Clinical Insights® in
PEDIATRIC RESPIRATORY CARE
VOLUME 3, NUMBER 12 • DECEMBER 2007

Release Date: December 2007
Valid Through: February 2008

This educational activity is conducted as a part of the *Pediatric Respiratory Care Initiative*™ (PRCI ®), sponsored by Professional Postgraduate Services® (PPS).

Participants who wish to receive CME credit for this educational activity should do the following: (1) read the current issue; (2) complete the post-test and evaluation form. To apply for CME credit, you may complete the post-test and evaluation form on our website, www.PediatricRespiratory.org and click "Clinical Insights." You may also return the completed post-test and evaluation form via fax to 1 (201) 430-1441 or via mail to:

Professional Postgraduate Services®
CME Dept. T314
150 Meadowlands Parkway
Secaucus, NJ 07094-2304

If you have any questions, please call 1 (800) 606-6106 Ext. 8892.

Applicants will receive a certificate of participation from PPS by return mail within 6 to 8 weeks of the date of receipt of the completed evaluation form and post-test.

Learning Objectives

After studying the literature presented in this issue, participants should be able to:

- Outline the strategies for prioritization of pandemic influenza vaccine in 27 countries of the European Union (EU) and the Global Health Security Action Group
- Describe the human cases of H5N1 avian influenza and the prevention of its worldwide infections

Target Audience

This educational activity is designed for pediatricians, primary care physicians, pediatric and family nurse practitioners, neonatologists, infectious disease specialists, allergists, pulmonologists, immunologists, and other healthcare professionals involved in the care and management of pediatric respiratory patients.

Professional Postgraduate Services® is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

Professional Postgraduate Services® designates this educational activity for a maximum of 0.50 *AMA PRA Category 1 Credit*™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

This CME activity is supported by an educational grant from MedImmune, Inc.

Clinical Insights, Pediatric Respiratory Care Initiative, and PRCI are trademarks used herein under license.

Off-Label Disclosure

Some of the drug treatments discussed in this issue may note uses not approved by the Food and Drug Administration. Articles containing such uses will be noted at the end of the article.

Professional Postgraduate Services® is a business unit of KnowledgePoint360 Group, LLC, Secaucus, NJ.

PEDRO A. PIEDRA, MD,* EDITOR-IN-CHIEF; CAROLINE B. HALL, MD,† REVIEWER; KATHLEEN M. MAJOR,‡ SENIOR MANAGING EDITOR; CHING-LING C. CHEN, PhD,§ MEDICAL WRITER

Pandemic Influenza Vaccine Prioritization Strategies in 27 Countries of the European Union and the Global Health Security Action Group

Pandemic vaccine production can only start once the pandemic virus has been recognized. It is expected that pandemic vaccine capacity will be limited at least during the first phase of the pandemic. The distribution of limited and progressively available vaccine supply will therefore require strategies for vaccine prioritization to identify which group(s) of people shall receive the pandemic vaccine first. Vaccine prioritization may be quite different for each country because of vaccine availability and the resources for administration of vaccine, as well as the population structure and the organization of essential services. In 2005, the World Health Organization (WHO) encouraged its member states to develop or update their national influenza pandemic preparedness plans.

Straetemans and colleagues provided an overview of pandemic vaccine prioritization strategies in the 27 European Union (EU) member states and the four non-EU countries (Canada, Japan, Mexico, and the United States) of the Global Health Security Action Group. Data were collected for each country between September and December 2006 through the following two sources: the national influenza pandemic plan and by contacting the key person involved in pandemic planning by email and/or phone and/or fax.

Among the 31 countries studied, except for Belgium, Latvia, Luxembourg, Mexico, and Portugal 26 countries (84%) had established at least one vaccine priority group. Most of the reported vaccine priority groups could be assigned to these four main categories, which were similar to those in the guidelines provided by WHO: health care workers (HCW), essential service providers (ESP), high-risk individuals (HRI), and healthy adults and children. The most commonly reported vaccine priority groups were HCW (100%), ESP (92%), and HRI (92%); HCW was included as a vaccine priority group in all 26 countries, and ESP and HRI were included by 24 (92%) of 26 countries. Healthy adults and children were also included as one or two vaccine priority groups by 13 countries (50%).

Ranking of at least one vaccine priority group was reported by 17 (65%) of 26 countries. Fifteen (88%) of these 17 countries indicated that HCW who were in close contact with influenza patients should be vaccinated first. In most countries HCW were followed and/or ranked equally with ESP, and subsequently with HRI.

