Communicable Disease & Immunization Update

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Tacoma-Pierce County Health Department
Healthy People in Healthy Communities

Zika Virus Outbreak

The first cases of Zika virus in the Americas were reported from February-June 2014 on Easter Island, Chile. The virus was implicated as the cause of clusters of rash illness in Brazil in spring of 2015, and the outbreak later spread to other countries in South and Central America, Mexico and the Caribbean. Transmission is also occurring in American Samoa, Marshall Islands, Samoa and Tonga. As of May 5, 2016, Zika transmission has occurred in 38 countries in the Americas with over 289,000 suspected and 8,672 lab confirmed cases reported.

Zika virus is a mosquito-borne flavivirus in the same family as dengue, yellow fever, Japanese encephalitis, West Nile and chikungunya. It was first identified in rhesus macaques in Uganda in 1947 (in the Zika forest). Sporadic human infections were reported from Africa and Asia, and the first time the virus was detected outside those regions was during an outbreak on the island of Yap in the Federated States of Micronesia in 2007. Prior to this outbreak, only 14 infections had been documented. An outbreak in French Polynesia in 2013 resulted in over 100,000 cases.

Zika is spread by the *Aedes aegypti* mosquito. The current range of this mosquito extends into the southern and southwestern U.S., and has invaded an area within southern California. *Aedes aegypti* lives 2-4 weeks and can feed on several people during its lifetime, transmitting disease.

The mosquito likes urban areas and can breed in just a few drops of little standing water, making it very difficult to control. Areas with poor sanitaiton are particularly hard-hit as the mosquito thrives in areas with accumulated trash where water can collect.

Symptoms

Up to 80% of persons infected are asymptomatic. If there are symptoms, they are usually mild and last for 2-7 days. The symptoms are fever, transient joint pain and possible swelling (mainly in the small joints in the hands and feet), maculo-papular rash and conjunctivitis. Myalgia and headaches have also been reported. The incubation period ranges from 3 to 12 days. The illness may be difficult to distinguish between dengue fever and chikungunya, although those viruses tend to cause more severe joint pain and frequently higher fever.

Neurological Sequelae

As of of Apr. 30, 1,271 cases of microcephaly have been confirmed in Brazil. The occurrence of microcephaly in association with Zika virus was not documented in the Yap Island outbreak. Although transmission of Zika from mother to fetus was documented in two newborns during the outbreak in French Polynesia, an increase of central nervous system malformations in fetuses and newborns was not detected at the time. Retrospectively, researchers in French Polynesia found 17 cases of congenital CNS malformations which is many more than usual for these islands. The size of the affected populations (French Polynesia, 270 000 inhabitants; Yap Island 11,241) and the number of births could make it difficult to recognize an association between the virus and birth defects. It is interesting to note that in the U.S. in 2003-2004, 2 cases of microcephaly occurred among 72 births in mothers who had West Nile infection during pregnancy.

Increases in Guillain-Barre syndrome (GBS) have also been noted in Brazil, Columbia, Dominican Republic, El Salvador, Honduras, Suriname and Venezuela. In all of these countries, there has been at least one GBS case with lab-confirmed Zika virus infection. French Guiana, Haiti, Martinique, Panama and Puerto Rico have reported at least one GBS case with confirmed Zika virus infection, but no overall increases in GBS cases.

Sexual Transmission

Sexual transmission of Zika infection has been documented twice prior to the current outbreak. In both cases, males with hematospermia transmitted the disease to female partners. In February 2016, CDC had received reports of 14 instances of suspected sexual transmission. Among these, 2 lab confirmed and 4 probable cases are in women whose only risk factor is sexual contact with a symptomatic male partner who had traveled to an area where Zika virus transmission is occurring. The length of time that the virus may be present in semen is unknown, but a recent report described Zika virus RNA in semen 62 days post onset of illness. Men who have traveled to an area of ongoing Zika virus transmission who have a pregnant partner should abstain from sexual activity or consistently and correctly use condoms during sex with their pregnant partner for the duration of the pregnancy.

Couples who are trying to get prgnant and who have traveled to a Zika-affected area should wait at least 8 weeks after the return from travel to attempt pregnancy. Men with symptoms of Zika or who have confirmed infection should wait at least 6 months after symptoms cease bfeore having unprotected sex.

Testing for Zika Virus

Polymerase Chain Reaction (PCR) for Zika virus can be detected in serum up to seven days after illness onset. Antibody tests can also be done at CDC, but positive results may be difficult to interpret as these assays cannot reliably distinguish between Zika and dengue virus infections. Plaque-reduction neutralization tests (PRNT) can be performed to measure

virus-specific neutralizing antibodies and may be able to discriminate between cross-reacting antibodies in primary flavivirus infections. For symptomatic patients, testing for dengue and chikungunya should also be done, and are readily available at commercial labs.

