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### **Arizona Vaccine News**

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## **VACCINE NEWS**

### **Outbreak of *Neisseria meningitidis* serogroup B at Two Universities**

- Eight people who attend Princeton University or visited there have developed invasive disease due to *N. meningitidis* serogroup B between March and November 2013.
- Three students attending University of California, Santa Barbara (UCSB) have developed a different strain of invasive *N. meningitidis* serogroup B in November 2013.
- The meningococcal vaccines licensed in the United States only contain serogroups A, C, Y and W135, not serogroup B.
- There is a meningococcal serogroup B vaccine that is licensed for use in Europe and Australia. The Centers for Disease Control and Prevention (CDC) and the US Food and Drug Administration (FDA) will allow the use of this vaccine for the particular situation at Princeton under an Investigational New Drug protocol.
- The CDC has also sent out a [Heath Advisory Notice](#) for healthcare providers about recognizing and reporting cases.

For more information, see the State of New Jersey Department of Health [website](#), the Princeton University [website](#), the UCSB [website](#), the California Department of Health [website](#) or the CDC's [website](#).

### **FDA Approves H5N1 Avian Influenza Vaccine to Supplement National Stockpile**

- The FDA has approved a vaccine for the prevention of H5N1 avian influenza.
- The H5N1 avian influenza vaccine is not intended for commercial availability, but as part of the US National Stockpile for pandemic influenza preparedness. It would be distributed by public health officials if the H5N1 influenza were ever to become able to easily spread from person to person.
- Although H5N1 influenza has caused serious illness and death in people outside of the US, most of the infections have been among people who have been in close contact with H5N1-influenza infected poultry. However, when people do become infected with H5N1 influenza, about 60 percent die.
- The vaccine is made using an egg-based manufacturing process. It contains an adjuvant AS03, an oil-in-water emulsion which enhances the immune response to the vaccine.
- The FDA approval of this H5N1 influenza vaccine is for use in people 18 years of age and older who are at increased risk of exposure to the H5N1 influenza virus.

For more information, see the [FDA press release](#).

### **Measles in the United States, January 1-August 24, 2013**

- There have been 159 cases of measles this year in the US as of August 24, 2013.
  - 99% were import-associated
  - 50% of the importations were from the WHO European Region
  - 82% of cases were unvaccinated and 9% had unknown vaccination status
  - Of the unvaccinated, 79% had philosophical objections to vaccination, 5% had missed opportunities for vaccination, and 13% occurred among infants less than 12 months old.
- All persons > 6 months of age without evidence of measles immunity who travel outside the US should be vaccinated before travel:
  - 1 MMR for infants 6-11 months old.
  - 2 MMR for persons  $\geq$  12 months old.

See *Morbidity and Mortality Weekly Report* ([MMWR](#)) September 13, 2013.

## **INFLUENZA AND INFLUENZA VACCINES**

### **AAP Recommendations for Prevention and Control of Influenza**

- The American Academy of Pediatrics has published its yearly recommendations for prevention and control of influenza in children.
- Annual influenza immunization for children 6 months and above is recommended with either a trivalent or quadrivalent vaccine, as well as for all adults.
- The dosing algorithm for administration of influenza vaccine to children 6 months through 8 years of age is unchanged from the 2012–2013 influenza season.
- Oseltamivir (Tamiflu<sup>®</sup>) remains the antiviral treatment of choice. Zanamivir (Relenza<sup>®</sup>) is an acceptable alternative but is more difficult to administer.
- Antiviral treatment should be started rapidly when influenza is suspected or confirmed in hospitalized patients or patients at high risk of influenza complications.

For the full [article](#), see *Pediatrics*, October 2013.

### **Influenza and Pediatric Deaths in the US, 2004-2012**

- Between October 2004 and September 2012, there were 830 influenza-associated deaths in children in the US.
- Of those with a known medical history, 43% of children who died had no underlying medical condition.
- Influenza A was associated with 78% of the deaths, while influenza B was identified in 20% of the deaths.
- Pneumonia was the most frequently reported complication. Bacterial co-infections commonly included *Staphylococcus aureus* and *Streptococcus pneumoniae*.

For more information, see the [article](#) in *Pediatrics*, November 1, 2013.

### **Effect of Influenza Vaccination in Preventing Illness and Hospitalizations, 2005-2011**

- An analysis of data during 5 influenza seasons indicated that influenza vaccination averted approximately 13.6 million illnesses due to influenza, 5.8 million medical visits due to influenza, and 112,900 influenza-related hospitalizations during this time period.
- The largest number of averted cases occurred during the 2010–2011 influenza season, when 5.0 million influenza cases, 2.1 million medical visits, and 40,400 hospitalizations were prevented by influenza vaccination.
- The influenza season with the lowest number of averted outcomes was 2006–2007, when approximately 1.1 million influenza cases were averted.

