



Arkansas Department of Health

4815 West Markham Street • Little Rock, Arkansas 72205-3867 • Telephone (501) 661-2000

Governor Mike Beebe

Paul K. Halverson, DrPH, FACHE, Director and State Health Officer

April 1, 2010

Influenza Update: Georgia is seeing a spike in swine flu [influenza pandemic (H1N1) virus infection] hospitalizations, having the most in the country for 3 weeks in a row, federal health officials said Monday [29 Mar 2010]. It is too early to say whether Georgia or the country is seeing another wave of the illness, which had diminished across the nation for several months, the officials said. Don't forget to test and report patients with influenza like symptoms (especially if hospitalized).

Invasive Pneumococcal Disease in Young Children Before Licensure of 13-Valent Pneumococcal Conjugate Vaccine - United States, 2007, *MMWR*, March 12, 2010 / 59(09); 253-257

Invasive pneumococcal disease (IPD), caused by *Streptococcus pneumoniae* (pneumococcus), remains a leading cause of serious illness in children and adults worldwide. After routine infant immunization with a 7-valent pneumococcal conjugate vaccine (PCV7) began in 2000, IPD among children aged <5 years in the United States decreased by 76%; however, IPD from non-PCV7 serotypes, particularly 19A, has increased. In February 2010, the Advisory Committee on Immunization Practices (ACIP) issued recommendations for use of a newly licensed 13-valent pneumococcal conjugate vaccine (PCV13). PCV13 contains the seven serotypes in PCV7 (4, 6B, 9V, 14, 18C, 19F, and 23F) and six additional serotypes (1, 3, 5, 6A, 7F, and 19A). To characterize the potentially vaccine-preventable IPD burden among children aged <5 years in the United States, CDC and investigators analyzed 2007 data from Active Bacterial Core surveillance (ABCs). This report summarizes the results of that analysis, which found that among 427 IPD cases with known serotype in children aged <5 years, 274 (64%) were caused by serotypes contained in PCV13. In 2007, an estimated 4,600 cases of IPD occurred in children in this age group in the United States, including approximately 2,900 cases caused by serotypes covered in PCV13 (versus 70 cases caused by PCV7 serotypes). PCV13 use has the potential to further reduce IPD in the United States. Post-licensure monitoring will help characterize the effectiveness of PCV13 in different populations and track the potential changes in disease burden caused by non-PCV13 serotypes.

Investigators reviewed medical records to identify children aged 24-59 months with underlying medical conditions who are recommended by ACIP to receive the 23-valent pneumococcal polysaccharide vaccine (PPSV23). Characteristics of these high-risk children and healthy children were compared by chi-square test; data from 2006 and 2007 were summed because of the small number of IPD cases with underlying medical conditions among persons in this age group.

In 2007, a total of 493 children aged <5 years (<60 months) with IPD were identified, and information on the serotype of the pneumococcal isolate was available for 427 (87%) of those children. Among the 427, the group aged <12 months accounted for 36% of all cases, and the 12--23 months group accounted for 29%. Overall rates were highest in children aged <12 months and 12-23 months (40.5 and 31.2 cases per 100,000 population, respectively); among children aged 24-59 months, rates of all IPD decreased with each additional year of age. Information on race was available for 378 (89%) cases for which serotype information was available. Among children aged <5 years, rates of overall IPD in black children (35.8 cases per 100,000) and children of other races (30.7 cases per 100,000) were approximately twofold and 1.7-fold higher, respectively, than rates for white children (18.4 per 100,000).

Among the 427 IPD cases with known serotype in children aged <5 years, 274 (64%) were caused by serotypes contained in PCV13. Of these 274 cases, 260 (95%) were caused by three of the six additional serotypes (3, 7F, and 19A) that are not included in PCV7; overall, 180 (42%) of the 427 were caused by serotype 19A. Within each 1-year age group, the proportions of all IPD cases caused by serotypes covered by PCV13 were relatively similar, ranging from 59% to 71%. The proportions of all IPD cases caused by the 13 serotypes were comparable in black children (61%), children of other races (62%), and white children (67%).

Information on hospitalization and clinical outcome was available for 99% of serotyped IPD cases. Among 272 children with IPD caused by serotypes covered by PCV13 for whom hospitalization status, clinical presentation, and outcome were known, 168 (62%) were hospitalized, and four (2%) died; 101 (37%) had bacteremia without confirmed source, 24 (9%) had meningitis, and 115 (42%) had pneumonia with bacteremia.

Based on the 2007 rate of IPD in children aged <5 years (22 cases per 100,000), an estimated 4,600 cases of IPD occurred in this age group in the United States. Included among those cases were an estimated 70 cases caused by serotypes covered in PCV7 and 2,900 cases caused by serotypes covered in PCV13.

During 2006-2007, a total of 301 IPD cases with a known serotype occurred among children aged 24-59 months; 31 cases (10%) occurred in a child at high risk recommended for vaccination with PPSV23. Of these 31 cases, the 11 serotypes included in PPSV23 but not in PCV13 accounted for four cases (13%), serotypes covered in PCV13 accounted for 13 cases (42%), and the remaining 14 cases (45%) were caused by serotypes not covered in either vaccine. PCV13 serotypes accounted for a smaller proportion of cases among children with underlying medical conditions than among healthy children aged 24--59 months (42% [13 of 31] versus 65% [175 of 270]; $p = 0.01$).

Routine infant immunization with PCV7 since 2000 has decreased rates of IPD in young children markedly, but IPD from non-PCV7 serotypes, predominantly serotype 19A, has increased and partially offset these reductions. Overall, rates of IPD have remained stable at 22-25 cases per 100,000 since 2002. Based on the findings in this report, the use of PCV13 in the routine immunization schedule has the potential to further reduce IPD caused by the six additional serotypes (1, 3, 5, 6A, 7F, or 19A) among children aged <5 years.

After PCV7 was introduced, rates of IPD caused by the seven serotypes covered in the vaccine also decreased substantially among unvaccinated children and adults. This indirect (or herd) effect resulted from reduced nasopharyngeal carriage of pneumococcus in vaccinated children and reduced transmission from children to unvaccinated children and adults. Immunization of children with PCV13 also is anticipated to have herd effects among adults. For example, as of 2007, serotype 19A had emerged as the most common cause of IPD in all age groups after PCV7 introduction (CDC, unpublished data, 2009). Colonization and disease caused by serotype 19A have a similar epidemiological pattern to those caused by PCV7 serotypes, and some degree of herd effects in the population might be expected. In contrast, some of the other new serotypes in PCV13 might have different epidemiologic characteristics. In particular, serotypes 1 and 5 are rarely found in the nasopharynx, so the potential herd effects of PCV13 vaccination on disease caused by these serotypes is uncertain. In the United States, however, serotypes 1 and 5 are relatively uncommon causes of IPD.