Helen Y. Chu, MD MPH
Division of Allergy & Infectious Diseases
University of Washington

Prevention of Infections in Mothers & Infants

June 2, 2015

Midwives Association of Washington State Conference

Seattle Children's HOSPITAL • RESEARCH • FOUNDATION

UW Medicine
UW SCHOOL OF MEDICINE

Financial Disclosures

- I receive research funding from the Bill & Melinda Gates Foundation, PATH Vaccine Solutions, the National Institutes of Health, Glaxo Smith Kline, and the Centers for Disease Control

Outline

1. Management of potential exposures during pregnancy
   - Varicella zoster virus (Chickenpox)
   - Hepatitis B
   - Influenza

2. Currently Recommended Vaccines in Pregnancy
   - Influenza
   - Pertussis

Case 1

A pregnant nurse was exposed to varicella zoster virus (VZV) while taking care of a patient on the stem cell transplant unit. She did not recall ever having chickenpox. The day her patient developed lesions, she called her midwife to ask if this was a problem.

Case 1

What is the next step in management?

A. Nothing to do. We can assume that she has had chickenpox in the past.
B. Administer the varicella vaccine
C. Start varicella immunoglobulin (VZIG)
D. Send varicella IgG and wait for the results if < 10 days after exposure

Case 1: Management

Step 1: Define exposure

- Criteria for ppx: Same hospital room, face-to-face contact > 5 min, household contact

Step 2: Evaluate if patient is immune

- Women who self-report prior infection are most likely immune
- Women who have a negative or uncertain history: most are immune as well - send a varicella IgG – need results back < 10 days after exposure

Step 3: Prophylaxis

- Varicella IgG +: Nothing to do – she is immune
- Varicella IgG -: Adminster Varizig If varicella IgG is negative and < 10 days after exposure

