



# Mississippi Morbidity Report

## *Resurgence of Measles in the US—Guidance for Mississippi Healthcare Providers*

### Key Messages:

- **Due to under-immunization for measles in subsets of the U.S. population and the introduction of measles from endemic countries, the U.S. is experiencing a resurgence of measles cases.**
- **The measles vaccine is highly effective. Mississippians without a history of immunity or complete vaccination should be given appropriate doses of the MMR vaccine.**
- **Mississippi providers should suspect measles among febrile patients with the characteristic rash and consistent prodrome.**

**Introduction:** Measles was declared eliminated from the US in 2000 due to a highly effective vaccination program which led to the interruption of continuous endemic transmission. Since 2000, the number of cases reported yearly in the US has ranged from a low of 37 in 2004 to a high of 644 cases in 2014. In 2014 there were 23 reported measles outbreaks including one large outbreak of 383 cases occurring primarily among an unvaccinated Amish communities in Ohio. In 2015 there are already 170 cases of measles reported in the US (as of February 27) with 3 outbreaks accounting for 90% of the cases (see <http://www.cdc.gov/measles/cases-outbreaks.html> for up to date case counts). The largest of those is an ongoing multi-state outbreak with 140 cases reported from 7 states from December 28, 2014 through February 27, 2015. These cases are linked to exposures at an amusement park in California (see <http://www.cdc.gov/measles/multi-state-outbreak.html> for the latest outbreak information). The source of the outbreak has not been identified, but it likely started when a traveler infected with measles abroad visited the park while infectious. **There are no cases associated with this outbreak in Mississippi (see Mississippi Epidemiology below).**

According to a recent Centers for Disease Control and Prevention (CDC) report, of 110 cases in California residents linked to the outbreak, 45% have occurred among unvaccinated individuals, and 43% have occurred in persons with unknown or undocumented vaccination status. The full CDC report is available at [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6406a5.htm?s\\_cid=mm6406a5\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6406a5.htm?s_cid=mm6406a5_w).

Measles outbreaks as a result of imported cases, largely among unvaccinated populations, have become more frequent in the US in recent years. High measles vaccine coverage, clinician awareness and a rapid and appropriate public health response are critical components for the prevention and control of measles cases in the US and Mississippi. What follows is a discussion of the clinical presentation, the epidemiology of measles in both the US and Mississippi and guidance for providers when measles is suspected.

**Clinical Presentation:** Measles is a highly contagious viral illness spread person to person through airborne respiratory droplets. Measles is characterized by prodromal fever (as high as 105°F) and the three C's (cough, coryza and conjunctivitis), often with Koplik spots (white spots on an erythematous base on the buccal mucosa). On about the 3rd to 7th day of the illness (usually about 14 days after a person is exposed) patients develop a maculopapular rash spreading from the head to the trunk and lower extremities, becoming generalized over a 3 day period. Individuals are considered contagious from 4 days before to 4 days after the onset of rash. The incubation period ranges from 7 to 21 days.

Children <5 years of age and adults >20 years of age are at increased risk for complications. Even in previously healthy children, measles can cause serious illness requiring hospitalization. One out of every 1,000 measles cases will develop acute encephalitis and one or two out of every 1,000 children will die from respiratory and neurologic complications. Subacute sclerosing panencephalitis (SSPE) is a rare but fatal degenerative disease of the central

nervous system characterized by behavioral and intellectual deterioration and seizures that generally develop 7 to 10 years after measles infection.

**US Epidemiology:** In many parts of the world measles is still endemic or occurs in large outbreaks, primarily in Europe, Asia, Africa and the Pacific. An estimated 20 million cases and 146,000 deaths occur worldwide each year. Before the US instituted a measles vaccination program in the early 1960's, about 3-4 million people were infected each year, with up to 48,000 hospitalizations and 400-5000 deaths annually.

The importation of cases from countries where measles remains endemic has led to large outbreaks of measles in the US, primarily in communities with large groups of unvaccinated individuals. The majority of importations of measles into the US come from US residents; when vaccine status can be identified, almost all are unvaccinated. When measles gets into communities of unvaccinated people in the US (such as communities with high philosophical or personal belief exemptions), outbreaks are more likely to occur due to the loss of protective herd immunity. Herd immunity exists when a large enough proportion of a community is immune to an illness, thus preventing sustained transmission. The MMR vaccine is highly effective, eliciting measles immunity in 99% of those receiving the appropriate 2 dose series; due to the highly contagious nature of measles, maintenance of protective herd immunity requires up to 94% immunity in a population. Reduced vaccination rates in these communities can make it difficult to control the transmission of measles and leads to a concern that the virus may re-establish in this country.