Rationales for prioritization were provided by 22 (85%) of 26 countries that established vaccine priority groups. There was a large variation in the phrasing and level of detailed specification of rationales. The rationales could be grouped into these four categories, which were also compatible with the guidelines from WHO: (1) to reduce morbidity and mortality, (2) to maintain infrastructure, (3) to limit social disruption, and (4) to limit economic losses. Seven (32%) of 22 countries providing rationales clearly associated each vaccine priority group with the specific rationale.

In most countries coordination of pandemic preparedness falls under the responsibility of the Ministry of Health; however, experts or advisory committees for vaccination frequently advised

Continued

Disclosures:

* Dr Piedra is professor of pediatrics and molecular virology and microbiology at Baylor College of Medicine. He has indicated relevant financial relationships as noted: he receives grant/research support from MedImmune, Inc. and sanofi pasteur; he is a member of the speakers bureau for MedImmune, Inc.; he is an expert witness for sanofi pasteur; he is an ad hoc consultant for MedImmune, Inc., sanofi pasteur, GlaxoSmithKline, Novartis, and Roche; and he is part of a collaborative research agreement with NIH and Baylor.

† Dr Hall indicated that she receives grant/research support from MedImmune, Inc.

‡ Ms Major is a senior managing editor for Professional Postgraduate Services®. She has indicated no relevant financial relationships.

§ Dr Chen is a medical writer for Professional Postgraduate Services®. She has indicated no relevant financial relationships.

Terri Setteducato is a senior program director, Wadee'ah Terry is a CME program manager for Professional Postgraduate Services®. They have indicated no relevant financial relationships.

PRCI MISSION STATEMENT

The PRCI is a multicomponent educational program on pediatric respiratory disorders designed for pediatricians, primary care physicians, pediatric and family nurse practitioners, neonatologists, infectious disease specialists, allergists, pulmonologists, immunologists, and other healthcare professionals involved in the care and management of pediatric respiratory patients. PRCI programs address issues concerning asthma, respiratory syncytial virus, and other respiratory tract infections and disorders. Methods to prevent, control, and treat respiratory illnesses in children are also evaluated.

(Continued)

the government during the development of pandemic preparedness plans. Ten countries (32% of the 31 studied) have consulted and involved ethical experts to guide decisions related to vaccine prioritization.

Straetemans et al concluded that the establishment of vaccine priority groups, priority ranking, and rationales are in good agreement with the guidelines recommended by WHO in the majority of countries studied. An area that needs to be better addressed is the discrepancy involving the low priority given to the vaccination of children, following published results from mathematical modeling that favors prioritization of children for the reduction of transmission. The authors addressed challenges in the prioritization of pandemic vaccines, such as public acceptability and the identification and vaccine administration of prioritized individuals. They also suggested that the goals of prioritization need to be stated clearly and the criteria should be linked with the groups that are to be prioritized. Furthermore, ethical experts and results of modeling exercises could play an increasingly important role in the future decision-making process of pandemic vaccine prioritization.

Straetemans M, Buchholz U, Reiter S, Haas W, Kraus G. Prioritization strategies for pandemic influenza vaccine in 27 countries of the European Union and the Global Health Security Action Group: a review. *BMC Public Health*. 2007;7:236.

COMMENTARY

CAROLINE B. HALL, MD, Professor of Pediatrics and Medicine, Pediatric Infectious Diseases, University of Rochester School of Medicine and Dentistry, Rochester, New York.

This detailed summary of the plans for a pandemic influenza vaccine, which was formulated by 27 nations, is striking in its variability regarding the priorities among the different countries, irrespective of their location, size, or resources. The implications of this are within the article's overall message—the need for good communication within each country and among countries. The report emphasizes that the communication structure and strategy must be in place prior to a pandemic, when it is needed. Concurrent with this is the need to educate the public about the priorities for vaccine use, with the goal of both acceptance and adherence during the emergent situation of a pandemic.

But what is not addressed is if and how this important communicative infrastructure should be adequately pretested. In the time of crisis and public panic, the expected means of communication may become overloaded and fragmented, with word of mouth and rumors supervening. The result will be the sudden influx of people demanding vaccine for facilities caring for outpatients. Although this situation cannot be truly mimicked for prepandemic drills, education and resources for these outpatient facilities could be emphasized. Yet only seven countries specifically listed personnel of outpatient facilities as a top priority regarding healthcare workers who should be vaccinated.