NO VARICELLA VACCINE IN PREGNANCY

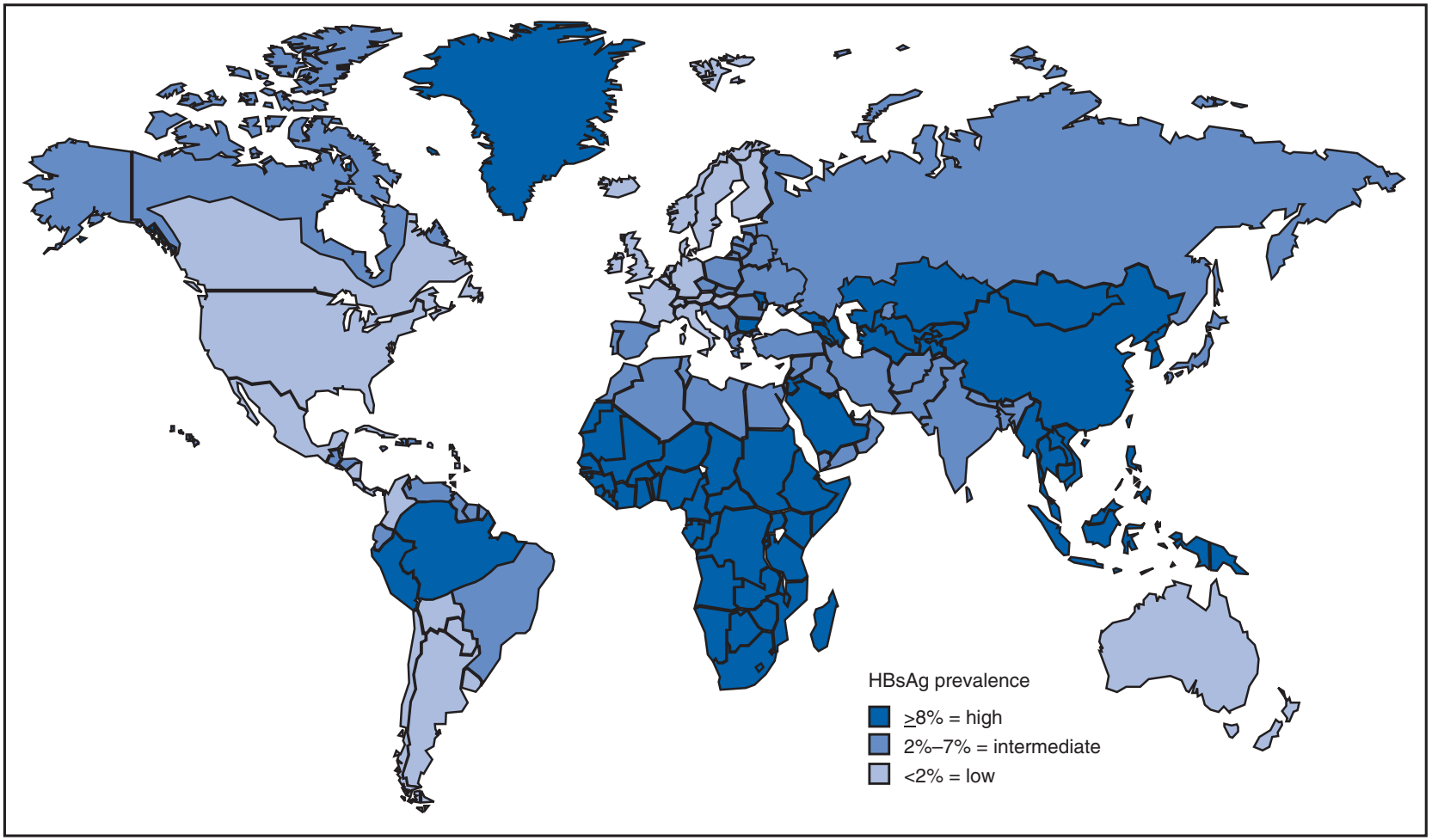
Case 2

A patient from Eritrea comes to see you for her first prenatal visit. A routine HbSAg for screening returns positive. You send liver function tests, HBeAg, anti-HBe, & HBV viral load. Her viral load is 2,000,000 IU/mL.

What is the most important risk factor for transmission to her fetus?

A. Vaginal delivery. Recommend c-section.
B. Breastfeeding. Recommend use of formula feeding.
C. High viral load. Recommend HBIG + 3 vaccine doses to infant + consider antiviral therapy for the mother.

FIGURE 3. Geographic distribution of chronic hepatitis B virus (HBV) infection — worldwide, 2006*



* For multiple countries, estimates of prevalence of hepatitis B surface antigen (HBsAg), a marker of chronic HBV infection, are based on limited data and might not reflect current prevalence in countries that have implemented childhood hepatitis B vaccination. In addition, HBsAg prevalence might vary within countries by subpopulation and locality.

Source: CDC. Travelers' health; yellow book. Atlanta, GA: US Department of Health and Human Services, CDC; 2008. Available at http://wwwn.cdc.gov/travel/yellowbookch4-HepB.aspx.

Seattle Children's
HOSPITAL • RESEARCH • FOUNDATION
UW Medicine
UW SCHOOL OF MEDICINE

Case 2

- Perinatal HBV transmission w/o prophylaxis: 90%; transmission occurs at exposure to secretions in birth canal
- Birth dose of vaccine is “post-exposure prophylaxis” against maternal secretions in birth canal
- Breastfeeding and vaginal delivery are not contraindicated
- For HbSAg + mothers, give HBIG and 3 vaccine doses
- For mothers with high viral load (>200,000 to 2,000,000 IU/mL), would consider lamivudine, telbivudine or tenofovir starting at 28-30 weeks of pregnancy

Case 3

A pregnant woman in her third trimester presents in February with fever to 38.5^{o} C, headache, and myalgias. Her fever has persisted for five days. You perform a rapid antigen test and this was negative. What is the most appropriate management?

A. The antigen test is negative – she has a viral illness but it is not influenza. Nothing to do but rest and fluids.
B. It is more than 48 hours since her symptoms started and she will not benefit from oseltamivir. Nothing to do.
C. She is pregnant and at high risk for severe outcomes. Start oseltamivir.

© drubig-photo - Fotolia.com

Case 3

What are the complications of this infection?

- Influenza pneumonia
- Bacterial pneumonia (strep, staph, h. flu)
- Myositis, CNS disease, cardiac disease – MI, myocarditis

What antivirals would you use? When would you initiate treatment?

