NEW ZEALAND BIOSECURE

BORDER HEALTH NEWSLETTER - September 2016

WELCOME!

The mozzie numbers are still low in New Zealand, and its know wonder if you look out the window. That gives us some time to discuss the newest wrap-ups about Zika. This arbovirus is keeping the world on tenderhooks. It is believed that we should prepare for a "global epidemic" of microcephaly. But it seems that the potential surge in birth defects could extend far beyond the microcephaly. Zika should be considered a congenital viral disease like rubella or cytomegalovirus. The World Health Organisation urged countries across South-East Asia Region to continue to take decisive action to prevent, detect and respond to Zika virus as Thailand confirmed two cases of Zika-related microcephaly and Zika is endemic in Phillippines, Malaysia and probably Nepal. Its time for another special Zika issue, this time focusing on vaccination news, studies about possible vectors and problems that come with control measures.

SAMPLES

During September 580 samples were collected by staff from the 12 DHBs with only 59 positive. The numbers are slightly higher compared to last year as there has been an increase in *Culex pervigilans* and *Cx. quinquefasciatus.* There has also been a few *Ae. antipodeus* this month whereas last year there was none.

INCURSIONS/INTERCEPTIONS

Species	Adults		Larvae	
New Zealand Mozzies	**Sep 16**	**Sep15**	**Sep 16**	**Sep 15**
Aedes antipodeus (winter mosquito)	3	Nil	Nil	Nil
Ae. notoscriptus (striped mosquito)	2	Nil	1824	1928
Culex astilae	Nil	Nil	23	12
Cx. pervigilans (vigilant mosquito)	2	2	171	109
Cx. quinquefasciatus (southern house)	3	1	41	12
Opifex fuscus (rockpool mosquito)	Nil	Nil	43	2
Total	**10**	**3**	**2102**	**2063**

During September 3 suspected interceptions were detected.

Please note that the interceptions of live unwanted mosquitoes are highlighted in red. Exotic species in general are highlighted in light blue.

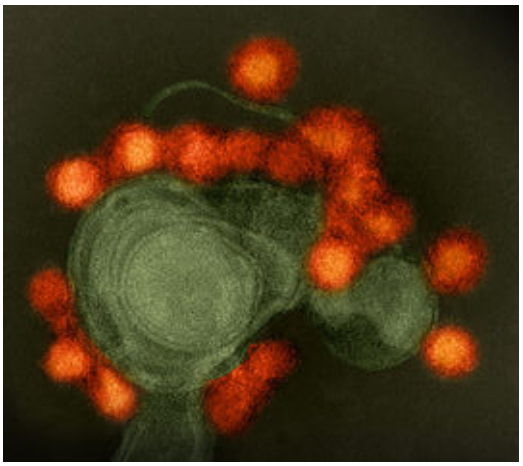
13.9.2016 One dead male *Aedes vexans (nipponi)* was found at a Transitional Facility in Porirua in a shipping container with electrical supplies from Korea.

17.9.2016 One live female *Culex qinquefasciatus* was found at AIAL flying around close to the arrival door.

27.9.2016 A dead male chironomid was found at POA on Bledisloe wharf in a mining truck.

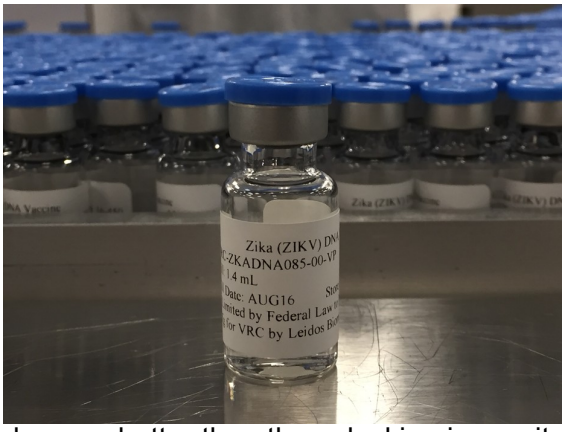
Phone 021 522 476 Email Taxonomy@nzbiosecure.net.nz or Enquiries@smsl.co.nz Website www.smsl.co.nz
BIOSECURITY SPECIALISTS

PICTURES OF THE MONTH



Zika virus, in red, isolated from a microcephaly case in Brazil. NIH Image Gallery, CC BY-NC

ZIKA - VACCINATION NEWS



A vial of the Zika Virus Investigational DNA Vaccine from the NIH. NIH Image Gallery/Flickr , CC BY-NC

University of Pittsburgh announces Zika vaccine success with mice

October 3, 2016 Pittsburgh Post-Gazette

Two experimental vaccines developed at the University of Pittsburgh School of Medicine successfully have blocked transmission of the virus from female mice to their pups conceived weeks after the vaccination.

A Pitt statement says both vaccines protected the pups against neurological damage better than those lacking immunity to the virus from the mother. The results were published online today in the journal EBioMedicine. “We’ve not only developed a promising vaccine candidate to move toward larger preclinical and eventually human clinical trials but also a delivery format that would be inexpensive to produce and distribute to hundreds of thousands of people,” said senior author Andrea Gambotto, associate professor of surgery in Pitt’s School of Medicine, in a release. Zika is a virus that spreads primarily through the bite of an infected mosquito of the *Aedes* species, although sexual transmission also occurs. Pregnant women who are infected can pass the virus to their foetuses, which can cause severe neurological birth defects, including microcephaly, or an abnormally small head and other complications.

One of the vaccines is administered in a novel way, just below the surface of the skin. A patch similar to a Band-Aid affixes tiny crystals to the skin, where they dissolve. The other vaccine is administered through a needle injection and uses an adenovirus — a type of common cold virus — used to present Zika antigens to the immune system to induce an immune response against Zika. Pitt says it will seek funding from the $1.1 billion recently approved by Congress to stem the Zika epidemic to pay for further research and human clinical trials to test the vaccines on humans.

