenza-associated pediatric hospitalizations and mortality. Laboratory-confirmed influenza-associated pediatric hospitalizations are monitored by two population-based surveillance networks: the Emerging Infections Program (EIP) and the New Vaccine Surveillance Network (NVSN). During October 1, 2006 – March 3, 2007, the EIP reported the preliminary laboratory-confirmed influenza-associated hospitalization rate for children aged 0-4 years as 1.27 per 10,000; for children aged 5-17 years, the rate was 0.18 per 10,000. The NVSN reported that during November 5, 2006 – March 3, 2007, the preliminary laboratory-confirmed influenza-associated hospitalization rate for children aged 0-4 years old was 1.62 per 10,000.

These data, with comparisons to recent flu seasons, are represented graphically as:





Regarding pediatric mortality, the CDC shows that 7 influenza-associated pediatric deaths were reported during week 10. Since October 1, 2006, the CDC has received 32 reports of influenza-associated pediatric deaths that have occurred during the 2006/2007 season. Unfortunately, more flu-associated deaths may occur among children as the season progresses; however, at this time, neither childhood deaths nor hospitalizations are greater than expected for this point in the season.

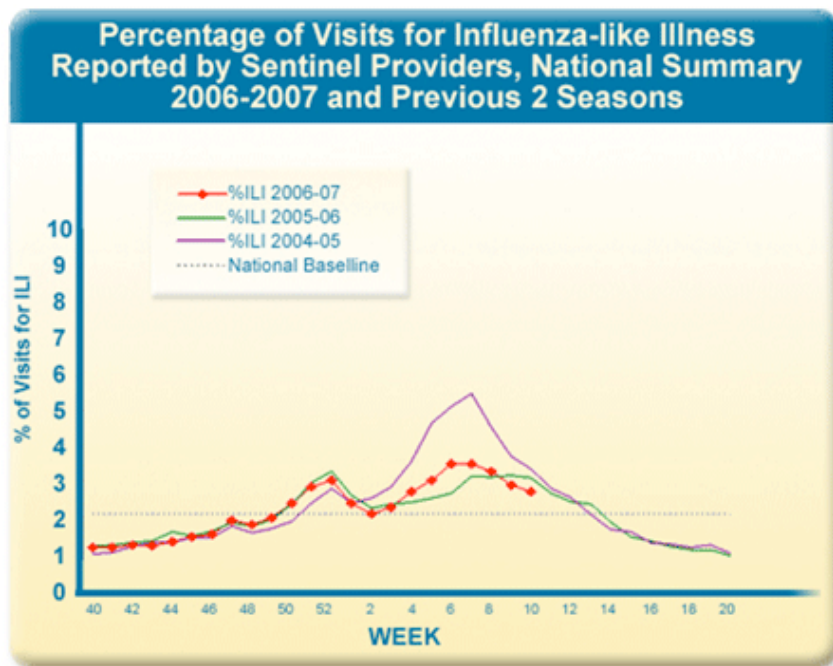
In comparison to previous years:

- During the 2005/2006 season, 44 flu-associated deaths in children under age 18 were reported to CDC.
- During the 2004/2005 season, 48 flu-associated deaths in children were reported.
- During the 2003/2004 season, 153 flu-associated deaths in children were reported.

An additional form of surveillance used to determine the severity of a flu season is the Sentinel Provider Network, where state and local health departments ask various health-care providers (particularly physicians in general practice) to voluntarily report the number of Influenza-Like Illnesses (ILI) they are seeing in their practices. This network of family physicians and internists, etc are most likely the first to diagnose influenza in their patients, and their data – reflecting those cases that normally do not require hospitalization – both add to the CDC's ability to provide an overall picture of flu activity, and also serve as an "early warning system" to make health care providers (including hospital-based physicians and public health officials) aware of increasing influenza outbreaks in their local communities.

