Discussion of the Interim CDC Recommendations for Zika Vector Control in the Continental United States

03-25-16

Target Audience: Preparedness Directors and National Partners

Top 3 Highlights from the Call

1. There is a need for discussion of shared experiences among states, especially for those states with little history of the Aedes aegypti mosquito and who feel underequipped and concerned about planning strategies.
2. Now is the time for states to develop their communications network and begin testing for effectiveness of mosquito control products.
3. There are existing resources available on the CDC Stacks website to help states better understand their risks and find more information about mosquito species, their habitats and prevention measures.

Speakers

**Chris Kosmos, Division Director, Division of State and Local Readiness, CDC**

**Janet McAlister, Entomologist, CDC**

**Agenda:**

Janet McAlister provided highlights from interim guidance followed by Q&A.

**Synopsis of the Call Speakers’ Remarks**

**Janet McAllister:**

- These guidelines are one small part of that broader phase response plan and are intended to be updated, so check back regularly. In using them, it is important to consider the local resources and geography of your state.
- There are different phases of this guidance, including what you can do before and during the season, what to think about after confirmed transmission, and what to do if that transmission becomes widespread between counties, towns or jurisdictions.
- We’re at the beginning of mosquito season in parts of the country and we encourage states to use an integrated approach where surveillance is guiding your actions.
- This is the time to think about and develop a communications network. A lot of vector control departments stand alone, so they need a way to communicate confirmed cases to health departments to prevent Zika virus from being transmitted.
Call Notes

- States need a good idea of the occurrence of Aedes aegypti to target highest risk area as well as a good idea of the existing mosquito control programs in your state for a more systematic use of resources.
- Plans should include capacity inventories, POC identification, contingency contracts, working with universities, tire removal processes, community clean up/ source reduction, education and outreach, clean up campaigns etc.
- Know the legal framework for vector control on private property, otherwise it will slow down the process.
- Surveillance - look for where the mosquitoes are found in the state. Aedes aegypti aren’t the same species that transmit WNV. They have a different biology. The trap that works best for adults is the BG-Sentinel. You can survey for larvae using containers, as these mosquitoes will lay eggs in place that dry up quickly, so survey techniques must be tailored slightly.
- Conduct insecticide resistance testing now to know which products will be effective and which aren’t. At the state level you don’t have resources to do resistance testing, so reach out to mosquito control districts, perhaps using an intergovernmental agreement.
- Although guidelines say 150 yards of spraying, if you need to expand that buffer, that’s a local discussion that you’re going to have to make on your own.
- Consider targeted indoor residual spray, not for every house, but if a case occurs in a neighborhood without screens or AC, where mosquitoes will readily enter into houses.
- Response with vector control will be similar to response with first local case. Tailor the reaction that you have/control based on what’s going on at that point in time and in that geography.
- This guidance has more detailed description of the surveillance methodologies, including pupae and larval surveys, surveillance materials etc. There’s also more detailed information on the website that I would encourage you to use while developing your plans.

Questions & Answers

Can you speak more on jurisdictions considering indoor residual spray?

Pregnant women are an audience we want to protect from Zika. When I say residual spray, I’m not referring to the type of spraying for malaria programs, but targeted spraying in the places where this mosquito will be found resting (porch, doors, behind vegetation and foundations, dark spots).

There was some interesting information out of Puerto Rico around resistance testing. Can you talk a little bit on that?

We have actively tested the mosquitoes in Puerto Rico for insecticides resistance to try and come up with a strategy and products that would be effective. In Puerto Rico, there’s widespread resistance to the main spray (note: Permethrin?). So we’ve been looking at different municipalities and which would be the most effective, but it’s an
exposure issue because you could be exposing people to a pesticide needlessly if mosquitos are resistant. In planning you should have a pretty good idea of what products are effective.

This mosquito is a city dweller. If you were thinking about resources and having limited resources, what should you consider when applying your interventions to more urban settings?

It’s very important to do surveillance to know where these mosquitos are and where they are not. This species prefers to bite humans and live in warmer towns with lower tree coverage. When you’re doing your surveillance, you want to tie the data together. These mosquitos don’t put all of their eggs in one container to hedge their chances of offspring surviving. Counting the number of larvae in surveys/eggs on a paddle doesn’t necessarily give you good information about the abundance of adult mosquitos. Pupae surveys are a little more accurate about reflecting the abundance of adult mosquitos as they made it past larval stage. This species is a better vector as it has a preference on human, but is a shy biter, biting multiple people for a full blood meal.

