Communicable Disease & Immunization Update

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Pertussis Update

The pertussis epidemic in Washington State continues. As of September 15, 2012, there have been 653 confirmed cases of pertussis in Pierce County in 2012, compared with 90 cases as of August 31, 2011. Pierce County has seen higher case rates than surrounding counties; as of September 15, 2012, our rate per 100,000 of population is 80.2 compared with 32.9 in King County, 30.6 in Kitsap County and 14.7 in Thurston County[1]. In Pierce County as of September 15, 2012, 11 persons have been hospitalized, 9 of these hospitalizations have occurred in infants under age 3 months. There have been no pertussis deaths in Washington so far in 2012. In 2011, two infants in Washington State died.

From January through June 2012, 68% of cases in Pierce County have been children of school age, most of whom (about 90%) fully immunized. While unimmunized children are not driving the epidemic, they are at higher risk for disease than fully immunized children. From January through July 2012, there were 14 infant cases age 6–12 months, 6 of whom were under- or un-immunized.

From January through June there were 43 infant cases reported in Pierce County. So far in 2012, 14% of infant cases have been Hispanic (Hispanics make up about 9% of Pierce County population).

As of September 2012, 48 states and Washington, D.C. have reported increases in disease compared with the same time period in 2011. Centers for Disease Control and Prevention (CDC) announced that 29,000 cases of pertussis were reported through September 20, 2012. There have been 14 pertussis-related deaths in the United States so far in 2012. The majority of deaths continue to occur among infants younger than 3 months of age. Besides the epidemic in Washington State, there are epidemics in Minnesota (over 3,558 cases reported as of September 20, 2012) and Wisconsin (4,463 as of September 17, 2012).

Resurgence of Pertussis

Pertussis-containing vaccines became available in the 1940s, and disease rates plummeted by the 1950s, sustaining very low rates (<1 case/100,000 population) through the 1970s. Since 1980, there has been a resurgence of the disease and case rates increased in the United States to 9/100,000 in 2004[2]. Disease levels began trending downward in 2005, and then surged again a few years later. An epidemic in California in 2010 led to the largest number of cases in 50 years (>9,000 cases and 10 infant deaths).

In both the pre- and post-vaccine eras, cyclic peaks in pertussis have occurred every 2–5 years, indicating that circulation of pertussis in the population has not essentially changed even with widespread childhood vaccination[2]. What has changed is the severity of reported disease and the demographic of reported cases. Pre-vaccine, more than 93% of cases were children, and 10% were infants. In later years after widespread use of vaccine, we saw a shift to older age groups, and now about 65% of cases are over age 10. It is estimated that only about 10% of pertussis cases are reported, due to the wide range of severity of symptoms that people can experience.

Why are Pertussis Epidemics Occurring Now?

There are probably several reasons that we are seeing pertussis at epidemic levels. Among the reasons are waning of vaccine-induced immunity and waning immunity from disease; decreased effectiveness of the acellular pertussis vaccine (as opposed to the whole-cell vaccine used prior to 1999); improved diagnostics and increased awareness of

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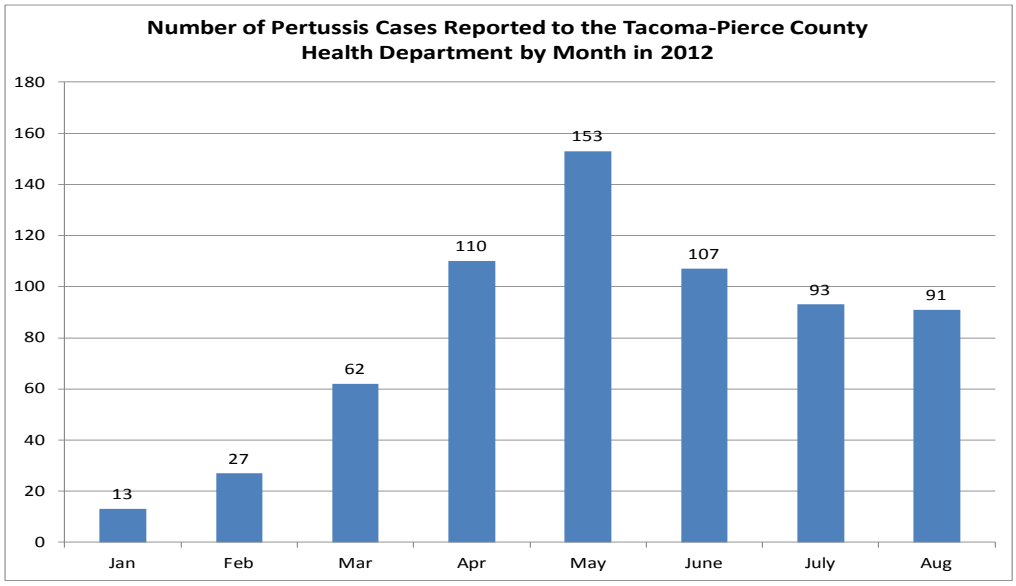