Potential Zika DNA vaccine developed at K-State

By Jared Thompson October 3, 2016, 3:19 pm

MANHATTAN, Kan. (KSNT) – Scientists at the Biosecurity Research Institute at K-State have come up with a DNA vaccine to protect humans from the ZIKA virus. And the vaccine was developed on K-State's campus.

"The fact that it came from K-State, it means a lot to me because as a K-State student it says that K-State is making a come up," Kansas State University student, Kathleen De la Cruz said.

Dr. Stephen Higgs at the B.R.I. said what makes the vaccine better is because it creates memory responses in the body and doesn't have harmful effects.

"It's a vaccine that produces a protein that sort of tricks the body into thinking that it's been affected with the real virus," Higgs said. "And then it produces antibodies."

Meaning your body develops immunity to the virus. So if you ever get infected with ZIKA, your body will know exactly how to handle the virus.

Higgs said first, he and other researches, needed to see if their vaccine actually worked.

"In order to do that, what they needed to do was to vaccinate the animals and then challenge them with the real virus that's currently circulating."

Higgs said the shot is expected to protect you from the ZIKA virus for at least 5. He expects the cost to be minimal to consumers.

So when can you get your hands on this vaccine? Dr. Higgs says this vaccine will be available and approved for us sometime in 2018.

Top Zika Vaccine Candidate Moves Closer to Field Testing

HealthDay News

Oct. 3, 2016 By Dennis Thompson

The leading Zika vaccine candidate should be ready for field testing should new outbreaks occur next year, U.S. health officials announced Monday.

Over the weekend, researchers finished recruitment of the 80 volunteers needed for phase 1 trials of a DNA vaccine to protect against Zika, said Dr. Anthony Fauci, director of the U.S. National Institute for Allergy and Infectious Diseases (NIAID). In a Phase 1 trial, a drug or vaccine is tested in a small group, largely for safety.

"This trial is right on target -- in fact, a bit ahead of time," Fauci said. "It is projected we will have enough information to determine safety and whether it induces the kind of response we predict would be protective."

The DNA vaccine is on track for phase 2 field testing by January, if it proves safe and Zika outbreaks begin with the start of summer in South America, Fauci said. Phase 2 trials test the effectiveness of a drug or vaccine in larger numbers of people.

Researchers hope to include between 2,400 and 5,000 people in the phase 2 trials. The trials will be conducted in at least 15 locations where active Zika transmission is occurring. That could include the United States if an outbreak of Zika occurs next summer, Fauci said.

The DNA vaccine is the furthest along of nine candidate Zika vaccines, the health officials said Monday.

Developed by NIAID's Vaccine Research Center, the DNA vaccine contains a fragment of Zika's genetic makeup that has been recreated synthetically in the laboratory. The vaccine is intended to produce small virus-like particles similar enough to Zika to prompt an immune response that would shield the body against future infection from the virus.
Last month, researchers reported in the journal Science that a two-dose regimen of the DNA vaccine successfully protected 17 of 18 monkeys from Zika infection.

Why a Zika vaccine is a long way off
September 26, 2016 by Robert Bednarczyk Assistant Professor of Global Health and Epidemiology, Emory University
Recent news articles have highlighted positive findings in experimental Zika virus pre-clinical vaccine studies in monkeys and described the start of two Zika virus vaccine trials in humans. These stories have spurred hopes that a Zika virus vaccine will be available to prevent this infection, and its secondary effects, such as abnormal fetal development. But, even with pre-clinical and early stage clinical trials underway, we still may not see a Zika vaccine licensed and approved for use in humans for years.
Developing a vaccine requires hitting just the right sweet spot on a number of conditions, including organism strain, vaccine type, dosage and best age to vaccinate, through pre-clinical and clinical testing, licensing and approval. This process can take a lot of time, often up to 10-15 years.
Start by learning about the disease
We use vaccines to prepare our immune system for the potential exposure to a disease-causing organism. When we are exposed to the vaccine, our immune system responds by producing antibodies, which attack the virus or bacteria.
This particular exposure is then stored in the memory of the immune system, so that if the vaccinated individual is exposed to that virus or bacteria again, these antibodies can be rapidly produced in great numbers to fight back.
Prior to developing and testing new vaccines, extensive surveillance is done to identify all strains of the pathogen causing disease in humans. This allows scientists to weigh the benefits and costs related to which strains should be used in the vaccine. For Zika virus there are two strains – Asian and African – and so far it appears that vaccination with one strain protects against both types.
Different diseases require different vaccine forms
Next, scientists have to decide how to make the vaccine in such a way as to safely trigger the immune system to produce antibodies against the disease. Some vaccines, such as the one for rotavirus, which causes severe diarrhea, contain weakened versions of the virus that do not cause disease to trigger the immune system. Others, like the flu shot, use purified pieces of the virus.
Another kind of vaccine uses virus-like particles – an empty protein shell that looks like the actual virus to the immune system – to trigger an immune response. These types of vaccines can work in two ways. Some, such as hepatitis B vaccine, use injections of the whole outer virus shell to start the immune response. Others use just a small piece of DNA that is the code for the outside virus coat to produce the virus-like particles in the body, but with no ability to cause infection.
The virus-like particle approaches are playing key roles in Zika vaccine development. There are two vaccines currently undergoing clinical trials in humans, one from the National Institutes of Health and one from Inovio Pharmaceuticals, and both use the DNA virus-like particle approach. Another company, Geovax, is developing a vaccine using the whole virus-like particle.
Clinical trials: Phases 1, 2 and 3

Developing the vaccine concept and platform is just one step. This is followed by a rigorous set of testing to show that the vaccine is safe for use in humans and works to prevent disease. These studies involve controlled clinical trials, in which the experimental vaccine, and in later phases a placebo, are given to volunteers who are intensively monitored to evaluate their immune response and any adverse events that may occur following vaccination. These clinical trials are conducted in three phases.

Phase 1 clinical trials are usually small – often a few dozen people. They are done to evaluate if there are any very severe side effects associated with the new vaccine and to get a preliminary sense of how the body responds to the vaccine. This is where we are at with the Zika vaccine. The NIH launched this initial Zika vaccine trial in August 2016, and it is expected to include about 80 people. On the heels of their first study of 40 patients, Inovio is currently enrolling 160 people for a second Phase 1 trial of their Zika vaccine.