**Mississippi Epidemiology:** The last time measles was reported in Mississippi was in 1992, when fifteen cases occurred as part of an outbreak occurred at the University of Mississippi resulting from a student who was exposed while traveling in Europe. Two unrelated cases were also reported that year. In 2002, a non-resident of the state was diagnosed with measles while visiting friends in Mississippi. The unvaccinated woman became infected in an endemic country in Africa; no Mississippi cases were identified as a result of the exposures.

**Immunization Recommendations:** Healthcare providers in Mississippi should ensure all patients are up to date on measles-mumps-rubella (MMR) vaccine:

- **Routine:** Children should receive two doses of MMR vaccine—the first dose at 12 to 15 months of age and the second dose 4 to 6 years of age.
- **International travelers:** prior to departure, all persons >6months of age should be protected from measles
  - Infants 6-11 months of age should receive one dose of MMR before departure (infants <12 months of age should receive 2 more doses of MMR per the routine schedule with the first dose at 12-15 months of age and the second dose by 4-6 years of age);
  - Children 12 months of age and older should have two doses of MMR at least 28 days apart prior to international travel (such children are considered fully immunized and would not be required to receive additional doses of MMR vaccine);
  - Adults and teenagers should have documentation of 2 appropriately spaced doses of MMR.
- **Healthcare workers:** should have documented evidence of immunity to measles according to the Advisory Committee on Immunization Practices (ACIP). See “Immunization of Health-Care Personnel: Recommendations of the Advisory Committee on Immunization Practices” ([www.cdc.gov/mmwr/pdf/rr/rr6007.pdf](http://www.cdc.gov/mmwr/pdf/rr/rr6007.pdf) ).

**Identifying Measles in MS:** Healthcare providers are encouraged to consider measles in any patients presenting with a febrile rash illness with a clinically compatible prodrome (cough, coryza, and conjunctivitis); especially in unvaccinated individuals with recent international travel, recent travel to domestic venues frequented by international travelers, or recent known exposure to measles. Providers should consider travel history in all patients evaluated for a febrile rash illness. See the attached algorithm for the evaluation of a measles suspect in Mississippi (Figure).

**Laboratory Diagnosis of Measles:** MSDH can provide guidance on the diagnosis and laboratory testing for measles suspects. The most commonly available methods for confirming measles infection are measles specific IgM antibody and measles RNA detection by real-time PCR (RT-PCR). All persons identified as high risk for measles infection based on clinical presentation, vaccination history and exposure/travel history should have serology for IgM and IgG drawn (see CDC Measles Serology guidance at <http://www.cdc.gov/measles/lab-tools/serology.html>). Clinicians may call MSDH for guidance on the need to test individuals identified as low risk

