



Recent Increases in Hib Disease

Prior to the development and widespread use of *Haemophilus influenzae* (Hib) type b conjugate vaccines in the late 1980's and early 1990's, Hib was the most common cause of bacterial meningitis in children less than 5 years of age. Since implementation of the Hib conjugate vaccine immunization program in the United States in the early 1990s, the incidence of Hib disease has declined from a peak of 41 cases per 100,000 children aged <5 years in 1987 to approximately 0.11 cases per 100,000 in 2007.

In Mississippi, conjugate vaccine was first offered to 18 month olds in 1989, to 15 month olds in 1990, and as a primary series, starting at 2 months of age, with a 12-15 month booster, in January 1991. With the institution of vaccination, the number of reported cases dropped from 82 in 1989, to 5 by 1994. There have been <5 cases per year since 1995, with none reported in 2007. In 2008, there were four reported cases, one in a child <5 years of age. The child was 9 months old and had not completed the primary Hib series.

An ongoing shortage of Hib-containing vaccines, which began in December 2007, has led to CDC recommendations to defer the 12-15 month booster dose, while emphasizing the importance of completion of the primary series. It is suggested that this shortage may be contributing to increased carriage rates, thus impacting overall population immunity. The following report, adapted from a recent CDC MMWR, describes 5 cases of invasive Hib disease in Minnesota, and discusses the impact of parent or guardian refusal or deferral of vaccinations and the Hib-containing vaccine shortage. The full report can be accessed at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm58e0123a1.htm>.

Invasive *Haemophilus influenzae* Type B Disease in Five Young Children --- Minnesota, 2008

In 2008, five children aged <5 years were reported to the Minnesota Department of Health (MDH) with invasive *Haemophilus influenzae* type b (Hib) disease; one died. Only one of the children had completed the primary Hib immunization series; three had received no doses of Hib-containing vaccine. The cases occurred during a Hib vaccine recall and continuing nationwide shortage that began in December 2007. The recall of certain lots of the two Hib-containing vaccines manufactured by Merck & Co., Inc. (West Point, Pennsylvania) and cessation of production of both vaccines left only one manufacturer of Hib vaccine in the United States (Sanofi Pasteur, Swiftwater, Pennsylvania). In response, CDC recommended that health-care providers defer the routine 12--15 month booster dose for children not at increased risk for Hib disease. CDC also emphasized that all children should complete the primary series with available Hib-containing vaccines. However, Minnesota vaccination data indicate that primary Hib series coverage was lower during 2008 than coverage with other vaccines administered at the same ages and lower than Hib coverage in previous years. The increase highlights the need to ensure that all children complete the primary Hib immunization series.

Merck products are Hib PRP-OMP vaccines, for which a primary series consists of 2 doses at 2 and 4 months. Sanofi Pasteur products are Hib PRP-T vaccines, for which a primary series consists of a 3-dose primary series at 2, 4, and 6 months. For both Hib vaccine series, a routine booster is recommended at age 12--15 months.

During 2008 in Minnesota, five children aged 5 months to 3 years were reported with invasive Hib disease; one died (Table). The patients resided in five different counties in Minnesota and had no known

relationship to each other. Three patients had received no vaccinations because of parent or guardian deferral or refusal. One child was aged 5 months and had received 2 doses of Hib PRP-T vaccine in accordance with the primary series schedule. Another child had received 2 doses of Hib PRP-OMP vaccine, but no booster dose, per CDC recommendations during the shortage. Subsequent to Hib infection, this child was diagnosed with hypogammaglobulinemia. None of the five were enrolled in group child care. The five cases in 2008 were the most reported for 1 year from Minnesota since 1992, when 10 cases were reported.

TABLE. Characteristics of five reported cases of invasive *Haemophilus influenzae* type b (Hib) disease* in persons aged <5 years — Minnesota, 2008

Patient	Month of illness onset	Patient age at illness onset	Clinical syndrome [†]	Outcome	Hib vaccination status
1	January	15 mos	Meningitis	Survived	2 doses at 2 and 5 months (PRP-OMP) [§]
2	February	3 yrs	Pneumonia	Survived	0 doses
3	November	7 mos	Meningitis	Died	0 doses
4	November	5 mos	Meningitis	Survived	2 doses at 2 and 4 months (PRP-TT) [¶]
5	December	20 mos	Epiglottitis	Survived	0 doses

* Defined as isolation of *H. influenzae* from a normally sterile site in a Minnesota resident.

[†] One patient had meningitis with subdural abscess.

[§] Hib vaccine, capsular polysaccharide polyribosomal phosphate (PRP)-outer membrane protein (OMP), 2-dose primary series.

[¶] Hib vaccine, PRP-tetanus toxoid, 3-dose primary series.