- Influenza antigen tests are not sensitive.
- If you have clinical suspicion, start oseltamivir without waiting for the result, and do not stop if antigen test is negative.
- Initiate treatment even after 48 hours
  - Oseltamivir 75 mg bid x 5 days
  - Greatest benefit in reduction of fever or symptom duration < 12 hours after sx onset (Aoki, AAC, 2003)

Outline

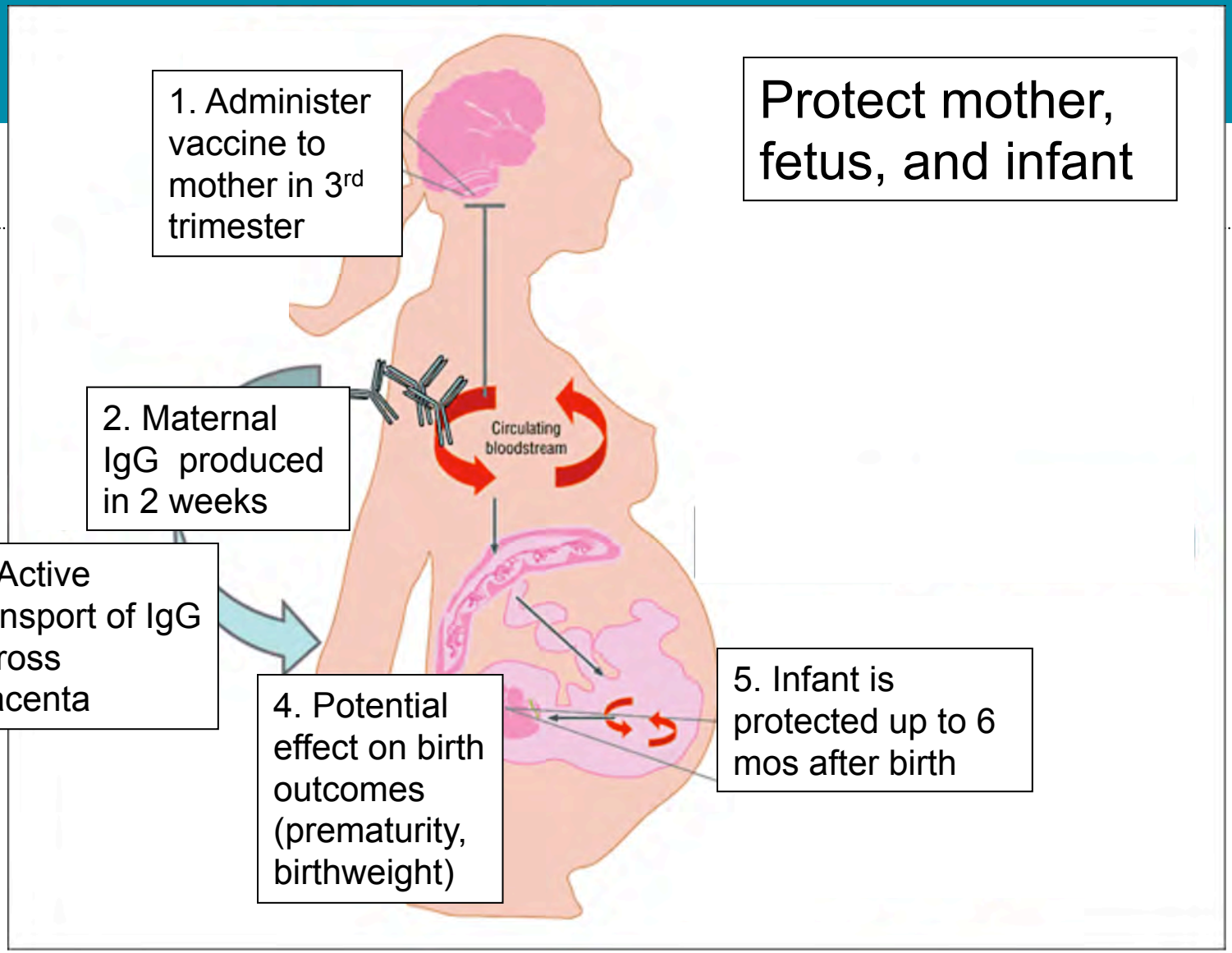
1. Management of potential exposures during pregnancy
   - Varicella zoster virus (Chickenpox)
   - Hepatitis B
   - Influenza

