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

- Describe the knowledge and attitudes regarding influenza vaccination among hospital health workers caring for pregnant women and healthy young children.
- Assess progress in influenza vaccination among recommended populations in the United States from 1989 to 2005, as well as the racial/ethnic disparities in vaccination coverage.

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.

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Editor's Note: Influenza affects the entire family, not just children or adults. This month's featured articles go hand in hand in dealing with a major barrier of children not getting vaccinated: the attitudes of adults and their healthcare providers. In addition, vaccination of pregnant women and those aged 18 to 64 years living with high-risk household members—the "family package"—ensures the protection of infants and young children against influenza.

Knowledge and Attitudes Toward Influenza Vaccination Among Healthcare Workers for Pregnant Women and Young Children

In the United States, the Advisory Committee on Immunization Practices (ACIP) recommends annual influenza vaccination of pregnant women at any stage of pregnancy and all infants and children aged 6 to 59 months. The Italian Ministry of Health also recommends influenza vaccination for pregnant women, children with chronic severe diseases, and healthcare workers (HCWs). The use of the influenza vaccine during pregnancy and in young children depends largely on the perceptions and recommendations of obstetricians/gynecologists (OB/GYNs), neonatologists, and pediatricians. The present study assessed the knowledge and attitudes regarding influenza vaccination among HCWs in these 3 specialties in Italy's largest Department for the Health of Women and Children, and evaluated the compliance with national guidelines and the possibility to adopt recommendations established by the US ACIP.

Esposito and colleagues conducted a cross-sectional study, which included 340 physicians, nurses, and paramedics working in obstetrics/gynecology, 123 working in neonatology, and 244 working in pediatric wards. Analysis of questionnaires completed by 707 (95.6%) of

the participants indicated that the majority of OB/GYNs never recommend influenza vaccination to their patients during pregnancy, and the majority of neonatologists and pediatricians recommend vaccination to young children only in the presence of high-risk chronic underlying diseases. The main reasons for the limited use of influenza vaccination in all 3 fields were doubts regarding the efficacy of vaccination and lack of data concerning influenza-related complications in pregnant women and healthy young children.

The majority of physicians, but only a minority of nurses and paramedics, considered influenza a potentially serious disease. Most HCWs were aware of the high risk of influenza-related complications among the elderly; however, only some were aware that school-aged children actually had the highest incidence of the disease. All HCWs were seriously deficient in general knowledge of influenza prevention. The poor knowledge of influenza prevention was further reflected by low levels of personal vaccination coverage among HCWs. Among those who underwent vaccination, very few indicated that the main reason for vaccination was to prevent transmitting the infection to their patients.

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Disclosures:

* Dr Piedra is professor of pediatrics and molecular virology and microbiology at Baylor College of Medicine, Houston, Texas. He has indicated that he receives grant/research support from MedImmune, Inc., Sanofi Pasteur, and Novartis Pharmaceuticals; is a speaker for MedImmune, Inc.; and is an ad hoc consultant for Hoffman-La Roche, Inc., MedImmune, Inc., and Novartis Pharmaceuticals.

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ACIP Update...

- On February 28, 2008, ACIP recommended that immunization providers should begin efforts to offer influenza vaccination to all infants and children aged 6 months through 18 years for the 2008-2009 influenza season, if feasible, consistent with the current recommendations that all persons who want to reduce the risk of becoming ill with influenza, or of transmitting influenza to others, should be vaccinated.
- Annual vaccination for all children aged 6 months through 18 years should begin in the 2009-2010 influenza season.

Meeting of the ACIP, Centers for Disease Control and Prevention, Atlanta, GA, February 27-28, 2008. Available at: <http://www.cdc.gov/vaccines/recs/acip/slides-feb08.html>. Accessed April 10, 2008.

Knowledge and Attitudes (Continued)

And, the main reason for not being vaccinated was the absence of fear of the disease.

The authors concluded that the low compliance with the current recommendations for pregnant women and healthy young children by HCWs was mostly associated with major deficiencies in their knowledge of influenza and its prevention. Extensive and sustained

efforts to reduce this gap are required among HCWs caring for pregnant women and children in order to ensure effective compliance with the current recommendations.

Esposito S, Tremolati E, Bellasio M, et al. Attitudes and knowledge regarding influenza vaccination among hospital health workers caring for women and children. *Vaccine*. 2007;25(29):5283-5289.

COMMENTARY

JAY M. LIEBERMAN, MD, PROFESSOR OF CLINICAL PEDIATRICS, UNIVERSITY OF CALIFORNIA, IRVINE.

Are you an optimist or a pessimist? The good news is that influenza vaccine coverage rates in the United States are improving. The bad news is that we are not close to where we need to be (coverage rates among healthcare workers remain appallingly inadequate). The greatest progress has been made in coverage among the elderly, who are at greatest risk of dying from influenza-related complications. What we have learned from other vaccines is that targeting high-risk individuals is rarely a successful strategy because most people who should get vaccinated do not. Routine immunization is far more effective, and regarding influenza vaccine we are moving toward a more comprehensive strategy that focuses on the young. The Advisory Committee on Immunization Practices (ACIP) recently recommended influenza vaccination for all school-aged children who are 5 to 18 years of age to take effect as soon as feasible, but no later than the 2009-2010 influenza season. Since young children have the highest incidence of infection and often serve as the focal point for influenza epidemics in the community, high vaccine coverage rates among school-aged children could benefit us all.

