



Pertussis (Whooping Cough) in Mississippi

Key Messages:

1. **Pertussis cases are on the rise nationwide due to lapses in vaccination and waning immunity.**
2. **Pertussis is particularly dangerous for children less than 1 year of age, frequently resulting in hospitalization and at times seizures, neurologic injury, and death.**
3. **Immunization is the best protection against pertussis. In order to protect newborns, it is currently recommended that pregnant women receive one Tdap between 27 and 36 weeks gestation with every pregnancy. “Cocooning,” immunization of all close relatives of newborns, is an additional recommended strategy.**

Epidemiology:

The United States has witnessed a marked increase in pertussis over the last 8 years. 48,277 cases of pertussis were reported to the CDC nationwide in 2012, representing the largest number of reported cases since 1955. Of the cases in the 2012 year, 20 resulted in deaths, 75% of which were in infants younger than 3 months. Although the overall number of reported cases in the US declined in 2013 (24,231), 13 states and Washington D.C. reported increased rates of pertussis. As of July 11, 2014, the U.S. has seen a similar number of pertussis cases as was seen during the 2013 year (provisional data). Within the last 10 years large outbreaks of pertussis have occurred in California, Delaware, and Washington, driven in part by a lack of protective vaccination and waning immunity. A 2005 outbreak in Delaware in a largely unvaccinated Amish community led to 345 cases among preschool-aged children. In 2012 an outbreak in Washington caused a 1300% increase in cases from the same time period in 2011. This was the highest number of reported cases in the state since 1942.

Although the number of cases in Mississippi has been relatively stable in comparison with national trends (Figure), as of July 21st Mississippi has witnessed a slight increase in reported cases in 2014 (45) compared to this point in 2013 (33). Of the cases reported thus far in 2014, 29% were associated with a cluster of infections spread among household contacts and 9% were associated with a multistate outbreak. 42% (19) of the 2014 cases have been among infants between the ages of 0 and 23 months of age, 63% of which were hospitalized with no reported deaths thus far. Pertussis is highly pathogenic among infants less than 1 year of age, leading to hospitalization in approximately 50%, of which 23% develop pneumonia and 1.6% die. Mississippi experienced infant deaths due to pertussis in both 2008 and 2012, neither of whom had been vaccinated.

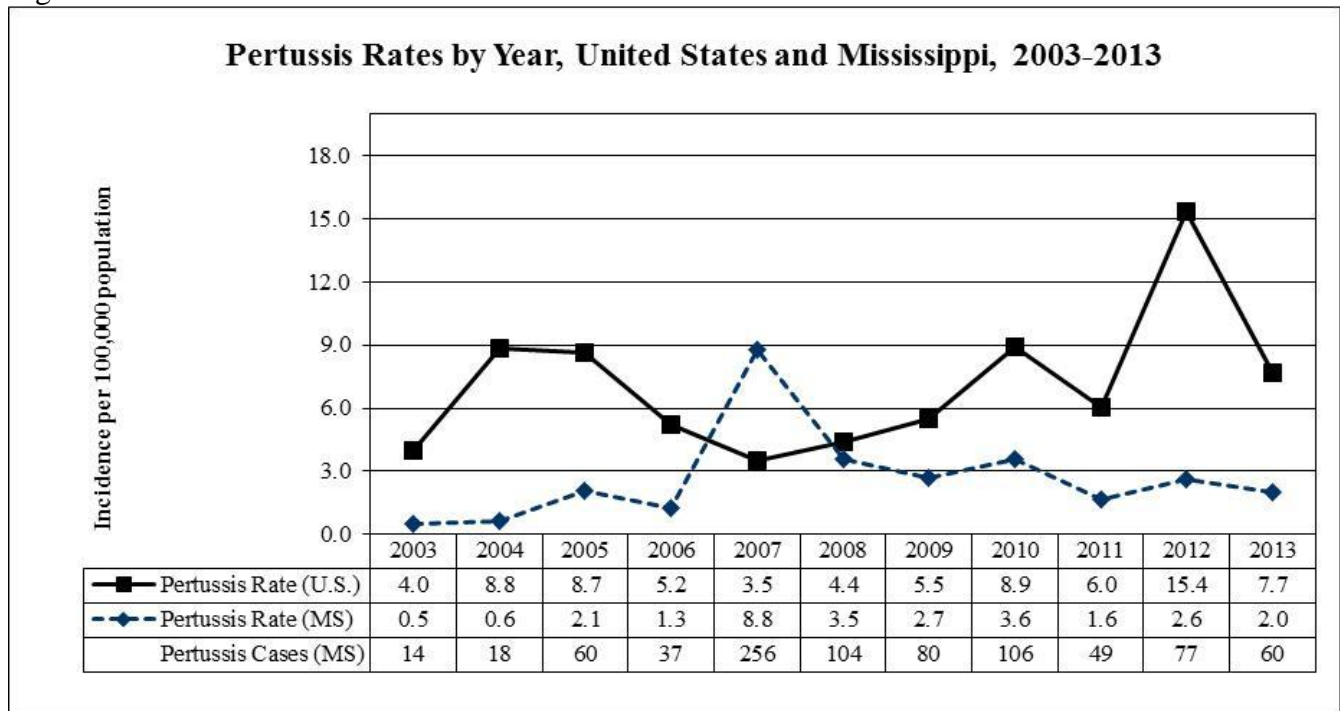
Clinical Presentation, Diagnosis and Treatment:

