

The Disease and Current Status in Ohio

The disease is primarily spread through the bite of an infected *Aedes* species mosquito. The illness is mild in most people, lasting for several days to a week with most common symptoms including one or more of these: fever, rash, joint pain, and conjunctivitis. As many as 80% of those infected do not realize they have the disease. However, if infected during pregnancy, the disease may cause microcephaly, a very serious birth defect, and more rarely, severe effects may occur in adults. Currently there is no treatment or vaccine for the virus. As of April 26, 2016 there were no local mosquito-transmitted cases of Zika in the continental U.S., but there had been approximately 380 travel-related cases, with 12 of those cases in Ohio. In addition to mosquito transmission, the virus can be transmitted by men to sexual partners, and by blood transfusion.

The Vector

Two species of mosquitos are known vectors. The yellow fever mosquito (*Aedes aegypti*) is the primary vector of the disease in countries where the disease is spreading (Caribbean, South & Central America) because the female feeds almost exclusively on human blood to produce eggs. While this species could potentially be transported to Ohio by human activities (e.g., by movement of scrap tires), it is not currently established here, and cannot survive Ohio winters. A second vector, the Asian tiger mosquito (*Aedes albopictus*) is an established exotic mosquito pest in Ohio; it will feed on other vertebrates in addition to humans.

A. albopictus populations in Ohio currently do not carry the Zika virus; the public health goal will be twofold: control the mosquito population at large, and also prevent transmission of the virus from any infected humans to the *Aedes* mosquito population in Ohio.

Precautions

Because infected individuals may have no symptoms, travelers from countries with active mosquito transmission are advised to wear repellent for 21 days upon return to prevent transmission to local populations of mosquitos. There are also specific recommendations for returning travelers with respect to sexual activity and contact with pregnant women – **the Center for Disease Control website should be consulted for current status of the disease and specific precautions to take upon return to the U.S. for both travelers to affected countries, and those with active disease. Any woman who is pregnant or considering pregnancy is advised not to travel to affected countries, and to read the CDC recommendations carefully.** For comprehensive Zika information and advisories see the Centers for Disease Control and Prevention Zika Virus Home. The CDC website also has a section with factsheets and posters that may be useful to educators and public health officials. The fact sheets are found under *Communication Resources*. The U.S. Food and Drug Administration also has a Zika Virus Response Update webpage with more useful information on the use of repellents, prevention, and the safety of the blood supply.

Public Vector Control Efforts will depend on Transmission Status

Public efforts in Ohio to combat the Asian tiger mosquito can be expected to include mosquito population surveillance, information campaigns for the public and healthcare providers, active community engagement in source reduction, and pesticide application for both adult and larval mosquitos. Health department prevention and control strategies would be expected to progressively intensify if the disease transmission status changes from no mosquitos capable of transmitting

disease in the continental U.S. (current situation), to local transmission in Ohio. Community-wide spraying, as well as targeted control around the home (150' radius) or neighborhood of individuals with active disease were options discussed at the April 26 conference; legal and privacy issues related to these scenarios also were discussed. Supplying pregnant women with mosquito protection kits and insect repellent in order to direct resources to the most vulnerable population was recommended if mosquito populations capable of transmitting Zika were detected in Ohio.

Control and Mosquito Characteristics Affecting Control

Aedes aegypti and *albopictus* mosquitos are relatively weak fliers (2-4 city blocks). They seek cool, shady moist areas and typically rest in the lower canopy of vegetation (10' and under) until they detect a host. Asian tiger mosquitos (*Aedes albopictus*) are most active in the daytime, especially in early morning and late afternoon, which contrasts with the vector of West Nile Virus (*Culex* spp.) which is active in the evening. Widespread outdoor community spraying targets adult mosquitos in flight. With the current application technology, very low amounts of active ingredient are used per acre. The insect must be contacted to be controlled and effect of these applications is transient, but nonetheless effective for knockdown. Widespread outdoor spraying usually take place in the evening when the best conditions for spraying are present, - very light winds 1-9 MPH. The goal is to produce a fine suspension of droplets that moves slowly through the target area; optimal spraying conditions for ground (truck) applications occur during thermal inversions. Low winds and inversion conditions typically occur at night, but the *Aedes* mosquito flies by day. For best control of the day-flying Asian tiger mosquito, it's advisable to spray closer to daylight hours – ½ hour before dusk, ½ hour after sunrise, but close enough to evening to take advantage of more advantageous environmental conditions. Other modifications may be necessary for programs that previously focused on the night-flying West Nile Virus vector in order to effectively control *Aedes* species. Furthermore, to ensure continued effectiveness of insecticides, testing for insecticide resistance in the mosquito population and resistance management is critical.

Another approach to adult mosquito control is to target a limited area with residual insecticides. Often called “barrier treatments,” these can be effective against *Aedes* species. To be effective, a residual insecticide is applied as a mist to all surfaces that adult mosquitos frequent, including external walls and any vegetation 10' in height or less in the area. Any shady, cool, non-vegetated areas (e.g., under porches) surrounding the residence also must be treated. Conventional mosquito control products may be hazardous to pollinators and beneficial insects; when making barrier treatments, vegetable gardens and plants that favor pollinators should be avoided. Avoiding the pollinator plants probably will not reduce the barrier control significantly because *Aedes* mosquitos don't frequent bright, sunlit areas of the garden. Typically, barrier applications use a synthetic pyrethroid in a long-lasting formulation.

Attractive toxic sugar bait (ATSB) is a new technology currently being evaluated for mosquito traps and barrier treatments with less impact than conventional pesticides on non-target pollinators and other beneficial insects. Some studies are promising, but the method is not yet considered an alternative to conventional adulticides.

Source reduction to remove habitat, and larval control with pesticides are key components of a comprehensive control plan that complement the adult control strategies.

For more information on control see these CDC webpages: *Interim CDC Recommendations for Zika Vector Control in the Continental United States. Surveillance and Control of Aedes aegypti and Aedes albopictus in the United States. Also see the Mosquito Control Methods page on the National Pesticide Information Center website.*

Fight the Bite. What you can do to avoid transmission of mosquito-borne disease – recommendations from the Ohio Department of Health Website. www.odh.ohio.gov/zika

- When outdoors, wear [Environmental Protection Agency \(EPA\) registered insect repellents](#). All EPA-registered insect repellents have been evaluated for effectiveness. Always follow the repellent label instructions. Be sure you understand clearly how to apply and how much to use. Do not allow children to handle the product and store safely out of their reach. A useful report that compares repellent efficacy is available from [Consumer Reports](#).
- Unlike many mosquitoes, the Asian tiger mosquitoes are most active during the day and are most common in shade conditions. Be sure to use insect repellent and wear long sleeves and pants where these mosquitoes are active. For individuals sensitive to repellents, repellent-treated clothing is available, as well as repellents designed for treating clothing, tents, etc.
- Make sure you have intact screens on your windows and doors to keep mosquitoes out.
- Yellow fever mosquitoes and Asian tiger mosquitoes are both container breeding mosquitoes. They do not breed in ponds, puddles or marshes but are capable of breeding in any size container, including very small ones, - even folds of tarps. Remove their breeding sites by emptying standing water from flower pots, buckets and barrels. Change the water in pet dishes, and replace the water in bird baths at least weekly. Drill holes in tire swings so water drains out. Check gutters to make sure they are flowing. Keep children's wading pools empty and on their sides when they aren't being used.