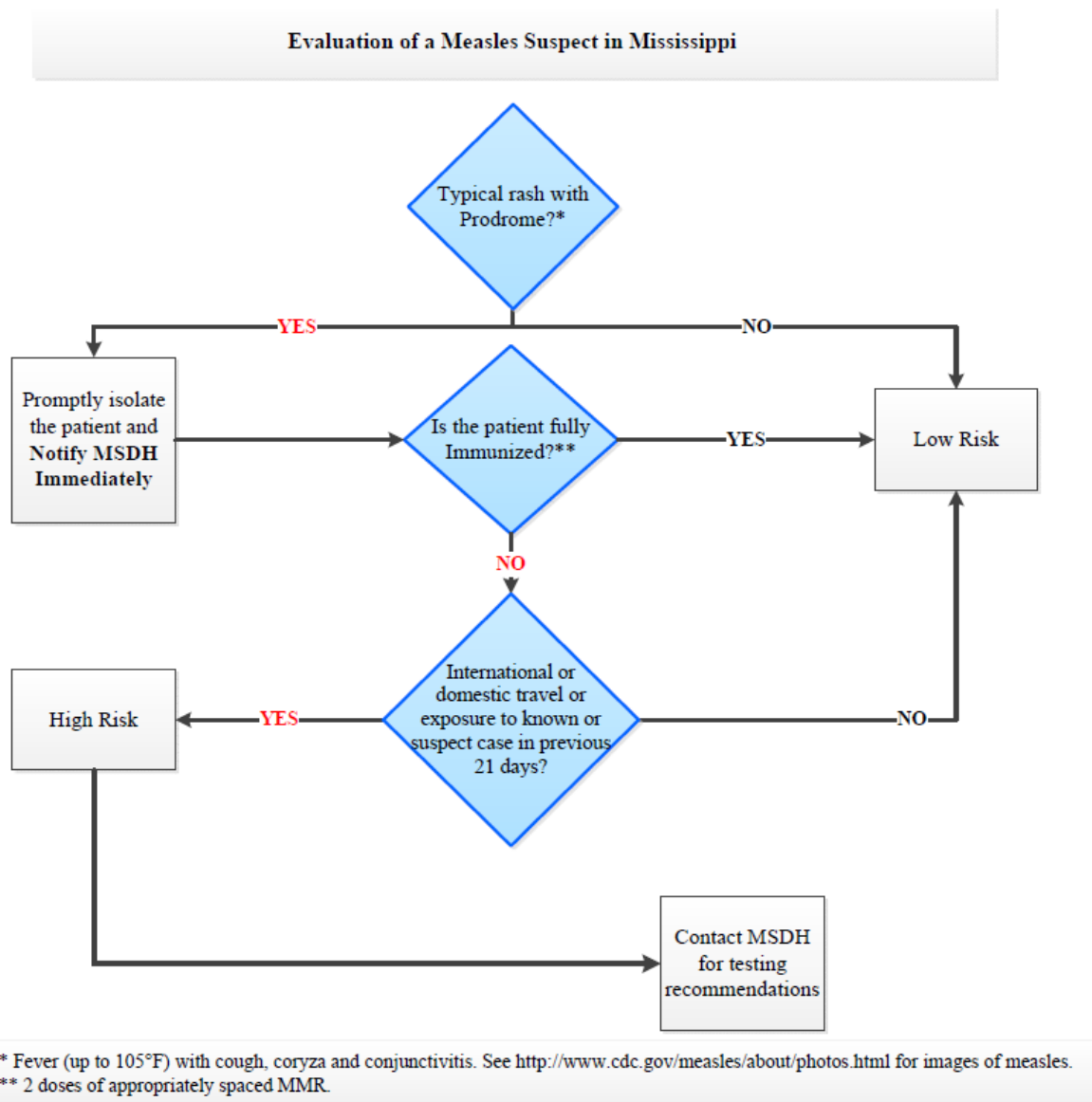
based on the provided algorithm. Detection of measles specific IgM within the first few days of rash onset can provide presumptive evidence of current or recent measles infection. Samples should be taken >4 days after onset of the rash. The following provides guidelines for the interpretation of measles serology.

### Guideline for Interpreting Measles Serology

Measles IgM	Measles IgG	Interpretation
IgM -	IgG -	No evidence of infection, no evidence of immunity
<b>IgM +</b>	<b>IgG-</b>	<b>Presumptive Measles infection</b>
IgM+	IgG+	Recent infection or immunization
IgM -	IgG +	Immunity to measles, no evidence of infection

Measles is a Class 1 reportable condition in Mississippi requiring immediate reporting to MSDH within 24 hours at first knowledge or suspicion. To report a suspected or confirmed case, call 601-576-7725 during regular business hours or 601-576-7400 during nights, weekends or holidays.

Figure





# Mississippi Provisional Reportable Disease Statistics

January 2015

		Public Health District									State Totals*			
		I	II	III	IV	V	VI	VII	VIII	IX	Jan 2015	Jan 2014	YTD 2015	YTD 2014
Sexually Transmitted Diseases	Primary & Secondary Syphilis	-	-	-	-	-	-	-	-	-	†	†	†	†
	Early Latent Syphilis	-	-	-	-	-	-	-	-	-	†	†	†	†
	Gonorrhea	-	-	-	-	-	-	-	-	-	†	†	†	†
	Chlamydia	-	-	-	-	-	-	-	-	-	†	†	†	†
	HIV Disease	-	-	-	-	-	-	-	-	-	†	†	†	†
Mycobacterial Diseases	Pulmonary Tuberculosis (TB)	0	1	0	1	1	1	0	0	0	4	3	4	3
	Extrapulmonary TB	0	0	0	0	0	0	0	0	1	1	2	1	2
	Mycobacteria Other Than TB	1	2	6	1	14	3	2	3	5	37	33	37	33
Vaccine Preventable Diseases	Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0	0	0	0	0	8	0	8
	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)	1	1	0	0	0	0	1	0	1	4	4	4	4
	Invasive <i>H. influenzae</i> disease	1	1	0	0	0	1	0	1	1	5	0	5	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	0	0	0	0	1	0	1
	Salmonellosis	2	5	4	1	7	4	1	0	9	34	37	34	37
	Shigellosis	0	0	0	1	2	1	0	1	0	6	17	6	17
	Campylobacteriosis	0	1	0	0	2	0	0	2	1	6	6	6	6
	<i>E. coli</i> O157:H7/STEC/HUS	0	0	0	0	0	0	0	0	0	0	1	0	1
Zoonotic Diseases	Animal Rabies (bats)	0	0	0	0	0	0	0	0	0	0	0	0	0
	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	2	0	2
	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.

†Data not available.