For more details, see the [article](#) in *PLOS One*, June 19, 2013.

### **Effect of Postpartum Influenza Vaccination of Mothers in Preventing Infant Illness**

- To see the effect on the infant of maternal postpartum influenza vaccination, a study of 553 mothers and 573 neonates was done during the 2012–2013 influenza season.
- Influenza vaccination coverage rates ranged between 49% for mothers and 41.9% for the neonates' siblings. Overall, 45.6% of household contacts received influenza vaccination.
- Maternal postpartum influenza vaccination had a significant effect in protecting the newborn. In measuring infants' outcomes, maternal vaccination had 37.7% effectiveness against acute respiratory illness, 50.3% against a febrile episode, 53.5% against an influenza-like illness, 41.8% against related healthcare seeking, and 45.4% effectiveness against administration of antibiotics to the infant.

For more information, see the [abstract](#) in *Clinical Infectious Diseases*, December 1, 2013.

### **Influenza Vaccine Coverage in US from 2007-2008 to 2011-2012**

- Pediatric influenza vaccine coverage increased from 31.1% to 56.7%.
- Adult influenza vaccine coverage increased from 33.0% to 38.3%.
- In the 2011-2012 season, 66.9% of health care providers received influenza vaccine, and 43.0% of pregnant women received influenza vaccine.

For more information, see [MMWR](#), October 25, 2013.

### **US Influenza Vaccine Coverage for 2012-2013**

- [Healthcare providers](#) improved their influenza vaccine coverage to an overall coverage of 72.0%. Physicians' coverage increased to 92.3%. Nurses' coverage increased to 84.8%.
- [Pregnant women](#) increased their influenza vaccine receipt to 50.5%.
- [Arizona](#) had a 38.3% overall influenza vaccine coverage, one of the lowest percentages of all the states in the US. Pediatric coverage (6 months-17 years) was 48.9%. Adult coverage (18 years and above) was 34.9%. Additional data, interactive maps, and comparative tables can be found at CDC's interactive influenza [site](#), FluVaxView.

## **LITERATURE ON VACCINES AND VACCINE-PREVENTABLE DISEASES**

### **Higher Vaccine Exemptions Associated with Higher Pertussis Cases in California**

- In 2010, California had the highest number of pertussis cases since 1947. Although waning immunity of acellular pertussis vaccine was presumed to be an explanation, the effect of nonmedical exemptions (NME) were also studied.
- Geographic areas with high rates of NME were associated with high rates of pertussis.
- Both NME and pertussis clusters were associated with factors characteristic of high socioeconomic status.

For more details, see the [article](#) in *Pediatrics*, October, 2013.

### **Pertussis Vaccines Protect Against Disease but Not Against Infection and Spread**

- A study of pertussis vaccines in infant baboons showed that vaccinated baboons could still spread *Bordetella pertussis*.
- Four groups of baboons were studied: 1) recovered from *B. pertussis* infection, 2) unimmunized, 3) immunized with whole cell pertussis vaccine (DTwP), and 4) immunized with acellular pertussis vaccine (DTaP).
- The immunized baboons were vaccinated at 2, 4 and 6 months of age. Then at 7 months, all four groups were challenged with *B. pertussis*.
  - Previously infected baboons did not get sick and did not shed *B. pertussis*.
  - Unimmunized baboons became ill and shed *B. pertussis* from their nasopharynx for 30 days.
  - DTwP vaccinated baboons did not become ill but shed *B. pertussis* for 18 days.
  - DTaP vaccinated baboons did not become ill but shed *B. pertussis* for 35 days, and were able to infect previously uninfected and unvaccinated baboons.
- One explanation for the current resurgence of *B. pertussis* may be that DTaP vaccination gives individual protection against pertussis, but does not prevent nasal colonization or disease spread.

See the [abstract](#) in Proceedings of the National Academy of Science, early edition, approved October 22, 2013.

### **Pertussis Undervaccination Increases the Risk of Pertussis in Young Children**

- A matched case control study examined the effect of pertussis vaccine (DTaP) undervaccination in 3 month-36 months children with hospital admission.
- Compared to matched controls, children undervaccinated for 3 or 4 doses of DTaP vaccine were 18.56 and 28.38 times more likely to have received a diagnosis of pertussis than appropriately vaccinated children.
- The authors estimate that about 36% of the cases of pertussis could have been prevented with on-time DTaP vaccination.

See the [abstract](#) in *JAMA Pediatrics*, November, 2013.