physicians to test for and diagnose pertussis among all age groups. Also proposed is that the pertussis bacterium has undergone genetic changes that have increased resistance to vaccines, although at this time there isn't conclusive evidence to support this theory.

The current CDC immunization bible (The Pink Book) states that point estimates of efficacy of the DTaP are 80–85%, based on various studies[3]. Dr. James Cherry, a nationally-known expert on pertussis, has stated that estimates of vaccine efficacy have been inflated due to observer bias, flaws in study implementation and because disease case definitions used in clinical trials focused on prevention of severe symptoms only[4]. He cites one study where efficacy fell to 73% when a cough illness of ≥7 days was used (as opposed to ≥21 days). Waning of immunity post-vaccination is well-known, and the duration of immunity for persons vaccinated with acellular pertussis vaccine (DTaP) has been found to be shorter than the immunity that was provided by the whole-cell DTP vaccine.

DTaP replaced whole cell DTP in the United States in the late 1990s because of a much reduced side effect profile. A study published recently on duration of immunity following immunization with pertussis containing vaccines found vaccine effectiveness to be 41%, 24% and 79% for children age 2–7 years, 8–12 years, and 13–18 years, respectively. The marked increase of pertussis in ages 8–12 years old was due to the longer period of time that had passed since persons in this age group had received the last pertussis vaccine[5].

Epidemiologic study of outbreaks here and in other states will help to contribute to the knowledge of vaccine effectiveness. Your offices may have been visited recently by a team of CDC and state health department epidemiologists to review patient records as part of a study to determine duration of immunity following Tdap in adolescents. The Advisory Committee for Immunization Practices of the CDC, the group that sets immunization policy, will look at these data and determine if more frequent booster doses of DTaP and Tdap should be recommended.

Do we need better pertussis vaccines and/or a more effective vaccination schedule? Definitely yes. However, pertussis vaccines currently do work well, as evidenced by the fact that prior to these vaccines, about 5,000 babies per year died of pertussis . Remind parents and patients who are considering not vaccinating of this and the sad fact that pertussis still kills hundreds of thousands of babies worldwide.

Sources:

1. Washington State Pertussis Surveillance Report (www.doh.wa.gov/Portals/1/Documents/Pubs/348-254-PertussisUpdate.pdf) Accessed 8/31/2012.
2. Cherry, James D. The Present and Future Control of Pertussis. Clinical Infectious Diseases, 2010: 51; 663–667.
3. Epidemiology and Prevention of Vaccine-Preventable Diseases, The Pink Book www.cdc.gov/vaccines/pubs/pinkbook/index.html
4. Cherry, James D. Why Do Pertussis Vaccines Fail?. Pediatrics, 129, (5), 968–970.
5. Witt, M.A., et al. Unexpectedly Limited Durability of Immunity Following Acellular Pertussis Vaccination in Preadolescents in a North American Outbreak. Clinical Infectious Diseases, (2012) 54 (12); 1730–1735.
6. CDC Fact Sheet: Childhood Whooping Cough Vaccine Protects Most Children For At Least 5 years (www.cdc.gov/media/matte/2011/10_whooping_cough.pdf)

Preparing for the Flu Season 2012–2013

The 2011–2012 influenza season was off to such a late start, we were seeing cases well into June and the occasional case even later. In Washington State, the peak of the season occurred in early April, several weeks later than the typical peak in February. Compared with previous seasons since 2008 the past influenza season was the least severe and the latest starting influenza season in 24 years. Influenza B accounted for the majority of positive tests for influenza in Washington State which is also unusual[1].