Increasing Influenza Vaccination Rates Will Lead to Better Protection of Those Most Vulnerable

Influenza is a major cause of morbidity and mortality among adults in the United States, especially among those 65 years of age and older. During the 1990-1999 influenza seasons, approximately 36,000 excess deaths were attributed annually to influenza, with more than 90% of deaths occurring in patients aged 65 years and older. Although the influenza vaccine has been proven to be efficacious and cost-effective in reducing influenza-associated morbidity and mortality in adults as well as children, the levels of vaccination are suboptimal. Influenza vaccination is recommended for persons at increased risk for influenza complications, including all persons aged 65 years and older, younger persons with chronic diseases (eg, diabetes, chronic heart conditions, chronic obstructive pulmonary disease), and women who will be pregnant during influenza season.

To assess influenza vaccination coverage

among recommended populations in the United States, Lu and colleagues conducted a study to analyze the data from the 1989-2005 National Health Interview Surveys. They evaluated self-reported influenza vaccination prevalence (ie, influenza vaccination in the past 12 months) among persons aged 65 years and older; younger individuals with high-risk conditions such as diabetes, chronic heart disease, and kidney failure; healthcare workers; pregnant women; and persons aged 18 to 64 years living in households with at least one identified person at high risk of influenza-associated complications, including all children 2 years of age or younger. High-risk child family members were identified based on age and high-risk conditions (all children <2 years of age, and children 2-17 years of age with high-risk conditions such as asthma, diabetes, congenital heart disease). Household contacts were defined as persons aged 18 to 64 years living in households

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Increasing Influenza (Continued)

with at least one identified person at high risk for influenza complications, including children <2 years of age. The authors evaluated trends in vaccination, and racial/ethnic disparities in influenza vaccination among target populations.

A total of 18,356 participants were included in the analysis in 2004: 22.4% were 50 to 64 years of age, 19.2% were 65 years of age and older, and 8.2% were healthcare workers. Among younger individuals aged 18 to 64 years, 18.7% reported having a high-risk condition.

The authors noted that influenza vaccination coverage among adults aged 65 years and older increased annually (test for trend, $P < 0.05$) from 1989 to 1999, and reached a plateau during 1999 through 2004 (test for trend, $P > 0.05$). Coverage for this age group increased from 30.1% (95% confidence interval [CI], 28.8-31.3) in 1989 to 70.0% (68.0-71.5) in 2004. National vaccination coverage levels among all recommended adult populations all peaked in 2004, then declined in 2005 because of the 2004-2005 vaccine shortage. In 2004, coverage was 40.7% (39.0-42.5) for individuals 50 to 64 years of age, 27.2% (24.6-29.9) for individuals aged 18 to 49 years with high-risk conditions, 43.2% (39.9-46.6) for healthcare workers, 21.1% (19.1-23.4) for individuals aged 18 to 64 years with household contacts, and 14.4% (8.8-22.9) for pregnant women. Persons with high-risk conditions had significantly higher influenza vaccination coverage compared with persons without high-risk conditions of the same age groups. The authors also

stratified data by race/ethnicity to identify possible disparities in influenza vaccination coverage. Among each of the recommended adult subgroups, vaccination coverage was significantly higher for non-Hispanic whites compared to minority groups.

Lu and associates concluded that the 2004 influenza vaccination coverage among adults aged 65 years and older had exceeded the national 2000 objective of 60%, but was well below the national 2010 target of 90% recommended by the Advisory Committee on Immunization Practice (ACIP). In addition, coverage levels for other target groups were also far short of the Healthy People 2000 and 2010 goals of 60% for individuals aged 18 to 64 years who are healthcare workers, pregnant, or those with high-risk conditions. Increasing vaccination rates among the recommended groups and among their household contacts would better protect individuals who are the most vulnerable to influenza complications, such as the elderly and young children. The authors suggested that efforts to increase public awareness, provider's knowledge for adult immunization, and ensuring a stable supply of vaccine are needed to improve annual influenza vaccination coverage among target populations, and to eliminate racial/ethnic disparities.

Lu P, Bridges CB, Euler GL, et al. Influenza vaccination of recommended adult populations, US, 1989-2005. *Vaccine*. 2008;26(14):1786-1793.

Post-Test

- Which of the following groups are at increased risk for influenza complications?
 - Persons aged 65 years and older
 - Children 2 to 17 years of age with high-risk conditions such as asthma, diabetes, or congenital heart disease
 - Children <2 years of age
 - Women who will be pregnant during influenza season
 - All of the above
- Based on the findings of the knowledge and attitudes regarding influenza vaccination among HCWs caring for pregnant women and young children, which of the following statements is **false**?
 - The majority of physicians in all 3 specializations considered influenza a potentially serious disease
 - Most HCWs were aware of the high risk of influenza-related complications among the elderly
 - The majority of nurses and paramedics considered influenza a potentially serious disease
 - Most OB/GYNs never recommended influenza vaccination to their patients during pregnancy
 - Personal vaccination coverage was low among all HCWs caring for pregnant women and young children

ANSWERS

Answer: c. Only a minority of nurses and paramedics considered influenza a potentially serious disease.
Answer: e. All of these groups are vulnerable to influenza complications.

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