If Phase 1 trials are completed successfully, we move on to Phase 2 trials. These are larger – often a few hundred people. In these Phase 2 trials, scientists are looking not only at safety, but at how well the new vaccine produces an immune response.

Finally, after Phase 1 and 2 trials are finished, scientists conduct Phase 3 trials to determine the efficacy of the vaccine in preventing disease. These trials typically contain thousands of participants, with some Phase 3 trials studying up to 70,000 people.

This process is more complex for vaccines like the ones for Zika, because one focus group for Zika vaccines will be pregnant women. Studies must be conducted in nonpregnant people first, and special considerations must be taken for vaccine studies in pregnant women. These considerations go beyond studying the effect of the vaccine on the recipient, to monitoring the effects on the fetus and young infant as well.

Just completing these trials successfully does not automatically bring a new vaccine to market. Multiple reviews by expert panels advising the Food and Drug Administration and the Centers for Disease Control and Prevention are used to determine if a vaccine should be licensed for use, and then recommended for routine use, respectively.

The review does not stop there. Once a vaccine is licensed and recommended for use, there is continued monitoring of how many people are taking the vaccine, how well it works in widespread use, and how safe it is. These post-licensure studies, using systems like the Vaccine Adverse Event Reporting System coordinated by the CDC and FDA and the Vaccine Safety Datalink, often study hundreds of thousands of people who have who have received the vaccine, and are regularly reported to regulatory bodies for review.

A Zika vaccine is still a long way off

The process is long, but recent experience shows it can be streamlined. The testing and emergency use of Ebola vaccines occurred in a remarkably short time during the recent West African Ebola outbreak. However, we were fortunate to have existing Ebola vaccine products on the shelf – based on research done years earlier – that could be tested again during the outbreak.

So, will we have a Zika vaccine in the near future? Early laboratory studies have been efficiently and rapidly conducted and have produced promising data. With multiple Phase 1 clinical trials ongoing in humans, we are progressing well into the vaccine testing process. But the long vaccine development process is focused on ensuring production of the safest and most effective vaccine for use.

ZIKA - VECTOR NEWS

Australia

Common Australian mosquitoes can't spread Zika

The Conversation September 20, 2016

New research from Australian scientists shows common local mosquitoes aren't able to spread Zika virus. This means Australia is unlikely to see a major outbreak of the disease. But a risk remains in northern Queensland. Since the World Health Organisation's declaration of a Public Health Emergency of International Concern in February, due to the effects of Zika on pregnant women, authorities have been on high alert. The concern was not just for travellers heading to regions experiencing outbreaks but for the potential for local mosquitoes to spread the disease when those travellers returned home. Working out which mosquitoes spread which viruses is critical to developing strategic responses to outbreaks of disease.

Which mosquitoes currently spread Zika virus?

Back in Uganda, where Zika virus was first discovered, it was spread by African forest-dwelling mosquitoes such as *Aedes africanus.* Decades later, when the first substantial outbreak was reported on Yap Island in the Federated States of Micronesia, it was *Aedes hensilii.* The relationship between mosquitoes and Zika virus hasn't been well studied but there is general consensus that, internationally, the mosquito of greatest concern is likely *Aedes aegypti. Aedes aegypti* is the cockroach of the mosquito world. It loves water-filled containers around the home and it spreads yellow fever, dengue and chikungunya among others. It loves biting people – lots of people. Wherever *Aedes aegypti* is found, outbreaks of disease keep popping up. Of the 300 or so mosquitoes found in Australia, only *Aedes aegypti* can spread exotic viruses and it was considered the most likely to possibly spread Zika virus locally.

Testing Aussie Mozzies

Australian mosquitoes have been tested against a range of exotic viruses including dengue, chikungunya, West Nile, Rift Valley fever, Japanese encephalitis and yellow fever viruses. Scientists from Queensland Health, the University of Queensland and James Cook University studied the potential for Australian mosquitoes to spread Zika virus and found *Aedes aegypti* does indeed pose the greatest risk. The results are published today in the journal PLoS Neglected Tropical Diseases. The study tested seven types of mosquito implicated in the spread of disease in Australia, including *Aedes notoscriptus, Aedes vigilax, Culex annulirostris, Culex quinquefasciatus* and *Aedes aegypti*. These mosquitoes are frequent biters, are found close to local suburbs and have been shown to transmit other pathogens.

The researchers exposed groups of mosquitoes in the laboratory to blood infected with one of two strains of Zika virus: one originating from a traveller returning to Australia from the Pacific; another derived from the original strain isolated in Uganda.

Once the mosquitoes fed on the blood and virus mixture, they were tested to see if they become infected with the virus and, most importantly, whether the virus was being transmitted in their spit.

The outbreak of Zika virus in Brazil had Australian travellers on alert but transmission is only possible in tropical Queensland. Cameron Webb, Author provided

The only mosquito found to transmit Zika virus was, unsurprisingly, *Aedes aegypti.*
However, what was surprising was the relatively low rate of transmission. Fourteen days after taking a Zika virus-infected blood meal, only 67% of infected mosquitoes were found with virus in their saliva. Based on other mosquito-borne viruses, such as chikungunya, it would be expected to be much higher. The result, however, echoes the results of another study from the United States.
Aedes aegypti is playing an important role in outbreaks of Zika virus but perhaps it is due to more than just their ability to transmit the virus. They have a propensity to bite humans, and to bite many different people.
Mosquito-control efforts should therefore remain focused on *Aedes aegypti*.
These results have important implications for predicting where in Australia we may see an outbreak of Zika virus.
Aedes aegypti is generally only found in tropical regions of Queensland. The mosquito isn't in the major urban area of Southeast Queensland such as Brisbane, Sunshine Coast or Gold Coast. The areas at greatest risk are likely to be those around Cairns, Townsville as well as the Torres Strait. There is a moderate risk around Rockhampton and Gladstone.
The absence of *Aedes aegypti* from any of our major metropolitan regions means the risk of a major outbreak is extremely low.
But there is a risk of a minor disease outbreak where the *Aedes aegypti* is present. Every year, there are small local outbreaks of dengue in tropical Queensland; there's a chance we'll see similar outbreaks of Zika.
The good news is that authorities in tropical Queensland are well-equipped to deal with outbreaks of mosquito-borne disease. They have been responding to local outbreaks of dengue for decades and are prepared for potential outbreaks of chikungunya. The response to the threat of Zika virus remains essentially the same.
The potential for human to human sexual transmission of Zika virus remains a small but not insignificant risk for all regions of Australia. As international health authorities recommend, travellers returning from countries experiencing outbreaks of Zika virus must use condoms or abstain from sex for six months.
If you're planning to travel to a Zika-affected area, consult the Smart Traveller website for the most up-to-date information about the best ways to avoid mosquito bites.