For the 2012–2013 season, the trivalent influenza vaccine will contain A/California/7/2009-like (pH1N1); A/Victoria/361/2011-like (H3N2); and B/Wisconsin/1/2010-like (B/Yamagata lineage). This represents changes from last season in the A-H3N2 and the influenza B components. Last season in the United States, 51% of the influenza B viruses identified by WHO/NREVSS participating laboratories were of the B/Yamagata lineage and not covered by last season's influenza vaccine. A quadrivalent live-attenuated nasal spray vaccine that contains both B/Yamagata and B/Victoria strains will be available for the 2013–2014 season. Injectable quadrivalent vaccine is expected to follow shortly.

Since 2010, Centers for Disease Control and Prevention (CDC) has recommended that all persons over age 6 months receive an annual influenza vaccination, unless they have a severe egg allergy or have had a previous severe allergic reaction to a flu vaccine. In 2011, CDC recommended that persons who have egg allergy can receive flu vaccine with safety precautions, and there was no increase in reported allergic reactions during the 2011–2012 season. For the 2012–2013 season, the recommendations concerning egg allergy are as follows:

- If a person can eat scrambled eggs, they can have a flu vaccination per the usual routine;
- If a person reports hives only, they can receive injectable flu vaccine (not LAIV) and observe for 30 minutes; or
- If a person reports having egg allergy resulting in respiratory symptoms, cardiovascular changes, repeated vomiting or has ever received epinephrine or medical treatment for egg allergy, they should be referred to a physician experienced in management of allergic conditions for evaluation.

To increase immune response, children under age 9 need 2 doses of flu vaccine the first season that they receive flu vaccinations. We are still playing catch up ensuring two doses of 2009 H1N1 vaccine for children under age 9, and the recommendations for the number of doses for these children has changed again this year. There are two approaches that can be taken and are described in detail in the August 17 MMWR[2]. The simpler approach is as follows:

- If a child under 9 has had at least two seasonal influenza vaccines since July

2010, they only need one dose of flu vaccine this season. If they had one or less since July 2010, or are unsure, give two doses separated by at least 28 days.

During the 2010–11 influenza season, CDC and the FDA conducted enhanced monitoring for febrile seizures after influenza vaccination because of reports of an increased risk for fever and febrile seizures in young children in Australia associated with a 2010 Southern Hemisphere vaccine produced by CSL Biotherapies (up to nine febrile seizures per 1,000 doses). Because of the findings in Australia, Advisory Committee on Immunization Practices (ACIP) does not recommend the United States-licensed CSL Biotherapies, Afluria, for children aged <9 years.

The enhanced surveillance for febrile seizures during the 2010–11 season suggested a small increase in risk for children age 6 months–4 years on the day of vaccination and one day post, and was higher when children received PCV13 at the same time. After further evaluation of the data and taking into consideration benefits and risks of vaccination, no policy change was recommended for the 2011–12 season. Further surveillance conducted during the 2011–12 influenza season resulted in findings consistent with those from the previous season. No changes in the use of flu vaccine or PCV13 are recommended for the 2012–13 influenza season.

Influenza vaccine is currently available in the community at provider offices, health facilities and pharmacies. With vaccine now routinely available beginning in August, we have a longer opportunity to ensure vaccination for as many patients as possible. Health care workers should get vaccinated to protect themselves and their patients. As last season clearly demonstrated, influenza circulates well into the spring, so please remember to continue vaccinating patients throughout the influenza season.

Sources:

1. Washington State Influenza Surveillance Report (www.doh.wa.gov/portals/1/Documents/5100/fluupdate.pdf). Accessed 8/31/2012.
2. Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP)—United States, 2012–13 Influenza Season. MMWR August 17, 2012/61(32);613–618.

Novel Influenza A Virus Associated with Swine

In 2012, as of September 17, 306 people from 10 states are reported to have been infected with an influenza A H3N2 variant virus (H3N2v). This is a swine flu virus that has acquired the matrix (M) gene from the 2009 H1N1 pandemic virus. Detected in U.S. pigs in 2010 and humans in July 2011, this virus appears to spread more easily from pigs to people than other variant viruses. Infections have been reported in ten states (Hawaii [1], Illinois [4], Indiana [138], Maryland [12], Michigan [5], Minnesota [1], Ohio [98], Pennsylvania [6], West Virginia [3], and Wisconsin [8]). Investigations into H3N2v cases indicate that the main risk factor for infection is exposure to pigs; mostly in fair settings. Most cases to date have occurred in children, who have little immunity against this virus. So far during the current outbreaks, 16 confirmed cases have been hospitalized as a result of their illness; and one death has occurred. Although the vast majority of cases have been associated with exposure to pigs, there have been three instances where human-to-human transmission is thought to have occurred. At this point, there has been no ongoing human-to-human transmission.