During week 10 of the 2006/2007 influenza season, 2.7% of patient visits to U.S. Sentinel Providers were due to ILI, above the national baseline of 2.1%.

Presented graphically, the data for this and the previous 2 influenza seasons is as follows:



COMPOSITION OF THE 2007/2008 INFLUENZA VACCINE

Based on antigenic analyses of recently isolated influenza viruses, epidemiologic data, and post-vaccination serologic studies in humans, WHO has recommended that the 2007/2008 trivalent influenza vaccine for the Northern Hemisphere contain the following:

- A/Solomon Islands/3/2006-like (H1N1) - a recent antigenic variant of the current vaccine strain A/New Caledonia/20/99.
- A/Wisconsin/67/2005-like (H3N2).
- B/Malaysia/2506/2004-like viruses (antigenically equivalent to B/Ohio/1/2005).

The influenza A (H1N1) component has been changed from the 2006/2007 season vaccine components, while the influenza A (H3N2) and influenza B components remain the same.

VACCINE & ANTIVIRALS

Although vaccine production was adequate for this influenza season, there were distribution problems in the fall of 2006 that resulted in shortages and late deliveries to many clinics and private practices. Although the CDC does not take an active role in vaccine distribution, physicians, particularly those in private practice, are urged to place their vaccine orders early on, and to secure alternative sources should these distribution problems recur as the 2007/2008 season approaches.

Regarding antivirals: While no direct studies have been published reporting on the efficacy of the neuraminidase inhibitors this season, the CDC reports that the H1N1 samples tested in their labs have shown no developing resistance to these agents. Historically, H1N1 isolates have remained sensitive to the M2 inhibitors (amantadine/rimantadine). Further, in a [recent study in Japan](#) reported in the NEJM (Letter to the Editor, 18 January 2007), none of 61 isolates of H1N1 were resistant to the adamantanes, in contrast to 65% of the H3N2 isolates. However, the CDC continues to recommend that adamantanes not be used for treatment or prophylaxis of seasonal flu, because of resistance in both influenza A H3N2 and

RECOMMEND TO
A COLLEAGUE

NEWSLETTER
ARCHIVE

RECOMMEND TO
A COLLEAGUE

NEWSLETTER
ARCHIVE

SUMMARY

The CDC's Influenza Branch cross-references a variety of data sources to provide a continually evolving picture of influenza activity in this country. During week 10 (March 4 – March 10, 2007), influenza activity continued to decrease, declining for the fourth consecutive week. While ILI data was above baseline for the twelfth week this season, it too is declining, and the percent of deaths due to pneumonia and influenza remained below baseline level.

The current influenza season appears to be relatively mild, due to both a prevalence of the less severe H1N1 strain (versus H3N2) and a superior match to the components of the 2006/2007 vaccine. Further, influenza-associated morbidity and mortality are within (or below) expectations for this point in the season.

Further information, as well as future weekly updates, may be accessed via the CDC's website at: [CDC's website](#).

CME/CNE INFORMATION

Accreditation Statement — [back to top](#)

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing. The Johns Hopkins University School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

The Institute for Johns Hopkins Nursing is accredited as a provider of continuing nursing education by the American Nursing Credentialing Center's Commission on Accreditation.

Credit Designations — [back to top](#)

Physicians

The Johns Hopkins University School of Medicine designates this educational activity for a maximum of 1.0 *AMA PRA Category 1 Credit(s)*TM. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Nurses

This 1.2 contact hour Educational Activity (Provider Directed/Learner Paced) is provided by The Institute for Johns Hopkins Nursing. Each Newsletter carries a maximum of 1.2 contact hours or a total of 7.2 contact hours for the six newsletters in this program.

Pharmacists



This program is approved for two hour credit (0.2 CEUs) and is co-sponsored by the University of Tennessee College of Pharmacy who is approved by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education. A statement of CE credit will be mailed within 4 weeks of successful completion and evaluation of the program. ACPE Program #064-999-06-274-H01.