This article's importance is not only documenting the variability of the recommendations and priorities among countries of diverse cultures, histories, and economic standing, but perhaps even more important is these findings demonstrate that no scientific standard exists or is possible for determining the relative value of priorities in the healthcare of different individuals. The conclusion, therefore, could be that the top priority in plans for a pandemic flu is to immediately increase the proportion of our population who are immunized with the currently available vaccines. Each year the sudden rise in influenza cases may be followed by concerns of a pandemic strain, but most will turn out to be strains similar to those contained in the annually recommended vaccines. Furthermore, preparedness for a pandemic strain may be enhanced by the current seasonal trivalent influenza vaccines because they may offer some cross protection against new, potentially avian, strains,[1] and live attenuated vac- may provide broader and longer lasting immunity.[2]

1. Ichinohe T, Tamura S, Kawaguchi A, et al. *J Infect Dis*. 2007;196:1313-1320.
2. Belshe RB, Edwards KM, Vesikari T, et al. *N Engl J Med*. 2007;356:685-696.

Human Cases of H5N1 Avian Influenza and the Threat of the Next Human Pandemic

Avian influenza H5N1 has caused hundreds of severe human infections in the Eastern hemisphere since the end of the year 2003. The recent outbreaks have increased global concerns about the possibility of another human influenza pandemic.

Among the three types of influenza virus, only influenza A has demonstrated the capability of causing pandemics. As described by Nguyen-Van-Tam and Sellwood, influenza A has caused the following three well-documented pandemics in the 20th century: 1918-1919 (subtype A/H1N1), 1957-1958 (A/H2N2), and 1968-1969 (A/H3N2), with a worldwide mortality estimated at 40 to 50 million in 1918-1919 and 1 million in both 1957-1958 and 1968-1969.

Avian influenza A/H5N1 has recently infected and killed poultry and wild waterfowl in South Asia, parts of Africa, and Eastern Europe. The first human case associated with H5N1 avian influenza was reported in Vietnam in December 2003. An estimated 224 human cases of H5N1

Human Cases of H5N1 Avian Influenza

avian influenza and 127 fatalities had been reported by the World Health Organization (WHO) before June 2006.

To better prepare for the control of H5N1 infections, Chen and colleagues conducted a survey of human cases caused by H5N1 avian influenza. Their results indicated that human infections with this virus have escalated in the past 3 years. Although four cases from Vietnam and seven cases from Indonesia were suspected to be from human-to-human transmission, the majority of the infections were linked to close contact with diseased or dead fowl or the exposure to an environment with diseased or dead fowl. Additionally, 70 cases were linked with exposure to an environment with diseased or dead backyard fowl. Chen and colleagues thus suggest that control of the H5N1 influenza infection caused by fowl depends on avoidance of high-risk behaviors, such as contact with diseased or dead fowl and the proper disposal of diseased or dead fowl, which is vital to the prevention of human infection with avian influenza viruses. Furthermore, a ban on keeping backyard fowl, which greatly facilitate the circulation and transmission of the avian influenza viruses, should be considered.

The age distribution of these 224 human H5N1 cases indicate that children and young adults are more susceptible to H5N1 avian influenza infection (45 cases [26%] involved patients 0 to 9 years of age and 47 cases [23%] involved patients 10 to 18 years of age). People ≥45 years of age are more immune to the infection (8 cases [5%]), possibly because older people are more likely to have been infected at least once in their lives with a human influenza A virus. Chen and colleagues hypothesized that live attenuated influenza vaccines, which are efficacious against human influenza, can probably induce cross-protective cellular immunity against the H5N1 avian influenza virus. The effectiveness of live attenuated seasonal influenza vaccines in preventing avian influenza infections in humans must be investigated.

Nguyen-Van-Tam and Sellwood also described strategies to prepare for the next pandemic. The UK pandemic contingency plan considers a broad range of approaches, including antivirals, nonpharmaceutical interventions such as hand washing, voluntary isolation of cases, effective handling of contacts, and limiting both nonessential travel and mass gatherings of people to minimize the impact of the pandemic. Nevertheless, the main defense against pandemic influenza is a vaccine matched to the pandemic strain, which might require 4 to 6 months for development. The neuraminidase inhibitor antivirals, oseltamivir and zanamivir, have been recommended for use within the first 48 hours of being infected to mitigate the impact of the virus. In addition, interventions to reduce local transmission of influenza, such as school closures, might reduce clinical peak attack rates in children by up to 40%. New preventive planning should continue to develop and be modified for the control of H5N1 avian influenza epidemics, which may evolve to produce the next pandemic.

