

How Florida has made tough calls in Zika fight

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When the first cases of local Zika virus transmission were confirmed in South Florida this summer, physicians, public health officials and policy makers had to make difficult decisions on how best to contain spread of the infection linked to birth defects, Guillain-Barre syndrome and other neurological problems. The Sunshine State experience is especially instructive in light of news from Texas of the first case of mosquito-borne Zika infection there.

Quick moves on testing, surveillance, mosquito abatement and public education have been needed to face up to this challenge without precedent on U.S. shores, according to Celeste Philip, MD, MPH, surgeon general and secretary of the Florida Department of Health.

The first choice faced by Dr. Philip and colleagues was whether to take a more aggressive approach to testing than what the Centers for Disease Control and Prevention (CDC) had been advising.

“When you look at the previous CDC guidance for testing, travel history was one of the requirements,” Dr. Philip said during an educational session at the 2016 AMA Interim Meeting. “But if you’re only testing people who have traveled, then how are you going to find local transmission?”

“I wish I could tell you that we had a really strategic approach” to these testing decisions, Dr. Philip said. “But, really, we just looked at the weather getting warmer, getting closer to the mosquito season, and if the onset of symptoms and presentation sounded suspicious for Zika, then we began working with local providers to do testing for Zika even though there was no history of travel.”

It was that testing that led to identifying the first locally transmitted Zika case in July. That information would go public quickly, with Gov. Rick Scott making the announcement. And that was no small matter, Dr. Philip explained.

“The governor actually made the announcement knowing there were many unanswered questions, and understanding that, for our state, tourism is an important source of income for many people and we employ a lot of our residents through tourism,” she said. “From a public health perspective, we

know having a job is important.”

Another two mosquito-borne cases were identified that were linked to one another but not to the first case. That is what led the CDC in July to issue its first-ever U.S.-based travel warning regarding Miami’s Wynwood neighborhood.

This set off “the shoe-leather epidemiological work to understand the scope” of the problem. Dr. Philip and colleagues consulted with the CDC on gathering convenience samples of residents, and in so doing opted to test only urine even though the CDC has generally advised testing urine and serum.

“We were most interested in using PCR [polymerase chain reaction], because oftentimes it persists longer in urine,” she said. “We figured that, going into people’s houses, they would be likelier to say, ‘Yeah, I’ll pee in a cup,’ versus doing a needle stick. This way we were able to get children 5 and older to provide samples.”

The health department worked with a federally qualified health clinic to offer free testing to any people living in the Zika transmission zone and also tested workplaces linked to the infected patients, “and we came up with an additional 32 infections this way,” said Dr. Philip. She and her colleagues described their efforts in the Sept. 30 issue of the CDC’s *Morbidity and Mortality Weekly Report*.

New protocol on spraying

The next difficult decision came on mosquito abatement. That choice was hard because, based on consultations with entomology experts at the CDC and in Florida, there were not very good data and protocols on dealing with *Aedes aegypti*, the species that carries and transmits the Zika virus.

“Our preliminary thoughts were that aerial spraying would not be effective, based on studies that were 20-plus years old,” she said. “In the meantime, technology had advanced such that ultra-low-volume particles between six and 18 microns [would] allow for a very even spread and penetration to even cryptic breeding spots. We thought this would be the ideal way to try out this protocol because, quite frankly, there was nothing else to guide us.”

The effort—combining adulticide and larvicide truck and aerial spraying—appears to have been successful, with the last reported onset of Zika symptoms in the Wynwood neighborhood having begun in early August, with an end to active transmission declared Sept. 19, meaning no new infections for 45 days. In North Miami Beach., the first reported Zika symptoms began Aug. 8, and an end to active transmission was declared Nov. 22. In South Miami Beach, Zika symptoms for the first identified case started July 18. The health department has not yet announced an end to active transmission there, but the last five cases have come as single instances rather than clusters.

“We have a process where, as soon as we’re concerned about a potential case of mosquito-borne illness, we call the mosquito [control program] right away about investigating and mitigating and treating,” Dr. Philip said. “We believe that process has allowed us to see these isolated, singleton cases that have not led to further transmission.”

So far, more than 5,500 mosquito pools have been tested with five being positive for the Zika virus. As of Nov. 23, there have been 238 locally acquired Zika infections confirmed, all in South Florida. Laboratory-confirmed cases of Zika in pregnant women stand at 170. At the time of Dr. Philip’s presentation, two infants had been born in Florida with Zika-related congenital defects. She noted another two cases of Guillain-Barre syndrome linked to Zika virus.

More than birth defects at issue

In addition to heeding guidance on Zika virus transmission and prevention, physicians also should be aware of the link to Guillain-Barre syndrome, CDC neuroepidemiologist James J. Sejvar, MD, said during a separate presentation at the Interim Meeting educational session.

“At this point, there’s strong evidence of association between Zika virus and Guillain-Barre syndrome. There are strong geographic and temporal correlations with Zika virus outbreaks, and a significant proportion of Guillain-Barre syndrome cases have a Zika-like illness prior to onset,” he said. “Investigations in French Polynesia, Brazil and Colombia suggest increasing Guillain-Barre syndrome incidence that is many-fold higher than one would expect. There is growing laboratory evidence supporting the association.”

More investigation is needed to better define the link between Zika and Guillain-Barre syndrome and other neurological manifestations of the mosquito-borne illness, Dr. Sejvar said.

“While we hear quite a bit about congenital abnormalities associated with Zika virus, I just want to reinforce to folks that Guillain-Barre syndrome is not a benign illness, and it can be seen with Zika and it appears to be causally associated.”

Dr. Sejvar added that it is hard to predict the course of Zika transmission in the U.S. He noted that viruses such as Zika that have “efficient transmitters” like *Aedes aegypti* are “incredibly difficult to control.” He noted that, at one time, West Nile virus infected more than 1,000 people annually but the impact has fallen, “presumably due to mounting immunity and potentially changes in the activity of the mosquitos.”

“We could see kind of an increase in Zika for several years but then see a decrease in cases,” Dr. Sejvar said. “It’s going to be interesting and also important to see what the future pattern of Zika

transmission is. It's likely not going to just stay in Miami-Dade County but, for various reasons, we're not going to see huge outbreaks like we are seeing in Brazil and Colombia."

The CDC has struggled, particularly in its shifting advice on birth control, contraception and congenital abnormalities, to stay abreast of a "fluid situation." He said Zika "is an incredibly unusual virus that we haven't really seen before, so we've really had to play it by ear during these past several months."

That baseline of uncertainty makes teamwork among the relevant stakeholders vital, Florida Surgeon General Dr. Philip said.

"It will take all of us working together, responding to these public health issues," she said, lauding the efforts of physicians, medical groups, hospitals and health systems to identify Zika cases and educate patients.

Medical leaders around the globe are seeking that kind of teamwork on Zika. At its general assembly in October, the World Medical Association adopted a resolution calling on the World Health Organization and other relevant agencies to "gather data on the efficacy of different mosquito control methodologies, including the potentially harmful or teratogenic effects of the use of various insecticides."

The WMA, which consists of the leaders of national medical associations worldwide including the AMA, also called for publicly funded efforts to develop diagnostic tests, antivirals and vaccines that are safe for pregnant women and affordable to the highest-risk patients. The WMA also said states should closely track infants born with Zika-related congenital defects and that travel-related recommendations on Zika should be disseminated widely, especially people who are considering becoming parents.