USA

Culex mosquitoes do not transmit Zika virus, study finds
September 22, 2016 Kansas State University
A Biosecurity Research Institute study has found important results in the fight against Zika virus: *Culex* mosquitoes do not appear to transmit Zika virus.
Researchers at Kansas State University's Biosecurity Research Institute studied *Culex* species mosquitoes from across the country, including Vero Beach in Florida, which is near Miami-Dade County where mosquitoes are spreading Zika virus.
The research, "*Culex* species mosquitoes and Zika virus," appears in the journal Vector-Borne and Zoonotic Diseases and involves researchers from Rutgers University, the University of Florida and the U.S. Department of Agriculture.
The findings are important for controlling Zika virus in Florida and preventing its spread to other parts of the country, said Dana Vanlandingham, lead author and assistant professor of virology in the College of Veterinary Medicine.
"It's very important to know that *Culex* mosquitoes are not able to transmit Zika,"

Vanlandingham said. "It enables people to target their control strategies so that they aren't wasting time and effort on a mosquito that isn't transmitting Zika virus."

It is the first Zika virus research publication from the Biosecurity Research Institute. Before this study, *Culex* mosquitoes' role in Zika virus was unclear. By studying *Culex* mosquitoes over a period of time, the researchers found that Zika virus did not multiply and instead disappeared in the species.

"This is great news," said Stephen Higgs, co-author and director of the Biosecurity Research Institute. "We can check this particular group of mosquitoes off the list here in the U.S. and focus efforts of control on the mosquitoes that we know can infect, like *Aedes aegypti* and *Aedes albopictus."*

The Centers for Disease Control and Prevention has identified *Aedes aegypti*, or yellow fever mosquito, and *Aedes albopictus*, or Asian tiger mosquito, as two species that transmit Zika virus. Both mosquitoes are widely distributed in the U.S. and are present in Kansas. "We need to know which mosquitoes to target and which mosquitoes not to target because mosquitoes live in different environments," said Vanlandingham, whose research focuses on zoonotic viruses -- such as Japanese encephalitis and chikungunya. "Some mosquitoes are found outside and some are more in people's homes. You need to know this in order to target your efforts."

Both Vanlandingham and Higgs emphasize the importance of personal responsibility in stopping the spread of Zika virus. Homeowners can get rid of small pools of water where mosquitoes breed and should use mosquito repellent as personal protection.

While a startup fund from the university's College of Veterinary Medicine provided funding for this Biosecurity Research Institute study, there is still a need for additional national funding to support research that stops Zika virus, said Higgs, who also has studied chikungunya, a mosquito-borne virus that has a similar transmission cycle to that of Zika virus.

"We thought that this research is so important with what is going on that we were able to use startup funding," Higgs said. "This research is basic research because we don't know some of the most fundamental information about mosquitoes. Applied research -- such as vaccines and diagnostics -- are obviously very important, but there is a need for funding basic research as well."

New case emerging for *Culex* mosquito as unexpected Zika spreader

Early data from new lab tests reopen question of non-*Aedes* vectors

BY SUSAN MILIUS, SEPTEMBER 28, 2016

ORLANDO, Fla. — New evidence from separate labs supports the controversial idea that an overlooked and unexpected *Culex* mosquito might spread Zika virus.

The southern house mosquito, *Culex quinquefasciatus*, is common in the Americas. Constância Ayres, working with Brazil's Oswaldo Cruz Foundation in Recife, previously surprised Zika researchers with the disturbing proposal that this mosquito might be a stealth spreader of Zika. But two U.S. research groups tested the basic idea and couldn't get the virus to infect the species.

Now, preliminary results from Ayres' and two other research groups are renewing the discussion. The data, shared September 26 at the International Congress of Entomology, suggest that Zika can build up in the house mosquito's salivary glands — a key step in being able to transmit disease. Basic insect physiology is only part of the puzzle, though. Even if the mosquitoes prove competent at passing along Zika, there remain questions of whether their tastes, behavior and ecology will lead them to actually do so.

In the current outbreak, the World Health Organization has focused on mosquitoes in a

different genus, *Aedes*, particularly *Ae. aegypti*, as the main disease vector. But Ayres had announced months ago the discovery of the virus in Brazil's free-flying house mosquitoes.

At the congress, Ayres' foundation colleague Duschinka Guedes reported that captive mosquitoes fed Zika-tainted blood had virus growing in their own guts and salivary glands within days. The virus doesn't spread every time a mosquito slurping contaminated blood gets virus smeared on its mouthparts, though. To move from the mosquito to what it bites, viruses have to infect the insect midgut, then travel to the salivary glands and build up enough of a population for an infective dose drooling into the next victim. When Guedes offered the infected mosquitoes a special card to bite, they left telltale virus in the salivary traces, a sign of what they could do when biting — and infecting — a real animal.

Researchers from China and Canada who were not originally on the symposium program also stepped up to share their results, some of which are unpublished. Some tasks are still in early stages, but both labs showed Zika virus building up in some kind of *Culex* mosquitoes.