2. Currently Recommended Vaccines in Pregnancy
   - Influenza
   - Pertussis

Seattle Children's
HOSPITAL • RESEARCH • FOUNDATION
UW Medicine
UW SCHOOL OF MEDICINE

Vaccines During Pregnancy: True or False

- Live flu vaccines cannot be administered to pregnant women
  - TRUE: There is a theoretical risk of transmission to the fetus with all live vaccines. Pregnant women should receive the inactivated vaccine.
- Influenza vaccine is contraindicated in patients with hives due to an egg allergy
  - FALSE: All flu vaccines are prepared with inoculation of virus into chicken eggs and contain ovoalbumin. Only patients with true anaphylaxis are contraindicated from receiving flu vaccine
- Flu vaccine is linked to Guilliam Barre syndrome
  - FALSE: No association has been established
  - 750 people per million are hospitalized annually due to influenza



Seattle Children's HOSPITAL • RESEARCH • FOUNDATION

UW Medicine UW SCHOOL OF MEDICINE

Chu & Englund, CID 2014

Case 4: Vaccines During Pregnancy

- 30 yo F G2P1 presents to you for a routine visit at 32 weeks gestation. She recalled receiving her tetanus booster during her last pregnancy 2 years ago. It is currently October. What vaccines are currently recommended for her?
  A. Influenza, Tdap (tetanus, diphtheria, acellular pertussis).
  B. Influenza. She already received her Tdap within the last 5 years.
  C. None

WHEN TO IMMUNIZE A PREGNANT WOMAN?

Influenza in Pregnancy

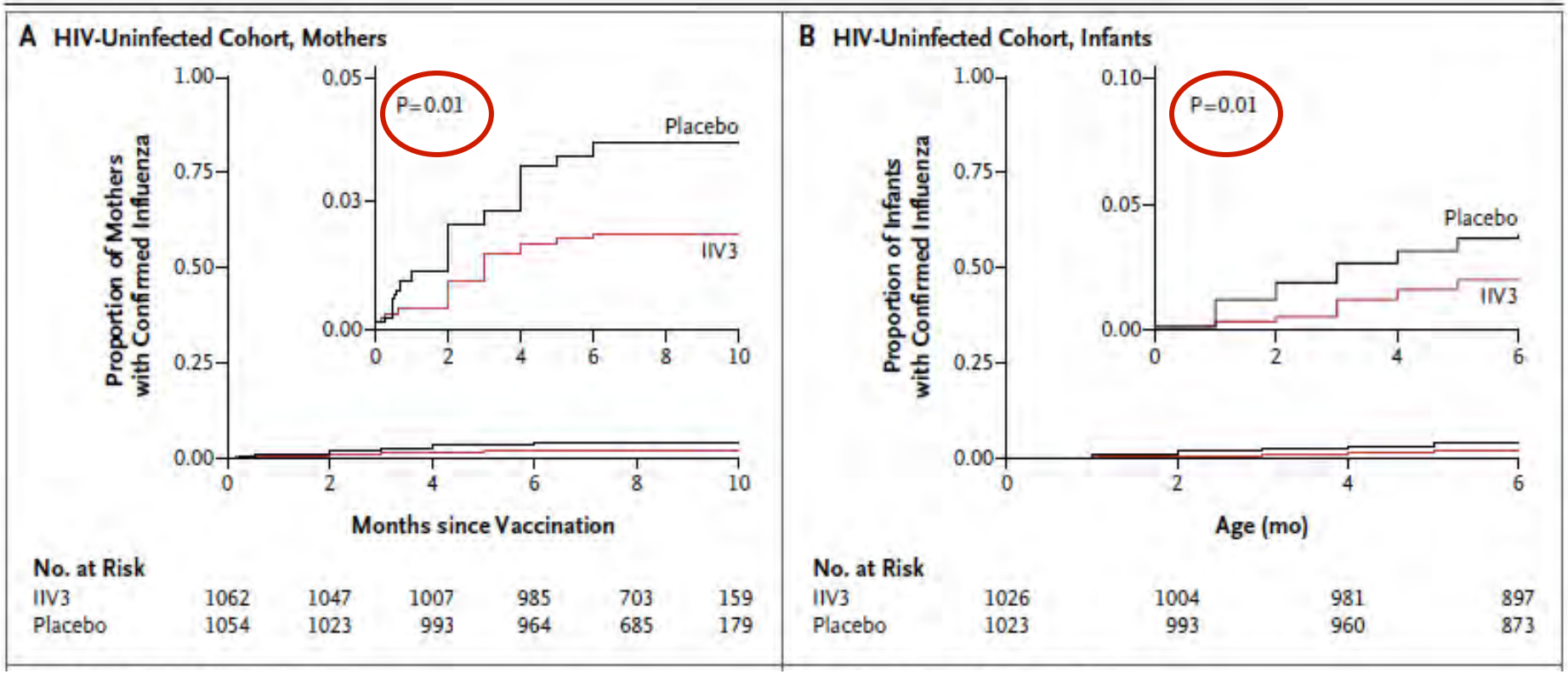
- Pregnant women are at increased risk for hospitalization and death due to influenza compared to non-pregnant adults
  - 5% of deaths due to H1N1 (1% of general population)
  - 23% of those hospitalized were in the intensive care unit
  - Among deaths, 2/3 in the third trimester
- Recommendation: Immunize any time during flu season