In late April, the FDA granted emergency use authorization for Zika PCR testing on serum; Quest laboratories has this avilable now. However, a negative PCR only rule out disease in persons with symptoms in the first 3 days after onset. Washington State Dept of Health has asked lab directors to report both positive and negative tests to local health departments, so that we can follow up to see whether testing at CDC may be necessary.

Testing is available through CDC for no charge to the patient if certain criteria are met, which are:

- **All persons** reporting two or more of the following symptoms: acute onset of fever, maculopapular rash, arthralgia, or conjunctivitis, during or within 2 weeks of travel. Obtain specimens during the first week of illness if possible.
- **Pregnant women** who have traveled to Zika affected areas, regardless of symptoms. For a list of countries see www.cdc.gov/zika/geo/index.html
  - If fetal ultrasounds detect microcephaly or intracranial calcifications, pregnant women who originally tested negative for Zika virus infection following travel should be retested for Zika virus infection. Also consider amniocentesis for Zika virus testing.
- **Women experiencing fetal loss** with travel to an area with known Zika virus transmission during pregnancy if not previously tested
- **Babies** born to women with a history of travel during pregnancy to an area with Zika virus transmission, with evidence of maternal infection (mothers with positive or inconclusive test results for Zika virus infection) or fetal infection (infants with microcephaly or intracranial calcifications).

Travel

It is important for health care providers to screen for travel, especially for women who are pregnant. CDC advises that women who are pregnant or who are planning pregnancy to postpone travel to Zika affected areas.

Reporting

Call (253) 798-6410 to report a suspect case or asymptomatic pregnant woman who needs testing.

Sources

1. European Centre for Disease Prevention and Control. Rapid risk assessment: Microcephaly in Brazil potentially linked to the Zika virus epidemic – 24 November 2015. Stockholm: ECDC; 2015.
2. Duffy, M. Zika Virus Outbreak on Yap Island, Federated States of Micronesia. NEJM; 360;24, June 11, 2009.
3. Besnard, M. et al Evidence of perinatal transmission of Zika virus, French Polynesia, December 2013 and February 2014 . Euro Surveill. 2014;19(13):pii=20751.
4. PAHO website www.paho.org/hq/index.php?option=com_content&view=article&id=11585&Itemid=41688&lang=en
5. Washington State Dept of Health Guidelines for local health departments.

Congenital Syphilis

Two congenital syphilis cases have been reported in Pierce County in the past 6 months. Congenital syphilis is a fortunately rare consequence of untreated syphilis in pregnant women. However, congenital syphilis is preventable and the goal is zero cases. Both cases arose from a constellation of circumstances including one or more of the following factors: late-or-no prenatal care, late report of the positive result to public health, incomplete post-natal evaluation and treatment of the infant, and an uncooperative mother. Fortunately both cases were based solely upon serology; neither appears to have suffered acute clinical consequences of infection.

Although ongoing syphilis transmission in Pierce County primarily affects men who have sex with men, cases among heterosexual men and women do occur and suggest that additional pregnant women may be at risk for delivering infected infants.

Health care providers are required by Washington State law to conduct syphilis screening for pregnant women to report to the Health Department clinical or laboratory-based diagnosis of syphilis.

Clinical Manifestations of Congenital Syphilis

- Stillbirth, pre-term/low-birthweight, or congential anomalies
- Non-immune hydrops, jaundice, hepatosplenomegaly, rhinitis, skin rash, or pseudoparalysis of an extremity
- Bone abnormalities.
- Pneumonia
- Meningitis

The infant should be evaluated by a pediatric infectious disease specialist. Evaluation includes:

- Serology (treponemal and non-treponemal tests) from infant peripheral blood (not cord blood)
- CSF analysis for VDRL, cell count, and protein
- Complete blood count (CBC) and differential and platelet count, hepatic function panel
- Long-bone radiographs
- Chest radiograph
- Histopathologic examination of placenta
- Other examinations as indicated (e.g., neuroimaging, ophthalmologic examination, and auditory brain stem response)

Injectable penicillin is the only acceptable treatment. The specific regimen recommended depends on the outcome of infant's and mother's evaluation. The Health Department will follow up with the mother and her sex partners from the past 12 months.

