National Nurses United
The National Voice for Direct-Care RNs

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Update on Zika Virus Research

The Zika virus epidemic began in Brazil in early 2015 and has rapidly spread in many other South American and Caribbean countries. So far, the United States has seen 193 confirmed cases of Zika virus in travelers returning from countries with local transmission. The international scientific community is working hard to gather information and to better understand the information we already have about Zika virus and the possible risks for microcephaly/other congenital effects and Guillain-Barré Syndrome (GBS). During situations like this, the media often sensationalizes potential risks, spreading misinformation, fear, and panic. This document lays out what we know with some certainty about Zika, what researchers have discovered recently, and what some implications may be.

Disease/Symptoms

Already Known	*Questions/Recent Findings*	*Implications*
Relatively well-described constellation of symptoms: fever, rash, joint pain, conjunctivitis, headache, and muscle pain. Self-limiting illness that lasts 4-7 days.	Whether Zika causes further complications, like microcephaly and other congenital neurological effects and Guillain-Barré Syndrome (GBS)	Seriousness of the disease can affect funding/rapidity of public health response.
80% of people infected are asymptomatic.	Scientists have begun to question whether this number is applicable in other countries currently experiencing epidemics. This number is from a study of a single outbreak on Yap Island in 2007.	This has implications for the way we measure the epidemic and how many people have been infected. If most infectious people do not experience symptoms, we cannot depend on clinical symptoms to distinguish infected from uninfected people.

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Transmission

Already Known	*Questions/Recent Findings*	*Implications*
Primarily vector-borne by *Aedes* mosquito species (*Aedes aegypti* and *Aedes albopictus*). *Aedes* mosquitoes are present only in parts of the Southeastern United States (e.g., FL, TX, etc.) and a few counties in California.	One study shows *Culex* mosquito species can be infected with Zika virus in a laboratory. But scientists don't know if this will translate to infectivity outside of the lab. *Culex* mosquitoes live in more temperate climates in the United States. Another study shows that *Aedes* have unexpectedly low competence as Zika vectors. Again, it is hard to understand how this translates outside of the lab.	This has implications for the risk for Zika to become endemic in the US. Some *Culex* mosquito species are capable of wintering over, which could maintain the virus year-to-year. *Culex* and *Aedes* species have different habitats and behaviors, which can require different vector control methods.
Sexual transmission has been documented in the US, Italy, and France by several case reports. Zika virus has been found in semen weeks after infection.	The frequency and importance of sexual transmission during epidemics. Whether only symptomatic individuals transmit Zika sexually. How long Zika can be transmitted through semen post-infection. Whether sexual transmission is involved in fetal neurological effects related to Zika.	Important implications for infection prevention measures.
Transmission through blood transfusion and other tissue donations.	No reported cases in the US. Reported cases under investigation in Brazil.	Implications for testing of blood donors. Currently, FDA has issued guidelines to defer donations from people with possible exposure to Zika.
Zika virus is found in urine for nearly 3 months post-infection.	Whether Zika virus found in urine has the potential to be infectious. Whether Zika found in other bodily fluids like saliva post-infection and for how long.	Important implications for infection control.

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Microcephaly/Congenital Zika Syndrome

Microcephaly is a condition in fetuses and newborns where their head is significantly smaller than average for their age and gender. Severe microcephaly is related to developmental delay, intellectual disability, vision and hearing problems, and other effects. Intracranial calcifications and other brain abnormalities have been observed in addition to microcephaly.

Already Known	*Questions/Recent Findings*	*Implications*
Reported cases of microcephaly increased months after rates of Zika first increased in Brazil in 2015. Reported cases of microcephaly increased in French Polynesia in 2013.	Whether causal connection. If microcephaly rates increase in Colombia, it will lend evidence to the causal relationship. Three Zika-related cases of microcephaly/brain abnormalities have been identified in Colombia out of thousands of pregnant women with Zika.	Seriousness of disease complications. Important implications for prioritizing response (e.g., vaccine development) for pregnant women and women of child-bearing age.
Zika virus has been found in: - Pregnant women and their fetuses with microcephaly, brain calcifications, or other deformations - Tissues from miscarriages or fetal death where mother had clinical signs of Zika (here, here) -	Whether this observed association is causal and/or involves other factors. Whether a plausible biological mechanism exists. Hypotheses (here, here, here) have been made with laboratory-based evidence. Whether the trimester of infection during pregnancy determines fetal effects.	Implications for clinical management development to prevent neurological effects of Zika virus on fetuses.
Microcephaly and other neurological effects have not been seen in outbreaks prior to 2013.	Whether this is a relic of poor surveillance in areas with endemic Zika virus. Whether the virus has mutated in the most recent epidemics. Whether introduction into a fully susceptible population is revealing preexisting side effects of the virus.	Implications for laboratory research using virus strains isolated in 1947. Implications for future public health planning.

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Guillain Barre Syndrome (GBS)

Guillain-Barré syndrome is a rare auto-immune disorder that results in damaged nerve cells, weakened muscles, and paralysis. Most people recover from GBS, but some suffer permanent damage or death.

Already Known	*Questions/Recent Findings*	*Implications*
GBS is caused by many different conditions, including other infectious diseases.	Whether Zika causes GBS.	Seriousness of disease. Public health preparation for potential Zika epidemic.
Increase in reported GBS cases in French Polynesia during 2013 Zika outbreak. Increase in reported GBS cases in Brazil during 2015 peak Zika outbreak. Increase in reported GBS cases in Colombia during 2015-6 Zika outbreak.	Recently published study establishes strong evidence for causal connection between Zika infection and subsequent GBS.	Seriousness of disease. Public health preparation for potential Zika epidemic.

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