At the Beijing Institute of Microbiology and Epidemiology, Tong-Yan Zhao found the virus peaking in the house mosquitoes eight days after their first contaminated drink. As a test of the infectious powers of the mosquitoes, researchers let the Zika-carrying insects bite baby lab mice. Later, the virus showed up in the brains of eight out of nine lab mice. The results were reported September 7 in Emerging Microbes & Infections.

From Brock University in St. Catharines, Canada, Fiona Hunter has found signs that 11 out of 50 wild-caught *Culex pipiens pipiens* mosquitoes picked up the virus somewhere on their bodies. So far, she has completely analyzed one mosquito and reports that the virus was indeed in its saliva.

These positive results contradict *Culex* tests at the University of Texas Medical Branch in Galveston. Those tests, with U.S. mosquitoes, found no evidence that *C. quinquefasciatus* can pick up and pass along a Zika infection, says study coauthor Scott Weaver. Stephen Higgs of Kansas State University in Manhattan and his colleagues got similar results. "We're pretty good at infecting mosquitoes," Higgs says, so he muses over whether certain virus strains won't infect mosquitoes from particular places.

The main risk from *Culex* at the moment is distraction, warned Roger Nasci of North Shore Mosquito Abatement District in Northfield, Ill. After the talks, he rose from the audience to say that *Ae. aegypti* is a known enemy and limited resources should not be diverted from fighting it. George Peck, who runs mosquito control for Clackamas County in Oregon, isn't convinced that the high virus concentrations dosing the test mosquitoes are realistic. Yet he's watching the issue because like much of northern North America, Clackamas doesn't have the Ae. aegypti vector to worry about. But it does have plenty of Culex mosquitoes.

Pool of mosquitoes test positive for Zika, preliminary report shows

Results must be confirmed by U.S. Centers for Disease Control and Prevention

By Paradise Afshar - Digital Editor October 01, 2016

MIAMI BEACH, Fla. - A pool of mosquitoes outside a Miami Beach home has tested positive for Zika, the Miami-Dade County Mosquito Control Division reports.

The division notes that the results are from a preliminary test that must be confirmed by the U.S. Centers for Disease Control and Prevention.

If confirmed, this would be the sixth pool, or batch, of mosquitoes that have tested positive for Zika in Miami Beach.

The test was conducted with a trap located at 575 W 49th St. on Miami Beach on Sept.

20 by the Florida Department of Agriculture and Consumer Services.
The homeowner has been informed about the trap. Inspections and treatment took place in the 1/8-miles area around the properly, according to officials. The location of the mosquitoes is within the expanded zone of transmission as designated by the state.
"Miami-Dade has seen false positives on tested traps in the past," according to a media release from the Miami-Dade County Mosquito Control Division.
Two subsequent test results received from this location have been negative, according to authorities.
"Miami-Dade Mosquito Control continues to conduct an aggressive program to reduce and eliminate mosquito breeding and adult mosquitoes in the entire zone of transmission on Miami Beach," a media release said. "Residents are reminded to do their part to help reduce mosquitoes and the spread of mosquito-borne diseases by draining standing water on their properties and wearing repellent when they go outdoors."
Miami-Dade residents who wish to report a mosquito nuisance should call 311, or download the 311 app.

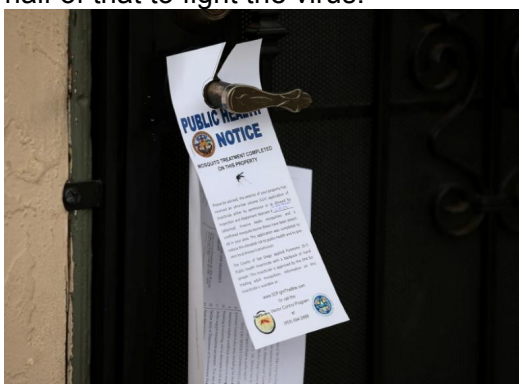
ZIKA - CONTROL MEASURES

USA

HEALTH NEWS | Mon Oct 3, 2016 By Bill Berkrot

Zika funding delay hurt effort to fight virus: U.S. health officials

Top U.S. health officials said on Monday the long delay in getting Congress to approve funding to fight the Zika virus came at a heavy cost in dealing with what they called a serious public health threat.
They said the $1.1 billion in newly approved funding for Zika would be used to expand mosquito control programs, accelerate vaccine development and begin important studies of its effect on babies and children born to mothers infected during pregnancy.
President Barack Obama in February requested $1.9 billion in emergency Zika funding. After months of political wrangling, Congress last week finally approved a little more than half of that to fight the virus.



"Because we've had to wait these seven months, we haven't been able to get a running start on some of the critically important studies to understand more fully the impacts of Zika, to establish better diagnostic tests, to improve our way of controlling mosquitoes," said Dr. Tom Frieden, director of the U.S. Centers for Disease Control and Prevention, adding that vaccine development efforts were also delayed.
County vector control leave information on door handles as they hand-spraying a neighborhood for adult Aedes mosquitoes after a travel-related case of Zika was confirmed in this the area of San Diego, California, U.S. September 12, 2016. REUTERS/Mike Blake

Health officials on a conference call with reporters also said money they had redirected from other efforts, such as for Ebola and cancer research, was unlikely to be reimbursed.
"There's a cost to protecting Americans from the dollars that were reprogrammed," Frieden said.
Health and Human Services Secretary Sylvia Burwell promised that the new funds would be allocated quickly. But she said critical time and energy were spent on working to get the funding instead of working to use it.
"That money would be out the door if we had received it at the time we asked for it,"

Burwell said.

Asked for examples of what would not be funded or would be underfunded because Congress approved $800 million less than what was requested, Burwell pointed to hard-hit Puerto Rico. She said $141 million would be earmarked for Puerto Rico and other U.S. territories out of $271 million that had been requested.

There are more than 25,000 cases of the mosquito-borne virus in the United States and its territories, including more than 2,300 involving pregnant women. Most of the cases are in Puerto Rico, but there is a limited active outbreak in Miami.

