Mississippi State Department of Health

Mississippi Morbidity Report

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Zika Virus and Prevention in Mississippi

Key Messages:

- **Zika virus infection during pregnancy is associated with severe congenital abnormalities, including microcephaly.**
- **Pregnant women, or women planning to become pregnant in the near future, should avoid travel to countries with active Zika transmission.**
- **All travelers to Zika affected countries should take every precaution to avoid mosquito bites. Members of mission groups are at high risk of contracting Zika.**
- **Zika virus can be transmitted sexually, necessitating special precautions during pregnancy.**
- **All travelers returning to Mississippi from Zika affected countries should avoid mosquitoes for 3 weeks to prevent transmission to the local mosquito populations.**

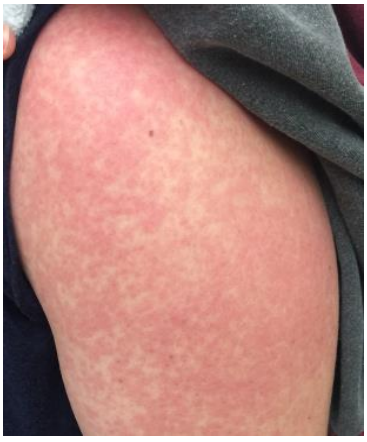
Background:

Zika virus is an emerging arbovirus, first identified in Uganda in 1947. In nature it is maintained through a primate-mosquito-primate infection cycle. Recent human outbreaks of disease in the Pacific Islands and the Americas have been maintained through a mosquito-human-mosquito transmission cycle. *Aedes aegypti* mosquitoes are the principle vector of transmission; other related species may be capable of transmitting the illness but are of lesser importance currently.

Clinical Syndromes Associated with Zika:

The clinical severity of disease in adults is relatively mild, consisting primarily of fever, rash, arthralgias and conjunctivitis. Symptoms typically resolve over the course of a week. A maculopapular rash (see image) that can look similar to measles occurs in the majority of symptomatic cases, and may involve the face trunk and extremities. Eighty percent of infections are either asymptomatic or minimally symptomatic. Rarely Zika can lead to neurologic syndromes such as Guillain-Barre. Fatalities from Zika are extremely uncommon.

Maculopapular Rash in a Zika Patient



Zika in Pregnancy:

In 2015, a massive outbreak of Zika virus spread across Brazil and other parts of Latin America. A subsequent wave of congenital anomalies, primarily microcephaly, was identified in newborn babies in affected countries. Zika virus infection is now firmly established as harmful to the fetus, leading to numerous congenital abnormalities including microcephaly, intracranial calcifications, and brain and eye abnormalities. The risk of harm is highest with infection during the first trimester, with a risk of microcephaly estimated at up to 13.2% from a recent analysis[1]. Congenital abnormalities have been documented from infections at all stages of pregnancy.

Epidemiology of Zika:

Zika virus is spread primarily through the bite of an infected *Aedes* mosquito. Although several *Aedes* species are potential vectors, *Aedes aegypti* is responsible for the current outbreaks in the Americas. This mosquito is the primary vector for other diseases including Dengue, Chikungunya and Yellow Fever. Current transmission patterns of Zika correspond to areas with significant *Aedes aegypti* populations, mirroring locations at risk of Dengue transmission. (Please visit: https://www.cdc.gov/zika/geo/active-countries.html for a listing of countries with endemic Zika transmission).

Additional routes of transmission include sexual, vertical, via blood products, and laboratory exposures. Sexual transmission has been documented from male-to-female and male-to-male. Female-to-male transmission has not yet been identified. Zika virus is detectable in the blood for approximately 1 week, but can be maintained for longer durations other fluids such as semen. Zika virus has been detected in semen at least 62 days after symptom onset, and in one documented case, sexual transmission is estimated to have occurred 32-41 days after the man's onset of symptoms, indicating a potential risk of sexual transmission well beyond the symptomatic phase.

Zika virus transmission via mosquitoes is ongoing in almost all countries in Central America, South America, and the Caribbean with the exception of Chile and Uraguay. Other countries in Asia and the Pacific have an existing, but much lower risk of Zika transmission. (For a complete list of countries with active transmission, please visit https://www.cdc.gov/zika/geo/active-countries.html). In the U.S., no local mosquito-borne transmission has been identified, however as of June 29, 2016, more 934 travel associated cases have been reported, and of those 287 have been in pregnant women. Additionally, 13 cases of sexual transmission have been documented in the U.S. In Mississippi, three travel associated cases have been identified, all in young adults working as members of mission trips to Haiti. There have been no sexual transmission related events detected in Mississippi (Table 1).