Siston, JAMA 2010

Seattle Children's HOSPITAL • RESEARCH • FOUNDATION

UW Medicine UW SCHOOL OF MEDICINE

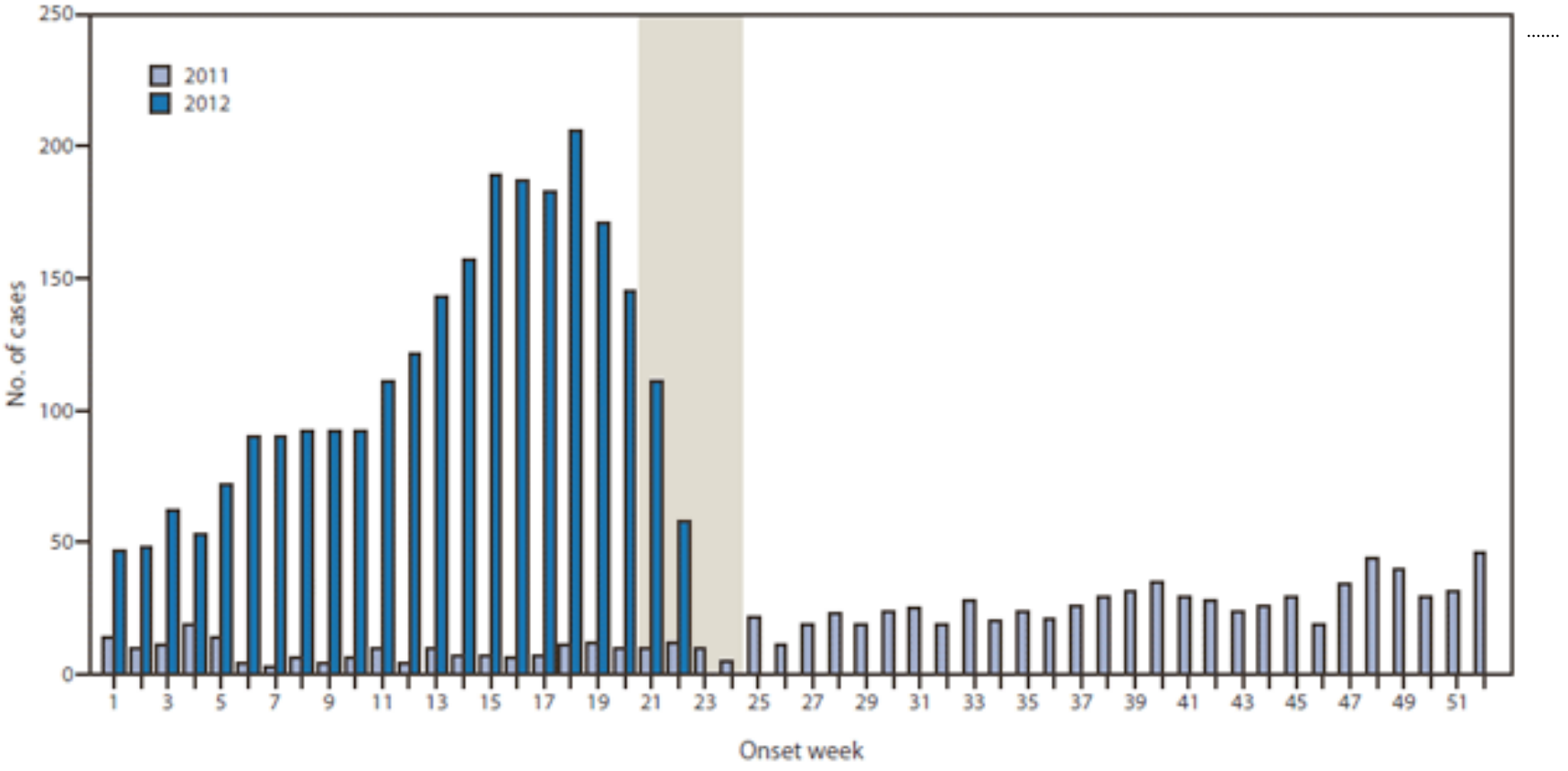
Protection of Pregnant Women and Infants with Maternal Flu Vaccine- South Africa (Madhi et al, NEJM 2014)