US Zika funding shortfall will impede cancer research

Tuesday 4 October 2016 by JessicaGlenza

A man wearing a homemade mosquito costume, who asked not to be identified, protests at the lack of congressional approval to fund a federal response to the Zika virus. Photograph: Jacquelyn Martin/AP

Jessica Glenza in New York

Congress's $800m-short Zika bill means health services will have to divert money originally intended for research on heart disease, cancer and diabetes.

Officials with the federal Health and Human Services Administration called on Congress to consider an emergency health fund for future emerging diseases, similar to the way natural disasters are funded.

"We had to use money we were going to spend within our own institute on malaria and tuberculosis," said Dr Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases. Fauci has headed up the development of vaccines for Zika. There are currently at least nine vaccines the National Institutes of Health is hoping to shepherd through early clinical trials.

Funds from, "cancer, heart disease, diabetes and mental health allowed us to prepare sites to do the phase two trial," said Fauci. "None of that money is going to come back to us … We are going to be able to continue rather smoothly, but it comes at a significant cost."

Zika is a primarily mosquito-borne disease first identified in Uganda in the 1940s. Initially, Zika was considered benign because symptoms were mild and only affected one in five infected people.

It was not until winter 2015 that the virus was considered a serious threat to human health, because of an astronomical rise in the rate of microcephaly cases in Brazil. Microcephaly is an uncommon birth defect where children are born with abnormally small heads and severe developmental problems.

The White House called for $1.9bn in Zika funding as early as February, but Congress was unable to pass a bill to fund efforts to combat the disease until late September. Earlier efforts were thwarted by so-called poison pills, such as riders that would have eliminated federal funding to Planned Parenthood and lifted a ban on Confederate flags in veterans' cemeteries.

Now, local transmission is widespread in Puerto Rico, and has flared up in Miami. More than 25,000 cases have been reported nationally, including more than 2,000 cases in pregnant women. The disease has also continued to surprise scientists, who recently reported that Zika was spread through sweat or tears in Utah, and that the virus lingers in

semen and saliva.
“We won’t be able to backfill for the cancer research we had to take from to keep things going,” said the health and human services secretary, Sylvia Burwell. “There was a reason we asked for the $1.9bn, and that was important uses of money.”
Officials said research into diagnostic tests and long-term impacts on children born to infected mothers of the disease were delayed because of congressional bickering.
Fauci called the congressional funding a “tried and true, but sometimes seriously delayed appropriations process”. He said that, “at least from our standpoint, [an emergency fund] is something that should be seriously considered.”

Double Dose of Pesticides Stops Zika Mosquitoes, CDC Says
NBC Newsby MAGGIE FOX and SAMUEL SARMIENTO, MD 23.9.16
It took a double dose of pesticides that kill both adult mosquitoes and their larvae to stop the first outbreak of Zika virus in Florida, health officials said Friday.
They said while aerial spraying of pesticides may be controversial and frightening to some people, they've shown it's safe when done right and that it killed off the mosquitoes that were spreading the virus.

An aerial banner is flown over the South Pointe Park pier on Sept. 6, 2016, in the South Pointe Park area in Miami Beach, Fla.

Aerial spraying of the insecticide naled is scheduled over South Beach, where more mosquitoes have tested positive for the Zika virus. In a statement Tuesday, Miami-Dade County Mayor Carlos Gimenez said the flights recommended by Florida health officials and the U.S. Centers for Disease Control and Prevention will begin Thursday and continue for a month. Alan Diaz / AP
"Aerial spraying is an effective addition to mosquito control on the ground. In fact, it's been the most effective tool," Dr. Tom Frieden, director of the Centers for Disease Control and Prevention, told NBC News.
Florida is still fighting a second outbreak in Miami Beach. There are also individual cases across the state. Three new local cases were reported Friday, bringing Florida's total count to 105 cases — 95 in residents and 10 among people infected while visiting the state.
The CDC and Florida's department of health on Monday declared the Zika outbreak over in Miami's Wynwood neighborhood. Thirty people who lived, worked or visited there had tested positive for Zika. Most had been in or around a work zone with many areas of standing water.
It took several weeks to get the outbreak under control, and aerial spraying of the pesticide naled, plus use of ground sprays that disperse larva-killing bacteria, is what ended the outbreak, the CDC says.
Officials started out using sprayers loaded with Bacillus thuringiensis israelensis (Bti), a species of bacteria that can kill developing insect larvae in water. It is sold in mosquito dunks and pellets that homeowners can buy to treat ponds or other standing water. It's effective but takes time to work.
Related: Activists Protest Mosquito Spraying in Miami Beach

"Despite extensive ground-based efforts, Zika continued to spread among people. As soon as aerial spraying was done, mosquitoes plummeted and transmission slowed," Frieden told reporters in a telephone briefing.
"Aerial application appears to be our strongest tool. Aerial spraying with Bti that controls the young mosquitoes and naled is currently the most effective tool in the Zika prevention toolbox."
But aerial spraying alone doesn't work, either, Frieden said. "In the areas that only used naled, mosquito populations rebounded," he said. "So the one-two punch is important."
The Aedes aegypti mosquito that carries Zika is especially hard to kill. Frieden likes to call it the "cockroach of mosquitoes" because it's so difficult to control. It lives in and around houses and can breed in tiny amounts of water.
Aedes spreads not only Zika, but dengue, yellow fever and chikungunya viruses. No one's been able to eradicate populations since governments stopped spraying DDT in the 1970s.
The CDC and state health department officials said the naled spray that was used is not dangerous to people when sprayed in ultra-low doses.
"Less than one ounce of naled per acre is used for aerial spraying, which might explain the absence of observed negative health effects during and after aerial spraying," they wrote in a joint report. Other studies have tested people after naled has been sprayed and find little evidence of it in their bodies.
Zika is a threat mostly because of what it does to developing babies. It attacks their brains and nervous systems, causing a wide range of birth defects, from horrific brain damage to subtler effects on vision. There's no way to protect a fetus if the mother is infected.
Travelers from other Zika-affected areas carry the virus with them — often unwittingly, because most people infected don't have symptoms. Zika can cause a rash, headache and fever and, rarely, it can cause neurological side-effects.
Zika can spread sexually but it only causes outbreaks where *Aedes aegypti* mosquitoes live.