Pertussis, a highly contagious respiratory illness caused by the bacterium *Bordetella pertussis*, is spread through coughing or sneezing while in close contact with individuals who then breathe in the bacteria. The symptoms of pertussis generally develop within 7-10 days of exposure. Early symptoms (Stage 1) of the illness include runny nose, low-grade fever, mild, occasional cough, and apnea in infants. Individuals are most contagious from the beginning of the first stage through the third week of cough. Stage 2 lasts from 1-6 weeks and is defined by numerous coughs followed by a “whoop” sound,

vomiting, and exhaustion. Infected adults generally have milder symptoms with a chronic hacking cough, often without paroxysms or posttussive vomiting. Although adults do not experience pertussis to the same degree, they can still spread the infection on to susceptible infants.

Pertussis should be suspected in individuals with a cough lasting two weeks or more and paroxysms of coughing, posttussive vomiting, inspiratory “whoop” or apnea (only present in infants under one year old). Pertussis should also be suspected among contacts of known cases that develop respiratory symptoms. Pertussis DNA by PCR of nasopharyngeal specimens is the preferred method of diagnosis. Serology is generally not helpful except among previously unvaccinated suspects. Macrolide antibiotics (erythromycin, clarithromycin, or azithromycin) are recommended for the treatment of pertussis, and individuals are generally no longer contagious after 5 days of treatment. The early use of antibiotics can substantially lessen the severity of the infection. It is important to note that after three weeks the bacteria are generally no longer in the patient’s system; therefore antibiotics may not be as useful at this point.

Figure



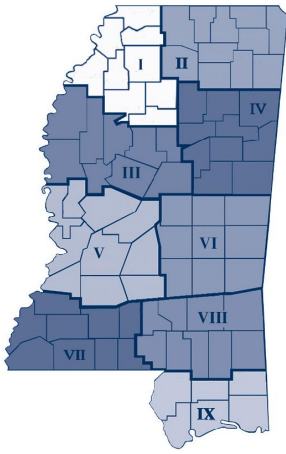
Prevention:

Immunization against pertussis is the most effective way to prevent illness and subsequent spread. The current recommendation for children is to receive 5 doses of DTaP between the ages of 2 months and 6 years. Efficacy in children with 1-2 doses of the vaccine is less than 75%, after 3 doses efficacy is only 80%. It is not until the 4th dose, or the booster, that efficacy in children reaches 95%. Due to waning immunity after 5-10 years (efficacy of less than 75%) a booster Tdap is required for adolescents and adults. Due to this effect, it is currently required that all children entering the 7th grade in Mississippi receive this additional dose of Tdap. For adults, revaccination is recommended after 19 years of age. (Please see <http://www.cdc.gov/vaccines/schedules> for additional guidance). For 2012 the Mississippi pertussis immunization rate for children 19 – 35 months of age slightly exceeded the national average, with 83.6% receiving 4 doses of DTaP vs. 82.5% nationally. For adolescents (aged 13-17 years) however, Mississippi trailed the national average significantly with only 53.5% receiving the adolescent booster doses vs. 84.6% nationally.