Although the recall and cessation of production of Merck Hib-containing vaccines in December 2007 resulted in a nationwide Hib vaccine shortage, supply of the remaining two products manufactured by Sanofi Pasteur is adequate for all infants to complete the 3-dose primary vaccine series. However, in February 2008 the Minnesota Vaccines for Children program began receiving reports from vaccine providers regarding shortages of vaccine in their offices. On January 13, MDH examined 2008 vaccination coverage data in the Minnesota Immunization Information Connection (MIIC), Minnesota's immunization registry. Data were reviewed for 25,699 children born between November 1, 2007 and March 31, 2008 (Figure). Among children aged 7 months, 3-dose primary Hib series coverage was 46.5%, which is lower than the age-appropriate coverage for children who had received pneumococcal conjugate or diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccination. In contrast, data from the 2007 National Immunization Survey, conducted prior to the shortage, showed that Hib vaccination coverage among children in Minnesota aged 19 months to 35 months was high and did not differ from the national average, suggesting that coverage has declined as a result of the shortage.

Given the prolonged booster dose deferral and reduced primary series coverage in the state, the increase in the number of Hib cases likely reflects increasing carriage and transmission affecting those with suboptimal primary series vaccination coverage, or a weakening of herd immunity. None of the children failed to receive vaccine because of the vaccine shortage.

While the shortage continues, completion of the primary series in all children is essential to safeguard individual protection as well as to strengthen herd immunity.

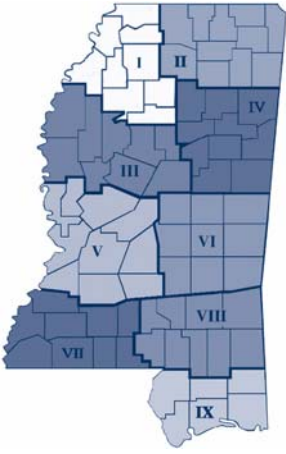
Reference:

CDC. Invasive *Haemophilus influenzae* type b disease in five young children—Minnesota, 2008. MMWR January 2009; 58(03);58-60.

Mississippi

Provisional Reportable Disease Statistics

January 2009



		Public Health District									State Totals*			
		I	II	III	IV	V	VI	VII	VIII	IX	Jan 2009	Jan 2008	YTD 2009	YTD 2008
Sexually Transmitted Diseases	Primary & Secondary Syphilis	0	1	0	0	2	0	0	1	2	6	6	6	6
	Total Early Syphilis	2	4	2	0	7	0	1	3	3	22	17	22	17
	Gonorrhea	42	53	83	40	174	72	42	63	50	619	673	619	673
	Chlamydia	194	148	288	122	543	163	141	161	129	1,889	1,791	1,889	1,791
	HIV Disease	7	4	4	3	20	2	3	3	8	54	60	54	60
Mycobacterial Diseases	Pulmonary Tuberculosis (TB)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Extrapulmonary TB	0	0	0	0	0	0	0	0	0	0	1	0	1
	Mycobacteria Other Than TB	0	1	0	2	10	1	3	1	5	23	29	23	29
Vaccine Preventable Diseases	Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	0	1	3	1	0	1	0	0	1	7	15	7	15
	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	3	0	0	3	0	0	0	0	6	2	6	2
	Invasive <i>H. influenzae</i> b disease	0	0	0	0	0	0	0	0	0	0	0	0	0
	Invasive Meningococcal disease	0	0	0	0	0	0	0	0	0	0	0	0	0
Enteric Diseases	Hepatitis A (acute)	0	0	0	0	0	0	1	1	0	2	0	2	0
	Salmonellosis	3	5	0	3	7	2	3	6	6	35	39	35	39
	Shigellosis	1	0	0	2	0	1	0	0	0	4	69	4	69
	Campylobacteriosis	1	1	2	1	1	3	2	1	1	13	9	13	9
	<i>E. coli</i> O157:H7/HUS	0	1	0	0	0	0	0	0	0	1	1	1	1
Zoonotic Diseases	Animal Rabies (bats)	0	0	0	0	0	0	0	0	0	0	1	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	0	0	0
	West Nile virus	0	0	0	0	0	0	0	0	0	0	0	0	0

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

MS School Entry Immunization Requirements 2009-2010^a

The list of immunizations required is specified by the State Health Officer and is promulgated at least annually as directed by state statute. All vaccines are to be given at the appropriate age and intervals according to ACIP recommendations. The required vaccines are listed below.

Vaccine/antigen	No. of doses
Diphtheria, Tetanus, Pertussis (DTaP) ^b	5 ^c
Polio (IPV)	4 ^d
Hepatitis B	3
Measles, Mumps, Rubella (MMR)	2 ^e
Varicella (chickenpox)	2 ^f

a-All children entering a Mississippi school (any grade) for the first time will be required to have the above listed immunizations. **(This includes Pre-K 4 year olds – 12th grade).**

b-Children entering a Mississippi school after their 7th birthday, not meeting the above DTaP requirements will need at least 3 total doses of diphtheria/tetanus containing vaccine (Td). Tdap should be used as one of the three diphtheria/tetanus containing vaccines (preferably as the first of the 3 doses) for children age 10 years and older.

c-If the 4th dose is received on or after the 4th birthday, a 5th dose is not required.

d-If the 3rd dose is given on or after the 4th birthday, a 4th dose is not required.

e-Documented physician's diagnosis of previous infection with measles, mumps and rubella disease only or serological confirmation of immunity to measles, mumps and rubella will be allowed.

f-Beginning 2009-2010 school year, all children entering school for the first time will be required to have 2 doses of the varicella-containing vaccine or a history of typical varicella. If there is a history of chickenpox, the vaccine is not required.