I’d like to ask a clarifying question in regards to the strategies you described under confirmed transmission phase (control measures around patients home). Do you recommend these responses to imported cases as well as local acquisition?

The goal is to not have local transmission start. Treatment around a patient’s home is a very good idea. As far as vector control, we’re saying it has to be a local case before vector control.

Can you speak a little more on lab positive and asymptomatic cases compared to symptomatic cases?

We struggle with the problem that most people who are infected don’t necessarily show symptoms right away. So as far as lab testing of people, those are the only cases that we’re going to know about. If someone’s asymptomatic but is tested positive, they should be treated the same way.

Testing of mosquitos for Zika virus is not currently recommended before a confirmed case. Does that mean there’s never a time to test mosquitos for Zika? This is hard to explain to policy makers.

I would say, no, because getting the adult mosquitos to test in the first place is difficult. Even the trap I mentioned is not super-efficient at sampling the adult population. If there’s local transmission at that point, then testing mosquitos is important to get a better idea of infection rates, targeted around where that transmission is observed.

Understanding the timeline of the incubation period, when would we expect to see human cases locally transmitted by mosquitos?
This varies on temperatures and local environmental conditions, but generally about 7-10 days after infection, the person is able to transmit the virus. Then you have the incubation period in that person. I’m unsure of the timing of when you’ll see symptoms in the second infected person but it will be a relatively short amount of time.

Earlier you had mentioned targeted adulticiding and control efforts around imported cases of Zika. Is that recommended for only the Aedes aegypti or the other species?

Aedes albopictus, in the lab, is just as competent of a vector as Aedes aegypti. It grows the virus just as quickly. There are a couple of outbreaks that have occurred that have been shown to be driven by Aedes albopictus, and it’s not unheard of that it cannot drive an outbreak. However it’s considered a secondary vector because of its feeding habits and not being as closely associated with humans (they can thrive in the forests). However it’s important to know, for surveillance, where both species are located.

Is there a critical level of albopictus where there would be more of a concern?

We don’t have levels of information on that, but as time goes on and as we potentially learn more, we might change our guidelines.

North Carolina hasn’t had cases of Aedes aegypti, so it’s not really something the state is prepared or equipped for. So it’s concerning as we don’t have capacity to adhere to a national recommendation. I heard some Zika outbreaks have been driven by Albopictus. Could this be the case in the SE US?

We don’t know the answer to that. There are multiple groups, including the CDC in Fort Collins and universities looking at vector competence of mosquitos throughout the US. With the Asian strain that’s circulating, they’re also looking at vector competencies in the strain (as well as the species). Again, these are guidelines to develop plans, but states need to take into account their local resources and needs. North Carolina is not the only state in that boat, and CDC is in the same boat as far as a shortage of resources. We’re hoping that conversation between the states is occurring and it’s open for discussion at the summit as well.

With temperatures warming up, how long might it take for mosquitos to become prevalent, i.e. days above a certain temperature?

In the far south of the US (e.g. Florida, North Carolina) the mosquito can come out and bite and then find shelter when it gets colder. They’re never truly completely gone. In more northern parts, as temperatures warm and springs rains occur, the larvae become active and the mosquito is starting to come out. It’s already out in some parts of the US.

Comment: In response to many epidemiologists who are not familiar with Aedes aegypti, there are a great many resources out there, old manuals that are very useful (but the only part I would stay away from are pesticide information). In the 1950s CDC released manuals
about Aedes aegypti that are still wonderful and relevant. There’s a lot of information in them and you can find them at CDC Stacks online. There’s also an old movie made by the CDC in 1945 dealing with the dengue issue in Tampa FL and it is a great film that shows a lot of good information about how to do a house investigation about where the mosquitos will be, emptying out old tires (which collect a lot of water and are hard to dry out) etc. A lot of the biology has been known for a long time – we don’t need to reinvent the wheel. Those old manuals are a great starting point. Later manuals were also produced in the 1970s. I would recommend going and reviewing those, or going online and searching the mosquitoes in your state and finding old manuals.

Once the case is reported and a location visit is done to assess risk, has anyone had experience with this and how did the community react to the vector control practices? Any advice about managing community fear?

I would suggest that if you’re not sending someone to the Zika Summit from your state, do so in order to talk to other states about their experiences. Augment: Registration is closed for Zika Summit, however we will have ongoing calls after the Summit and you will have the opportunity to join virtually if you’re not able to attend in person.