Oriental

Thailand considers Zika tests for all pregnant women

WORLD NEWS | Mon Oct 3, 2016 By Amy Sawitta Lefevre and Panarat Thepgumpanat

A city worker fumigates the area to control the spread of mosquitoes at a temple in Bangkok, Thailand, September 14, 2016. REUTERS/Chaiwat Subprasom/File Photo

BANGKOK - Thailand is considering testing all pregnant women for Zika, the health ministry said on Monday, following confirmation last week of its first known cases of microcephaly, a birth defect marked by small head size, linked

to the Zika virus.

The two confirmed cases of microcephaly were the first in Southeast Asia linked to mosquito-borne Zika, which has been spreading in the region after outbreaks in the Americas.
"The health minister has asked us to study whether this is necessary and cost-effective," health ministry permanent secretary Sophon Mekthon told Reuters, referring to free tests for all pregnant women.
A Zika test costs about 2,000 baht ($58) but repeat tests are often needed, Sophon said.
"At the moment, we check pregnant women in Zika-affected areas only, not all pregnant women. So far, we've tested about 1,000 pregnant women."
Zika infections in pregnant women have been shown to cause microcephaly - a severe birth defect in which the head and brain are undersized - as well as other brain abnormalities.
The connection between Zika and microcephaly first came to light last year in Brazil, which has since confirmed more than 1,800 cases of microcephaly.
Thailand has confirmed 392 Zika cases since January, including 39 pregnant women, and Singapore has recorded 393 Zika cases, including 16 pregnant women.
The U.S. Centers for Disease Control and Prevention has said people should consider postponing travel to Brunei, Myanmar, Cambodia, Indonesia, Laos, Malaysia, Maldives, Philippines, Thailand, East Timor, and Vietnam.
The CDC has already issued a "travel notice" for Singapore.
There is no vaccine or treatment and an estimated 80 percent of people infected with Zika have no symptoms, making it difficult for pregnant women to know whether they have been infected.
Sexual transmission of the virus has also been reported.
Zika testing is free in Singapore for pregnant women with symptoms of the virus or with male partners who are Zika-positive. Pregnant women without symptoms get subsidized tests.
The Philippines, Malaysia, Vietnam and Indonesia have all reported at least one case.
In adults, Zika infections have also been linked to a rare neurological syndrome known as Guillain-Barre, as well as other neurological disorders.

Revolution in fight against invading Zika virus mosquitoes
Brisbane times SEPTEMBER 8 2016 Jorge Branco
Scientists working to safeguard south-east Queensland from mosquitoes carrying the dangerous dengue and Zika viruses have developed a new trick they hope will revolutionise their efforts.
The mosquito in question is common in much of the state's north, where emergency responses to dengue outbreaks are an annual occurrence.
There's been little sign of the disease magnet in the south-east corner outside of Brisbane airport since the 1950s but the current testing regime is far from exhaustive, according to one expert behind the testing breakthrough.
Queensland Health medical entomologist Brian Montgomery said there were about 40 testing sites across all of Brisbane, each capable of picking up the Aedes Aegypti mosquito within only one or two hundred metres, leaving massive gaps.
Brian Montgomery's mosquito testing regime would require residents to take possession of egg traps to collect mosquito larvae.
His end goal, made possible by world-first DNA testing adopted from a medical diagnostic

check, was to have a monitoring station on every city block, with help from everyday citizens.

To date, testing for the invasive pests, common in much of the world but fortunately scarce in most of Australia, consisted of catching eggs or adult mosquitoes and examining them painstakingly under a microscope.

But Mr Montgomery's new technique, developed in conjunction with Queensland Health forensic and scientific services, Brisbane City Council and the Metro South Public Health Unit, allowed lab experts to test 5000 mosquitoes at once and detect a single foreign variety in the group.

"So it's a whole new way of being able to get the result much more quickly than we previously could," he said.

"What you historically would do is, if you could imagine how many mosquito wrigglers you might be extracting out of a single property, you could actually get thousands from a single container. So typically that would then come back to a laboratory and somebody would have to sit and look at all of those specimens under a microscope and that can take many many hours to go through the larvae for a single property."

One of the egg traps used to collect mosquito larvae.

Even with all of that work, there was still a real risk of missing the mosquito if it was in the early stages of invasion or testing at the wrong time, he said, hoping to blanket the sitting in a comprehensive testing regime in the future.

Dengue causes sudden onset fever, extreme tiredness, muscle and joint pain, intense headaches and many other symptoms.

Zika is similar but generally considered much milder and brings with it the added risk for pregnant women of microcephaly, which causes babies to be born with small heads and underdeveloped brains.

The easiest way to protect against the disease is to avoid getting bitten by an infected mosquito, making work to keep the specific vector out of SEQ critical.

The Metro South Hospital and Health Service is asking for expressions of interest from the public in helping out with a pilot program, with the aim to roll out the new testing wider if successful. They would have to agree to have an egg collection kit sit in their backyard for about two weeks before sending it back in.

There were 31 identified cases of Zika and 367 dengue infections in Queensland to September 4.

ZIKA - MOSQUITO TECHNOLOGY

App tracks Zika by enlisting the help of 'citizen scientists'

Once a week, Kidenga has users report mosquito activity in their area

10/03/2016 | ConsumerAffairs | Health twitter By Sarah D. Young

Want to help public health investigators come up with new ways to fight the Zika virus? Now you can, with Kidenga -- a free app for iOS and Android devices.

The "community-based disease detection system" asks users to report their symptoms as well as mosquito activity in their area. In doing so, citizens may be able to help health

experts better track and detect Zika outbreaks.

In addition to tracking “day-biting mosquito populations within a community,” the app keeps users current on confirmed cases of Zika within their community. Kidenga also provides important information on preventing mosquito-borne diseases.

‘Early alert is critical’ Photo (c) nito - Fotolia

Kacey Ernst, an infectious disease epidemiologist at the College of Public Health, said the app’s use of ZIP codes may help experts zero in on areas that “appear to have an uptick of suspicious symptoms," which may hint at cases of dengue, chikungunya, and Zika.