Grievance Policy: A participant, sponsor, faculty member or other individual wanting to file a grievance with respect to any aspect of a program sponsored or co-sponsored by the UTCOP may contact the Associate Dean for Continuing Education in writing. The grievance will be reviewed and a response will be returned within 45 days of receiving the written statement. If not satisfied, an appeal to the Dean of the College of Pharmacy can be made for a second level of review.

Post-Test — [back to top](#)

To take the post-test for influenza Review you will need to visit [The Johns Hopkins University School of Medicine's CME website](#) or [The Institute for Johns Hopkins Nursing](#). If you have already registered for another Hopkins CME program at these sites, simply enter the requested information when prompted. Otherwise, complete the registration form to begin the testing process. A passing grade of 70% or higher on the post test/evaluation is required to receive CME/CNE credit.

Statement of Responsibility — [back to top](#)

The Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing take responsibility for the content, quality, and scientific integrity of this CME/CNE activity.

Target Audience — [back to top](#)

RECOMMEND TO
A COLLEAGUE

NEWSLETTER
ARCHIVE

COMPLETE THE POST TEST

Step 1.

Click on the appropriate link below. This will take you to the post-test.

Step 2.

If you have participated in a Johns Hopkins on-line course, login. Otherwise, please register.

Step 3.

Complete the post-test and course evaluation.

Step 4.

Print out your certificate.

PHYSICIAN
POST-TEST

NURSE
POST-TEST

Pharmacy credit is only available via PDF mail-in form:

PHARMACY
POST-TEST

This activity has been developed for the Primary Care Physician, Internist, Infectious Disease Specialists and Nurse. There are no fees or prerequisites for this activity.

Learning Objectives — [back to top](#)

The Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing take responsibility for the content, quality, and the scientific integrity of this CE activity.

At the conclusion of this activity, participants should be able to:

- Identify the primary influenza viruses currently circulating in the US
- Compare the primary circulating influenza viruses with the 2006/2007 influenza vaccine components
- Discuss the reported morbidity and mortality attributed to influenza thus far this season

Internet CME/CNE Policy — [back to top](#)

The Offices of Continuing Education (CE) at The Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing are committed to protect the privacy of its members and customers. The Johns Hopkins University maintains its Internet site as an information resource and service for physicians, other health professionals and the public.

The Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing will keep your personal and credit information confidential when you participate in a CE Internet based program. Your information will never be given to anyone outside The Johns Hopkins University program. CE collects only the information necessary to provide you with the service you request.

Faculty Disclosure — [back to top](#)

It is the policy of The Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing that the faculty and provider disclose real or apparent conflicts of interest relating to the topics of this educational activity, and also disclose discussions of unlabeled/unapproved uses of drugs or devices during their presentation(s). Johns Hopkins School of Medicine OCME and The Institute for Johns Hopkins Nursing has established policies in place that will identify and resolve all conflicts of interest prior to this educational activity. Detailed disclosures will be made in the course handout materials.

The presenting faculty reported the following:

- John G. Bartlett, MD, has disclosed that he has served on the HIV Advisory Board for Glaxo Smith Kline, Abbott and Bristol-Myers Squibb.
- Jason E. Farley, PhD(c), MPH, NP has disclosed that he has no relationship with commercial supporters.

Disclaimer Statement — [back to top](#)

The opinions and recommendations expressed by faculty and other experts whose input is included in this program are their own. This enduring material is produced for educational purposes only. Use of Johns Hopkins University School of Medicine name implies review of educational format design and approach. Please review the complete prescribing information of specific drugs or combination of drugs, including indications, contraindications, warnings and adverse effects before administering pharmacologic therapy to patients.

Copyright
© JHUSOM, IJHN, and *eInfluenza Review*

Created by [DKBmed](#).

Johns Hopkins University School of Medicine CME/CNE Office
720 Rutland Avenue, Baltimore, MD 21205-2196