Seattle Children's HOSPITAL • RESEARCH • FOUNDATION

UW Medicine UW SCHOOL OF MEDICINE

Pertussis Outbreak in Washington State: 2012



Seattle Children's
HOSPITAL • RESEARCH • FOUNDATION

UW Medicine
UW SCHOOL OF MEDICINE

Health | Local News

Whooping-cough cases rise sharply in Washington state

Originally published April 28, 2015 at 7:22 pm | *Updated April 29, 2015 at 6:37 pm*

Nearly 400 cases of pertussis, or whooping cough, have bee in Washington state so far this year, compared with 85 a ye

November 13, 2014 at 8:24 PM

Whooping-cough outbreak at Seattle's Roosevelt High

Posted by Leah Todd

Thirteen students at Seattle's Roo whooping-cough since mid-Octob

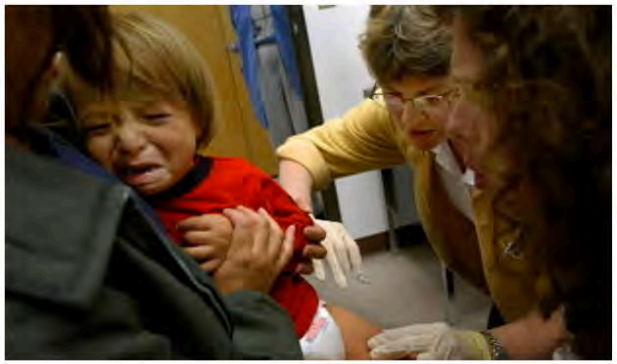
What's Behind Washington's Whooping Cough Spike?

By RUBY DE LUNA • MAY 5, 2015

SHARE
Twitter
Facebook
Google+
Email

a Guillen, left, and Fran Wendt, right, give Kimberly Magdeleno, 4, a Tdap whooping cough booster

Washington state whooping cough epidemic worsens



Whooping cough reached epidemic levels in Washington state in 2012, prompting a call for vaccinations. The epidemic has returned in 2015. *(Michael Lloyd/The Oregonian/file)*

By Kelly House | The Oregonian/OregonLive
Email the author | Follow on Twitter
on April 29, 2015 at 3:15 PM, updated April 29, 2015 at 3:52 PM

Print
Email

SPONSORED CONTENT

Preparing Today's Stu Tomorrow's Workforc
presented by Saturday Aca affiliation with University

High School Internships Push for More Dedicate on STEM Fields.

- Interest from female studer STEM fields has increased
- More internship opportuniti needed from Science and M

le Children's
RESEARCH • FOUNDATION

UW Medicine
UW SCHOOL OF MEDICINE

Why are we having an epidemic in Washington State?