Table 1

Zika Cases in the U.S. and Mississippi as of June 29, 2016

	U.S.	Mississippi
Travel Associated Cases	**934**	**3**
Travel Associated Cases in Pregnancy	**287**	**0**
Sexual Transmission Events	**13**	**0**
Local Mosquito-borne Transmission	**0**	**0**

Risk of Zika Virus in Mississippi:

Currently in Mississippi, only travelers to countries with active Zika transmission or sexual contacts to travelers are at risk for Zika infection. There is no active mosquito borne transmission of Zika in the U.S. at this time. The most efficient vector for Zika transmission, *Aedes aegypti*, is far less common in the U.S. than in other parts of the Western Hemisphere. Models suggest that Zika transmission in the U.S. is most likely to mimic previous experiences with Dengue and Chikungunya, with transmission limited to areas with active *Aedes aegypti* populations such as Florida and Texas. *Aedes aegypti* has not been identified in Mississippi since the 1990's, but extensive efforts are underway to locate any populations in the state. Other *Aedes* species, such as *Aedes albopictus*, are abundant in Mississippi, but are felt to be far less efficient vectors of Zika and less likely to lead to sustained transmission.

Prevention of Zika Virus Infection:

At present, only travelers to Zika affected countries and sexual contacts to travelers are at risk of Zika virus in Mississippi. Travelers on mission trips have been identified as an especially high risk group in Mississippi as they spend increased time outdoors.

To prevent travel associated cases of Zika virus:

- Pregnant women or women at risk of pregnancy should avoid travel to Zika infected countries (please see list of countries at https://www.cdc.gov/zika/geo/active-countries.html).
- Women at risk of pregnancy who must travel should take measures to prevent pregnancy (see below) including the use of Long Acting Reversible Contraception (LARC's).
- Travelers should take every precaution to avoid mosquito bites, including the proper use of repellants (such as those containing DEET), appropriate clothing, and sleeping in an environment protected from mosquitoes. For complete guidance please visit https://www.cdc.gov/zika/prevention/index.html .

To Prevent Sexual Transmission and Congenital Zika:

- Pregnant women should not have unprotected (condom-less sex) with any traveler to a Zika affected country for the entire duration of the pregnancy.
- Men with a history of symptomatic Zika infection should avoid unprotected sex with a woman for 6 months after the onset of symptoms.
- Men with a travel history (but no symptoms) should avoid unprotected sex with any woman for 8 weeks.
- Women wishing to get pregnant should wait 8 weeks after travel or after any Zika symptoms before attempting conception.

Prevention of Zika in Mississippi Mosquito Populations:

- To prevent the transmission of Zika virus to local mosquito populations, all travelers returning from Zika affected countries (symptomatic or asymptomatic) should avoid mosquito bites for at least three weeks after returning.
- Efforts to avoid mosquitoes include staying indoors, using mosquito repellant and wearing long sleeve clothing while outdoors.
- Efforts to remediate mosquito breeding areas should be performed by someone without a recent travel history to a Zika affected country. It is not recommended that travelers empty standing water around the home as this activity might increase the risk of mosquito encounters.

Testing and Treatment:

Since other mosquito borne infections, such as malaria, chikungunya and dengue are currently circulating in the same countries a thorough medical exam is indicated in any symptomatic travelers. It is important to rule out the possibility of dengue infection before using NSAIDs or antiplatelet agents as these medications can worsen the outcome of dengue. There are currently no specific treatments or vaccines for Zika available at present, but vaccines are under development.

Currently available Zika tests include RT-PCR (serum and urine) and IgM serology. Both are available through the Mississippi Public Health Laboratory (MPHL). RT-PCR is the preferred testing method early in illness (Table 2). Serum IgM to Zika can be useful beyond the symptomatic phase but should be used with caution as the test is prone to false positive results due to cross-reactivity with other Flaviviruses such as West Nile Virus. Additional confirmation using Plaque Reduction Neutralization Testing (PRNT) through CDC is required to confirm IgM positive results. Commercial RT-PCRs are now available, but consultation with the MSDH Office of Epidemiology (601 576 7725) is recommended prior to testing any individual for Zika virus infection. See Table 2 for available tests at the MPHL.

Testing is indicated for:

- All persons, including pregnant women, with one or more of the following: fever, maculopapular rash, arthralgia or conjunctivitis **AND** a history of travel to an area reporting Zika virus activity or a history of sexual exposure to Zika in the two weeks prior to illness onset;*
- Asymptomatic pregnant women who, while pregnant, traveled to an area reporting Zika virus activity (testing should occur between 2-12 weeks after travel).

*Testing for potential local (Mississippi) mosquito-borne disease is indicated if there are known travel associated cases in the area and if the patient has three out of four of fever, maculopapular rash, arthralgia or conjunctivitis

Table 2

Zika Tests Currently Available at the MPHL

Test	Indications
Zika Serum and CSF* RT-PCR *Must accompany a patient-matched serum	• Travel history within the previous 14 days, and • At least one symptom of Zika, and • Less than 7 days after symptom onset
Zika Urine RT-PCR *Must accompany a patient-matched serum	• Travel history within the previous 14 days, and • At least one symptom of Zika, and • Less than 14 days after symptom onset
Zika Serum IgM	• All pregnant women, at 2 to 12 weeks after travel, or • Symptomatic travelers at ≥4 days after symptom onset (in conjunction with RT-PCR as outlined above)

What is Mississippi is Doing to Prepare for Zika:

Prevention Messaging: To prevent adverse outcomes from Zika, MSDH is conducting a broad campaign to reach high risk travelers and pregnant women. Distribution outlets include movie theatres, Spanish language newspapers, airport, pharmacies, clinics and internet informational spots. Missionary groups, a high risk population in Mississippi, are being specifically targeted with information on how to avoid Zika and other mosquito borne illnesses when traveling. Posters in both English and Spanish are available for physician offices to inform pregnant women of the risks of Zika and what steps they can take to prevent infection. Please see the link http://msdh.ms.gov/msdhsite/_static/resources/6757.pdf for a printable PDF version.