Mississippi

Provisional Reportable Disease Statistics

June 2014



		Public Health District									State Totals*			
		I	II	III	IV	V	VI	VII	VIII	IX	June 2014	June 2013	YTD 2014	YTD 2013
Sexually Transmitted Diseases	Primary & Secondary Syphilis	0	0	0	0	2	0	1	5	2	10	†	57	†
	Early Latent Syphilis	2	3	10	1	12	0	0	1	6	35	†	134	†
	Gonorrhea	24	44	51	42	152	27	41	51	72	504	†	2335	†
	Chlamydia	153	158	218	160	457	129	121	138	163	1697	†	8242	†
	HIV Disease	8	2	5	3	13	2	2	5	6	46	†	260	†
Mycobacterial Diseases	Pulmonary Tuberculosis (TB)	1	1	0	0	2	0	1	1	1	7	6	30	37
	Extrapulmonary TB	0	0	0	0	0	0	0	0	0	0	1	2	1
	Mycobacteria Other Than TB	4	2	2	1	10	3	2	3	8	35	29	202	193
Vaccine Preventable Diseases	Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	0	3	0	0	1	2	1	0	0	7	2	41	28
	Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0	0
	Measles	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mumps	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hepatitis B (acute)	0	0	0	0	0	0	0	2	0	2	6	19	29
	Invasive <i>H. influenzae</i> disease	0	0	0	0	0	1	0	0	0	1	4	14	17
	Invasive Meningococcal disease	0	0	0	0	0	0	0	0	0	0	0	0	2
Enteric Diseases	Hepatitis A (acute)	0	0	0	0	0	0	0	0	0	0	0	1	1
	Salmonellosis	9	9	3	5	17	6	2	4	7	64	91	227	271
	Shigellosis	1	2	1	1	10	1	0	1	1	18	21	120	77
	Campylobacteriosis	1	2	0	0	0	1	0	0	3	7	7	39	49
	<i>E. coli</i> O157:H7/STEC/HUS	0	0	0	0	0	1	0	0	1	2	7	9	16
Zoonotic Diseases	Animal Rabies (bats)	0	0	0	0	0	0	0	0	0	0	0	0	1
	Lyme disease	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rocky Mountain spotted fever	0	0	0	0	0	0	0	0	0	0	6	4	15
	West Nile virus	0	0	0	0	0	0	0	0	0	0	5	2	6

*Totals include reports from Department of Corrections and those not reported from a specific District.

†Data not available.

Due to the high risk of hospitalization, pneumonia, and death among infants acquiring pertussis, special considerations are required to protect this group. Immunization during pregnancy is a key strategy that is markedly underutilized in Mississippi. Since October 2012 the Advisory Committee on Immunization Practices has recommended that women receive a dose of Tdap with each pregnancy between 27 and 36 weeks gestation to maximize passive protective antibody transfer to the newborn. The Mississippi State Department of Health (MSDH) as well as the American College of Obstetricians and Gynecologists support this recommendation. Ensuring that close contacts to newborns are up to date on pertussis immunization is an additional CDC promoted strategy known as “cocooning”.

Due to the resurgence of pertussis and the high morbidity among young children, MSDH is promoting enhanced immunization coverage in accordance with current guidelines for children, adolescents, adults and pregnant women. As Tdap immunization coverage is not available from all insurance carriers, Tdap vaccine is being made available by MSDH free of charge, aside from a small administration fee, at all county health departments to un-insured or under-insured pregnant women as a part of CDC’s 317 special initiative immunization program. For specifics about how to get immunized, please contact your local county health department.

Submitted by: Tori Bethay, Jannifer Anderson, RN and Thomas Dobbs, MD, MPH
References on request.