### **Global Polio Eradication Efforts**

- In 1988, the World Health Assembly approved the goal of worldwide polio eradication. At the time, the estimated yearly number of new cases of paralysis due to polio was 350,000, and polio was endemic in 125 countries.
- Since 1988, the incidence of polio has been reduced by more than 99%, and only three countries have never terminated indigenous transmission of the polio virus: Pakistan, Nigeria, and Afghanistan.
- Wild-type polio virus type 2 has probably been eradicated since the last naturally occurring case was detected in 1999.
- Wild-type polio virus type 3 appears to be close to eradication, with no new cases detected in 2013 (as of October 31, 2013). However, wild-type poliovirus type 1 remains in circulation.

For the full [editorial](#), see *New England Journal of Medicine* (NEJM), November 21, 2013.

### **Polio Reappearing in Syria Puts Other Countries at Risk**

- Twenty-two cases of acute flaccid paralysis have appeared in Syria. The World Health Organization (WHO) has confirmed polio virus was the cause of 10 of these cases.
- Polio's reappearance in Syria is probably a result of a decrease in child immunization rates due to civil war.
- Most polio infections are asymptomatic. Since the ratio of paralytic polio to non-paralytic infection is about 1:200, there are likely many more cases of polio infection in Syria.
- Wild polio virus has been found in sewage in several towns in southern Israel, the West Bank, and Gaza.
- The European Centre for Disease Control and Prevention (ECDC) and WHO estimate that there is high risk of international spread of polio virus from these countries given the prolonged circulation of polio virus over a large area.
- Most European Union countries immunize with inactivated polio vaccine (IPV), which protects the individual but does not stop oral-fecal spread of wild polio virus. Thus, there is a risk of silent transmission of wild polio virus into surrounding countries by asymptotically infected people or by people who have been vaccinated with IPV rather than oral polio vaccine (OPV). Vaccination with OPV protects individuals from polio infection while also preventing fecal shedding of the wild type polio virus.

For more information, and for a map of at-risk European countries, see the [article](#) in *Scientific American*, October 29, 2013.

### **Polio Outbreak in China in 2011**

- China was certified as a polio-free region in 2000. In 2011, an outbreak with imported wild-type polio virus type 1 caused acute flaccid paralysis in 44 people in the province of Xinjiang in western China.
- In order to stop the outbreak, five rounds of vaccination with live, attenuated oral polio virus vaccine (OPV) were given to children and adults. Trivalent OPV was used in three rounds, and monovalent OPV type 1 was used in two rounds. Forty-three million doses of OPV were administered.
- The outbreak was stopped 1½ months after laboratory confirmation of the index case.
- Polio-free countries remain at risk for outbreaks while the polio virus circulates anywhere in the world. Global eradication of wild-type polio virus will benefit all countries, even those that are currently free of polio.

For more information, see the [article](#) at NEJM, November 21, 2013.

### **Japanese Encephalitis Vaccine Now Approved for Ages Two Months and Above**

- Japanese encephalitis virus, a mosquito-borne virus, is an important cause of severe encephalitis in Asia.
- Ixiaro® is an inactivated Japanese encephalitis vaccine that was previously approved only for 17 years old and above.
- This year FDA licensed Ixiaro® for ages 2 months and above. CDC has just published the same recommendations.

For more information, see the [article](#) in MMWR, November 15, 2013.

## **RESOURCES**

### **How to Find an Influenza Vaccine**

- Influenza season is just beginning in [Arizona](#) and in the [US](#). It is not too late to get an influenza vaccine.
- There are many locations where influenza vaccines and other vaccines can be obtained.
  - The site [www.flu.gov](http://www.flu.gov) shows locations for influenza vaccines based on zip code.
  - See the Arizona Department of Health Services' and The Arizona Partnership for Immunizations' document on "[Where to Get Flu Vaccine.](#)"
  - [Arizona 2-1-1](#) has county-specific links to county health departments. County health departments either have influenza vaccines available or can help people find local locations to get influenza vaccines.
    - Assistance in finding influenza shots through Arizona 2-1-1 can also be done by telephone by calling 2-1-1 anywhere in Arizona, or 877-211-8661 from anywhere in the United States.

### **Influenza Information Translated into Multiple Languages for Refugees**

- The CDC has translated [pamphlets](#) about influenza into Amharic, Arabic, Burmese, Dzongkha, Farsi, Karen, Kirundi, Nepali, Oromo, Somali and Spanish.

- Please feel free to distribute ADHS' *Arizona Vaccine News* to any of your partners who may be interested. Past issues of *Arizona Vaccine News* can be found at: <http://www.azdhs.gov/phs/immun/vacNews.htm>