Surveillance has also recently identified 2 more swine flu cases with yet different viruses. Missouri recently reported an infection with an H1N1v virus and Minnesota recently reported infections with an H1N2v virus. Both of these variant viruses contained the matrix gene from the 2009 H1N1 virus, and have been associated with contact to pigs.

Centers for Disease Control and Prevention (CDC) is urging increased vigilance at fairs, petting zoos and farms to look for symptoms of influenza among pigs and to isolate animals that appear ill and not transport them to events where the public may be exposed. But like human influenza infections, pigs can be infected and contagious with influenza and not show any symptoms. Testing of a sampling of pigs shown at the Minnesota State Fair during the 2009 H1N1 influenza pandemic revealed that 19% of them were infected with flu viruses, even though they looked healthy[1].

We have been in contact with local agricultural entities, including the Western Washington fair about the CDC recommendations and have ensured that public venues will post appropriate signage about hand washing after animal contact and not eating in the animal environments. The Fair provides many hand washing stations, and parents should make sure their kids use them after visiting the barns and piglet pens.

If you see a possible case of influenza after exposure to pigs, please collect a nasopharyngeal swab and place in viral transport media. Then call us at (253) 798-6410 for instructions on how to send the specimen to the Washington State Public Health Lab.

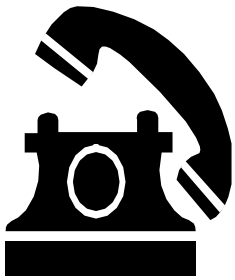
Source:

1. Gregory C Grey, et al., Influenza A(H1N1) pdm09 Virus among Healthy Show Pigs, United States. Emerging Infectious Diseases, Vol 18. No 9; Sept 2012 (wwwnc.cdc.gov/eid/article/18/9/12-0431_article.htm). Accessed 8/30/12.

REPORTED CASES OF SLECTED DISEASES FOR MONTH ENDING AUGUST 2012

(preliminary case counts)

ENTERIC DISEASE	This Month	2012 to Date	YTD 1/11-8/11
Campylobacter	21	149	82
Cryptosporidium	2	12	29
Giardia lamblia	6	37	27
Hemolytic Uremic Syndrome (HUS)	0	0	0
Salmonella	9	50	25
Shigella	2	2	1
Enterohemorrhagic E. coli	1	6	10
HEPATITIS			
Hepatitis A (Acute)	0	1	1
Hepatitis B (Acute)	0	0	1
Hepatitis C (Acute)	0	1	0
Hepatitis B (Chronic)	13	66	60
Hepatitis C (Chronic)	60	523	509
INVASIVE DISEASE/BACTERIAL			
Meningococcal	0	3	0
Listeriosis	1	1	0
SEXUALLY TRANSMITTED DISEASES			
Chlamydia	365	2,919	2,465
Gonorrhea	80	396	275
Syphilis-Primary, Secondary & Early Latent	5	30	19
Syphilis, Late & Late Latent	1	18	10
TUBERCULOSIS			
Tuberculosis	2	15	18
VACCINE PREVENTABLE DISEASE			
Measles	0	0	0
Mumps	0	0	0
Rubella	0	0	0
Pertussis	91	659	93
OTHER DISEASES			
Botulism (wound)	0	0	0
Dengue Fever	0	1	0
Legionella	0	2	4
Lyme Disease	0	2	2
Malaria	0	3	0
Rabies Prophylaxis	4	32	5
Typhoid Fever	0	0	0
West Nile Virus	1	1	0
Yersinosis	0	2	1



Please remember to report communicable diseases to the Health Department. Accurate reporting helps to stop the spread of communicable diseases and helps us to gain knowledge about our community. Provider and laboratory reporting of specific diseases is required bylaw.

24-hour Reporting Line
(253) 798-6534

Confidential Fax Line for Case Reports
(253) 798-7666