Requested Actions

- Conduct a serologic test for syphilis (e.g., treponemal EIA) and human immunodeficiency virus (HIV) among all pregnant women at the first prenatal care encounter.
- If a seronegative woman appears to be at high-risk for acquiring syphilis during pregnancy (e.g., multiple partners, bisexual partner, drug use, prostitution), repeat testing at the beginning of the third trimester.
- Report positive serologic test results in pregnant women, neonates, and all other patients to the Health Department within 72 hours by calling (253) 798-6410, or (253) 798-6534 (24 hour reporting line).

We will provide you with guidance in completing the pre-treatment evaluation, providing the appropriate therapy, and ensuring evaluation of sex partners.

Pertussis in Pierce County and Tdap During Pregnancy

Matthew Rollosson, RN, MPH&TM

Historically, pertussis was thought of as a childhood disease. We now recognize that immunity to pertussis, through immunization or natural infection, wanes over time, and that the effectiveness of acellular pertussis vaccines wanes much more quickly than immunity from whole-cell pertussis vaccines. A case-control study reviewing data from the 2012 pertussis epidemic in Washington State demonstrated that, for children who had received all acellular pertussis vaccines, vaccine effectiveness was 73.1% within one year, 54.9% between one and two years, and 24.2% between two and three years (Acosta et al., 2015). Two studies of data from the 2010 pertussis epidemic in California demonstrated that children who received one or more doses of whole-cell pertussis vaccine were less likely to have polymerase chain reaction (PCR)-confirmed pertussis than children who had received all acellular pertussis vaccines (Klein et al., 2013; Witt et al., 2013).

The age distribution of pertussis cases in Pierce County in 2012 was similar to that in California in 2014 (Winter et al., 2014), with fewer cases at the ages at which pertussis vaccine booster doses are scheduled and fewer cases and lower incidence of pertussis in people born before 1997 who would have received at least one dose of whole-cell pertussis vaccine as part of their primary series.

Infants too young to receive pertussis-containing vaccine are at highest risk for complications and death from pertussis. During the 2012 epidemic, the incidence of pertussis in Pierce County and Washington State was highest in children under one year of age. Of the 15 Pierce County residents hospitalized for pertussis in 2012, 12 (80%) were under one year of age and 11 of those were under 6 months of age, too young to have received 3 doses of DTaP.

In 2015, 5 Pierce County residents were hospitalized for pertussis, three of whom were infants less than 2 months of age. Two of the mothers of those babies did not receive the recommended dose of tetanus, diphtheria, and acellular pertussis vaccine (Tdap) during pregnancy.

Case Series

Case 1- Two-month-old girl with worsening cough admitted for observation with PCR-confirmed pertussis. Her mother received Tdap during pregnancy. While hospitalized, the infant had mild desaturations during coughing fits which quickly resolved without intervention. The baby was observed on the pediatric unit, not intensive care unit (ICU), and was discharged home on day three.

Case 2- One-month-old girl admitted with repeated episodes of desaturation and bradycardia. On the second day after admission, the baby was intubated and mechanically ventilated with sedation and chemical paralysis. She spent 8 days intubated, 11 days in the pediatric intensive care unit (PICU), and was discharged to home on day 15. Her mother did not receive Tdap during pregnancy.

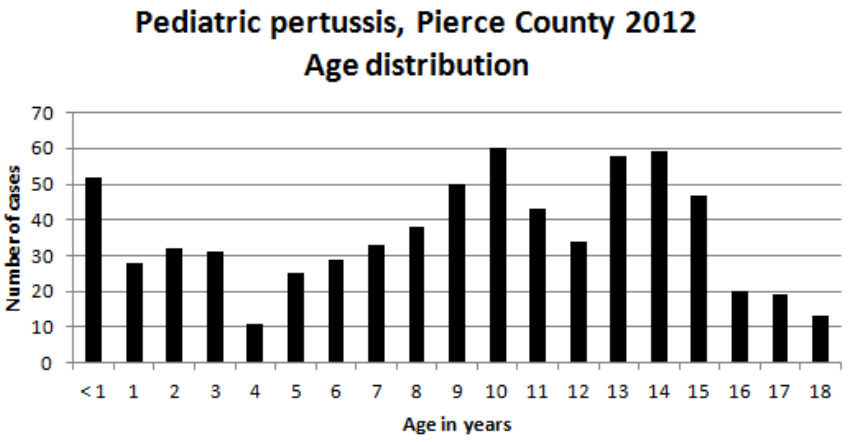
Case 3- Three-week-old girl admitted after an episode of choking cough, apnea and cyanosis. Although the obstetric care provider recommended that her mother get a Tdap at the pharmacy, she did not receive one. The baby spent 3 weeks in PICU and was discharged four weeks after admission.