- Acellular vaccine is not as good as previous whole cell vaccine (but less side effects & less blunting of infant vaccines)
- Vaccine efficacy wanes over time
  - Efficacy at one year: 73%
  - Efficacy at 2-4 years: 34%
- Vaccine refusal – Measles outbreak at Disneyland

Seattle Children's HOSPITAL • RESEARCH • FOUNDATION

UW Medicine UW SCHOOL OF MEDICINE

Acosta, Pediatrics 2015

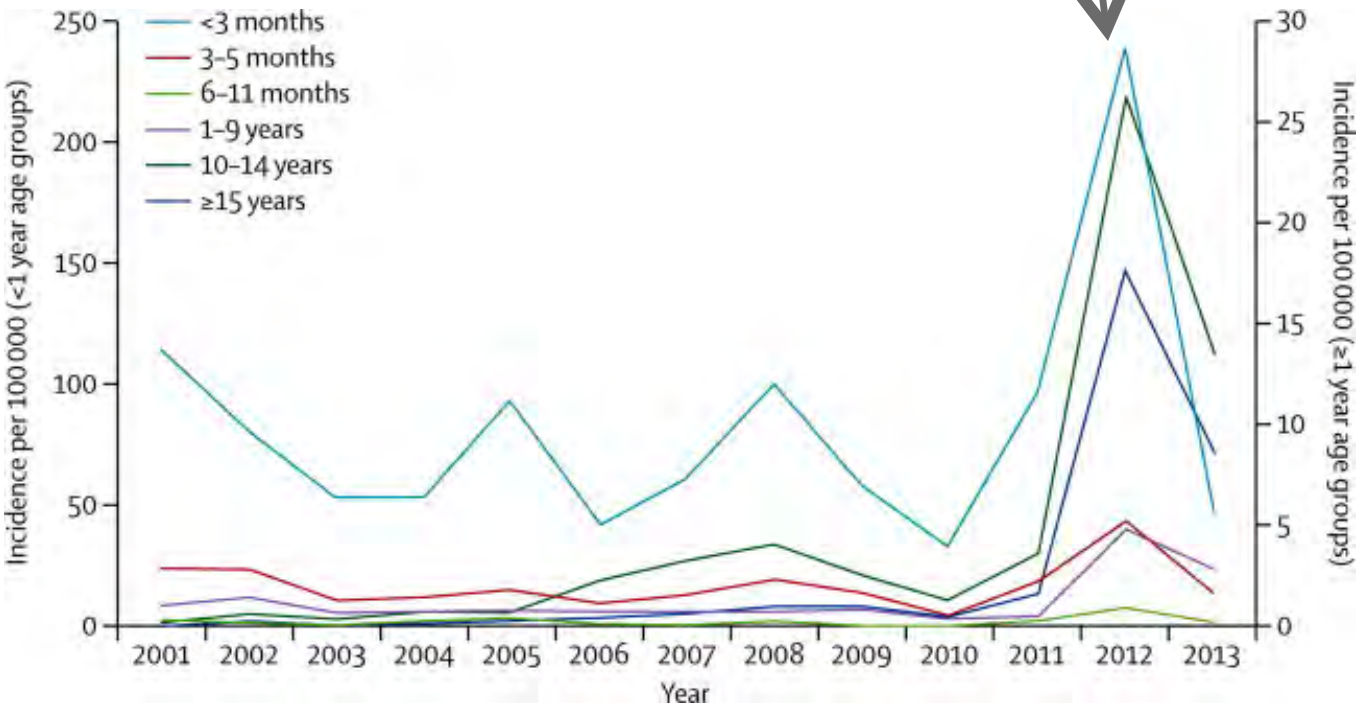
Pertussis Morbidity and Mortality

- 30-40% of infants get pertussis from their mother
- Highest mortality from pertussis under 6 months of age
  - 50% of infants with RSV < 1 year of age are hospitalized
  - 23% pneumonia; 1.6% die
- First infant vaccine at 2 months of age

ACIP recommends: TDAP DURING EVERY PREGNANCY IN THE THIRD TRIMESTER

EXAMPLE: UK Maternal Tdap Immunization*

Maternal Pertussis Vx
Introduced Oct. 2012



*Amirthalingam G et al. Effectiveness of maternal pertussis vaccination in England: an observational study. Lancet 2014; 384:1521

Take home points

- Exposure to varicella during pregnancy – check IgG
- Hepatitis B transmission risk increases with high viral load
- Oseltamivir can be started in a pregnant woman with flu-like symptoms at any time
- No live vaccines during pregnancy
- Influenza vaccines given in pregnancy prevent flu in mothers and babies
- Give Tdap in the third trimester, flu vaccine anytime
- Call us with your questions: UW MedCon - **800.326.5300**