Surveillance: Zika virus was made a Class 1 Reportable Condition in Mississippi by the Board of Health in April 2016, necessitating notification to MSDH within 24 hours of first knowledge or suspicion of the disease. In addition to routine surveillance for human illness, MSDH is maintaining a pregnancy registry of women with evidence of Zika infection, in conjunction with the Centers for Disease Control and Prevention. MSDH will systematically collect clinical data from every Zika associated pregnancy, and combined with data from across the nation, valuable insights into the risks of this syndrome will be uncovered. The MSDH Birth Defects Registry is enhancing the capacity to detect congenital events that might signal an association with Zika.

Vector Assessment and Control: In May of 2016, MSDH started a statewide effort to characterize Aedes mosquito populations for every county. In collaboration with Mississippi State University and the University of Southern Mississippi, five locations in every county are sampled monthly for *Aedes* mosquitoes to determine the species prevalence and abundance. Thus far, no *Aedes aegypti* have been identified in Mississippi for 2016. Mosquito control is a local (county or municipal function) and not under the purview of any state agency. MSDH coordinates control efforts with local governments.

MSDH is updating a statewide assessment of local mosquito control capacities, to identify strength and deficits for Zika response, if needed.

Zika Response Planning: In March of 2016, MSDH activated an Incident Command Structure to coordinate the multiple disciplines necessary to mount an effective Zika response. Mississippi is updating a comprehensive Zika response plan that, in addition to the activities outlined above, will allow MSDH to coordinate with multiple agencies to respond to Zika transmission events within our borders.

What Mississippi Providers Can Do:

MSDH requests that all physicians and providers across the state take the following actions:

- Recommend that all pregnant women avoid travel to Zika affected countries for the duration of pregnancies.
- Recommend that all pregnant women take precautions to prevent sexual transmission from travelers from Zika countries as outlined above.
- Recommend women planning to get pregnant take precautions to avoid Zika, either through travel or sexual contact.
- Inform your patients and communities about the risk of Zika and the need to take special precautions when traveling, especially those planning mission trips to affected countries.
- Post Zika prevention messaging, available from the Mississippi State Department of Health in prominent locations in clinical setting, specifically targeting women of reproductive age.
- Please visit www.healthyms.com/zika for additional information.

Reference:

1. Michael A. Johansson, Ph.D., Luis Mier-y-Teran-Romero, Ph.D., Jennita Reefhuis, Ph.D., Suzanne M. Gilboa, Ph.D., and Susan L. Hills, M.B., B.S. Zika and the Risk of Microcephaly; NEJM May 25, 2016.

Mississippi
Provisional Reportable Disease Statistics

May 2016

		Public Health District									State Totals*			
		I	II	III	IV	V	VI	VII	VIII	IX	May 2016	May 2015	YTD 2016	YTD 2015
Sexually Transmitted Diseases	**Primary & Secondary Syphilis**	2	0	4	2	10	0	0	2	8	**28**	†	115	†
	Early Latent Syphilis	3	3	4	1	13	0	3	3	6	**36**	†	203	†
	Gonorrhea	67	55	52	36	123	28	32	45	58	**496**	†	2529	†
	Chlamydia	196	147	188	115	350	118	91	120	145	**1470**	†	7814	†
	HIV Disease	2	1	4	0	14	2	1	8	3	**35**	36	186	239
Myco-bacterial Diseases	**Pulmonary Tuberculosis (TB)**	0	1	0	0	1	1	1	0	1	**5**	2	15	23
	Extrapulmonary TB	0	0	0	0	0	0	0	0	0	**0**	0	4	3
	Mycobacteria Other Than TB	1	9	1	0	9	1	3	5	4	**33**	64	164	211
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**	2	1	5
	Tetanus	0	0	0	0	0	0	0	0	0	**0**	0	1	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	0	0	**0**	11	7	26
	Invasive *H. influenzae* disease	0	2	0	0	1	0	0	0	1	**4**	3	29	19
	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**	0	3	0
	Salmonellosis	1	4	0	1	8	6	2	10	8	**41**	90	198	245
	Shigellosis	0	1	0	3	2	0	0	0	0	**6**	8	27	43
	Campylobacteriosis	0	1	0	0	5	0	1	0	3	**10**	19	71	63
	***E. coli* O157:H7/STEC/HUS**	0	0	1	0	0	0	0	0	0	**1**	3	8	9
Zoonotic Diseases	**Animal Rabies (bats)**	0	0	0	0	0	0	0	0	0	**0**	0	1	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**	16	11	19
	West Nile virus	0	0	0	0	0	0	0	0	0	**0**	0	1	0

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

†Data not available.