Although this sample is not representative, it is notable that the child whose mother received Tdap during pregnancy was not admitted to the PICU and had the shortest length of stay.

Antibody titers in adults who receive Tdap also wane. Healy et al. (2013) found that titers of pertussis-specific antibodies in cord blood from mothers who had received Tdap before or early in pregnancy were unlikely to provide adequate protection against infection for their newborn infants. In October 2012, the CDC's Advisory Committee on Immunization Practices (ACIP) recommended Tdap at 27 to 36 weeks of gestation with every pregnancy based on studies of paired maternal and cord blood from women who received Tdap during pregnancy. The American College of Obstetricians and Gynecologists (ACOG) and the American College of Nurse-Midwives support the ACIP recommendation.

Two studies conducted in the U.K. evaluated the effectiveness of maternal Tdap at preventing pertussis in infants too young to receive DTaP. Vaccine effectiveness was 93% for infants born to women who received Tdap in the third trimester (Dabrera et al., 2015) and 90% for infants younger than 2 months whose mothers received Tdap at least 1 week before birth (Amirthalingam et al., 2014).

Although estimates since the 2012 recommendation have not yet been published, uptake of Tdap during pregnancy has been lower than optimal. As part of a pilot project, the Washington State Department of Health is currently collecting data on Tdap during pregnancy from hospitals in selected counties, including Pierce. Data are preliminary, but, in 2014, less than 50% of women who delivered at Pierce County hospitals had a dose of Tdap during the pregnancy that was recorded in the hospitals' electronic medical record. Administering Tdap during a prenatal visit is the most effective way to ensure that a pregnant woman receives the dose. CDC recommends that providers who do not stock vaccines in their offices make a "strong referral" for vaccination. Resources supporting immunizing pregnant women are found on the ACOG, CDC, and Tacoma-Pierce County Health Department websites. These include standing orders, prescription forms, screening and consent forms, billing information for providers, and patient education materials.



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Hyperlinked references available from Matthew Rollosson at mrollosson@tpchd.org.

Reported Cases of Selected Diseases, Preliminary Data

ENTERIC DISEASES	April 2016	2016 to Date	YTD 1/15 - 4/15
Campylobacter	16	57	76
Cryptosporidium	1	4	6
Giardia lamblia	6	13	18
Salmonella	3	16	16
Shigella	1	5	3
Enterohemorrhagic *E. coli*	0	3	3
HEPATITIS			
Hepatitis A (Acute)	0	0	0
Hepatitis B (Acute)	0	1	0
Hepatitis C (Acute)	1	5	9
Hepatitis B (Chronic)	12	78	62
Hepatitis C (Chronic)	108	427	469
INVASIVE DISEASES/BACTERIAL			
Haemophilus influenzae	0	0	0
Listeria monocytogenes	0	0	3
Meningococcal Disease	1	3	0
SEXUALLY TRANSMITTED DISEASES			
Chlamydia	448	1,609	1,477
Gonorrhea	86	340	433
Herpes, Initial Infection	42	193	107
Syphilis, Primary & Secondary	4	15	12
Syphilis, Early Latent	8	17	6
Syphilis, Late & Late Latent	5	21	15
Syphilis, Congenital	0	0	0
Syphilis, Neuro	0	0	0
TUBERCULOSIS			
Tuberculosis	1	6	2
VACCINE PREVENTABLE DISEASES			
Measles	0	0	0
Mumps	0	0	0
Rubella	0	0	0
Pertussis	13	21	59
OTHER DISEASES			
Botulism (wound)	0	0	0
Botulism (infant)	0	0	0
Botulism (foodborne)	0	0	0
Brucellosis	0	0	0
Chikungunya	0	0	1
Cocciiomycosis	0	0	1
Cyclosporiasis	0	0	0
Dengue Fever	0	0	1
Legionella	0	0	1
Leptospirosis	0	0	1
Lyme Disease	0	0	0
Malaria	0	0	1
Paralytic Shellfish Poisonin	1	1	0
Prion Disease, Human	0	0	1
Relapsing Fever	0	0	0
Tulameria	0	0	0
Typhoid Fever	0	0	0
Vibrio	0	1	0
West Nile Virus	0	0	0
Yersiniosis	1	2	2

Please remember to report communicable diseases to the Health Department. Accurate reporting helps stop the spread of communicable diseases. Provider and laboratory reporting of specific diseases is required by law.

24-Hour Reporting Line

(253) 798-6534

Confidential Fax Line for Case Reports

(253) 798-7666