Nguyen-Van-Tam JS, Sellwood C. Avian influenza and the threat of the next human pandemic. *J Hospital Infection*. 2007;65(52):10-13.

Chen J-M, Chen J-W, Dai J-J, Sun Y-X. A survey of human cases of H5N1 avian influenza reported by the WHO before June 2006 for infection control. *Am J Infect Control*. 2007;35:351-353.

Clinical Insights® in Pediatric Respiratory Care
Post-Test (December 2007)

1. Among the countries in the European Union and the Global Health Security Action Group that were included in the study of pandemic influenza vaccine prioritization, how many countries had established at least one vaccine priority group?
   a. 31
   b. 26
   c. 17
   d. 22
   e. None of the above

2. Regarding the human cases of H5N1 avian influenza reported by the WHO before June 2006, which age group of people is more immune to the infection?
   a. 0 to 9 years of age
   b. 10 to 18 years of age
   c. 19 to 27 years of age
   d. 28 to 36 years of age
   e. ≥45 years of age

1. *b*. Among 31 countries included in the study, except for Belgium, Latvia, Luxembourg, Mexico, and Portugal 26 countries (84%) had established at least one vaccine priority group.
2. *e*. People ≥45 years of age are more immune to the infection, possibly because older people are more likely to have been infected at least once in their lives with a human influenza A virus.

For more information about upcoming PRCI® CME activities, visit us at **www.PediatricRespiratory.org.**

EM-T314-12-PHYCME-1207-29K

prci® Pediatric Respiratory Care Initiative™

Activity Code: T314-12
Issue Date: December 2007
Valid through: February 2008

CME Activity Evaluation/Registration Form

Participants who wish to obtain CME credit, please complete the contact information below, sign this form, and fax it with the completed post-test to 1 (201) 430-1441 or mail to PPS, CME Dept. T314, 150 Meadowlands Parkway, Secaucus, NJ 07094-2304. You may download previous issues of *Clinical Insights® in Pediatric Respiratory Care* e-newsletters by visiting us online at www.PediatricRespiratory.org.

I completed this activity as designed: ______________________________ *(Signature)* ______________ *(Date)*

PLEASE PRINT CLEARLY:

☐ Dr ☐ Mr ☐ Mrs ☐ Ms ☐ Prof Other *(Please specify)* ____________

First Name

Last Name

Degree ☐ MD ☐ PharmD ☐ DO ☐ NP ☐ PA ☐ RPh ☐ Other *(Please specify)* ____________

Specialty ☐ Family Practice ☐ Pediatrics ☐ General Practice ☐ Neonatal ☐ Other ____________

Profession

PREFERRED MAILING ADDRESS ☐ Home ☐ Office ☐ Practice ☐ Academic

Dept/Div/Suite/Unit/Affil

Street

City/State/ZIP Code Country

Email

(Please print clearly)

Phone: - - Fax: - -

Clinical Insights® in Pediatric Respiratory Care is available to you via email. If you would like to receive future issues via email, please check here ☐ .

Overall Program

	Strongly Disagree		Disagree	Agree		Strongly Agree
1. The activity met the stated objectives in such a way that I am better able to:						
a. Outline the strategies for prioritization of pandemic influenza vaccine in 27 countries of the European Union (EU) and the Global Health Action Group	1	2	3	4	5	6
b. Describe the human cases of H5N1 avian influenza and the prevention of its worldwide infections	1	2	3	4	5	6

2. Overall, the activity was presented in a fair-balanced manner. ☐ Yes ☐ No*

 * If you checked "No," please explain. ____________________

3. Overall, the activity was free of commercial bias. ☐ Yes ☐ No*

 * If you checked "No," please explain. ____________________

4. In reflecting on your practice, what type of impact will this educational activity have?

 ☐ Understand the concepts of pandemic influenza vaccine prioritization and identify which group(s) of people shall receive the pandemic vaccine first.

 ☐ Recognize the H5N1 avian influenza infections in humans and the strategies for the prevention of the potential human influenza pandemic.

 I will:

 ☐ Recommend influenza vaccine prioritization to healthcare workers, essential service providers, and individuals with a high risk of death and severe complication.

 ☐ Raise awareness of the susceptibility to H5N1 avian influenza infections in children and young adults.

5. What topics should be dealt with in more detail? (*List topics.*)

 ____________________ ____________________

 ____________________ ____________________

Thank you for your participation.