“This early alert is critical to reduce or prevent further spread of the virus," Ernst said in a statement.

Apps like Kidenga and other tools for self-reporting could be especially vital, as not everyone will see a physician if their symptoms are mild. People may be more likely to report symptoms if it can be done on their smartphone.

"Click a button that says everyone is healthy and say whether or not you noticed mosquitoes in your area, and you're done." Ernst told News4 Tuscon.

Arizona, Florida, Texas

Currently, researchers are focused on having the app used in states with high populations of *Aedes* mosquitoes, such as Arizona, Florida, and Texas. Controlling populations of *Aedes aegypti* in states like these, where the climate is humid and subtropical, is no easy task. Ernst says reducing transmission risk "requires buy-in ranging from grassroots community initiatives to government-operated programs," adding that the app may help. "With more information, we hope that more people will join the fight to control these mosquitoes." The app was developed by researchers from the University of Arizona’s Mel and Enid Zuckerman College of Public Health.

ZIKA - DID YOU KNOW?

Will Frost Kill Zika Mosquito Eggs? They Could Survive The Cold

JEN MCGUIRE September 2016

Christopher Furlong/Getty Images News/Getty Images

It's hard to remember a time when there was no such thing as the Zika virus. As the virus spread through the bite of an infected *Aedes aegypti*-variety mosquito, news of the Zika virus too began spreading through social media, creating chaos and confusion. For many people, the summer was spent nervously testing insect repellents and wearing long sleeves while avoiding any standing water, a breeding ground for mosquitoes. Now that summer is coming to an end and winter is around the corner, will people be able to relax? Will the frost kill off Zika mosquito eggs and hopefully curtail the spread of the Zika virus?

Scientists have found that the female *Aedes aegypti* mosquitoes can pass the virus along to their offspring. The Zika mosquito eggs can easily withstand the winter, and possibly

hatch in the spring during the seasonal rains. According to researcher Robert Tesh of the University of Texas Medical Branch in Galveston:

[Transmission to offspring] is a mechanism to allow the virus to survive from one season to another. This is one way for the virus to survive when there are no adult mosquitoes.

In a study performed by the University of Texas Medical Branch, Tesh found that infected *Aedes aegypti* females passed the virus down to their offspring at a rate of one in 290:

I think what it means is it's a way for the virus to overwinter. Here in Galveston, it's still quite warm now. We have *Ae. aegypti.* In October it'll start to get cool. But their eggs survive the winter. In April or March it'll start to warm up again and we'll get rain. The containers where the eggs are will fill with water, and you'll have another generation of mosquitoes. If even just a few of those eggs are infected, when the larvae hatch, they're also infected. While Tesh conceded that a transmission rate of approximately one in 290 is relatively low, he pointed out that trying to destroy mosquito eggs could be infinitely more difficult than killing off an adult mosquito. For instance, spraying does not work on mosquito eggs because larvicides "don't necessarily kill the eggs, because they're often in protected places, and the eggshell of the Aedes is quite resistant."

As Tesh also points out, "They're so tiny, if they're on a dark surface, you won't see them." Health authorities continue their efforts to eliminate the mosquito-borne Zika virus, currently of which there is no no cure or vaccine.

One solution that the FDA has approved is the possibility of genetically modified mosquitoes, who will breed with other mosquitoes and create offspring that won't survive. Derrick Nimmo, senior scientist at Oxitec, a company awaiting approval to release these genetically-modified mosquitoes in Key West, Florida, explained to The Atlantic in an email: Since *Aedes aegypti* eggs can lie dormant for over six months and hatch at any time, the Oxitec solution, as with any vector control solution, may require repeat releases to maintain the suppression of populations of *Aedes aegypti.*

As of yet, there is no vaccine to protect against the Zika virus, and no cure. While most healthy adults will only suffer minor, flu-like symptoms, pregnant women could possibly transfer the virus in utero, which could cause a whole host of neurological disorders like microcephaly, a condition where the brain does not grow to full size.

Men with vasectomies can still spread Zika via sex, report suggests

Live Science By Rachael Rettner September 23, 2016

A man in Spain may have passed the Zika virus to his wife through sex, even though he'd previously had a vasectomy, according to a new report of the case.

The 53-year-old man and his 51-year-old wife had gone on vacation to the Maldives islands in the Indian Ocean in early February this year, the report said. They spent 10 days on the islands, and returned to Madrid in mid-February. They both got mosquito bites on the trip.

A few days after their return, the man developed symptoms of Zika infection, including a fever, rash, headache and joint pain, which went away after about a week. When the man had nearly completely recovered from the infection, the couple had unprotected sexual intercourse.

In men who've undergone a vasectomy, sperm from the testes cannot make their way into semen. These men still ejaculate semen during sex, but the semen contains no sperm. (Sperm are men's reproductive cells, whereas semen is usually a mixture of sperm and other fluids.)

A week later, (which was two weeks after the man first showed symptoms), the woman also developed symptoms of Zika.

Doctors tested blood and urine samples from the husband and wife, as well as the

husband's semen. The woman's urine sample tested positive for Zika virus, as did the man's semen sample.

It's likely that the man became infected from a mosquito bite he got when the couple was in the Maldives. Zika is primarily transmitted by mosquitoes, and mosquitoes infected with Zika are known to be present in the Maldives, according to the Centers for Disease Control and Prevention.

But the woman didn't develop symptoms until 18 days after she returned from the trip. For a Zika virus infection, this incubation period (or the time it takes a person to show symptoms after he or she is infected) would be "exceptionally long," the researchers said. It's thought that the incubation period for Zika is between three and 12 days, according to the European Centre for Disease Prevention and Control.

It's unlikely that the woman was infected by a mosquito bite she got in the Maldives, and this means that sexual transmission "is definitely a possibility" in the woman's case, the report said. It's the first time that possible sexual transmission of Zika virus from a man with a vasectomy has been reported, the report said.

Doctors were able to detect infectious Zika virus in the man's semen up to 69 days after he first showed symptoms. This is the longest time period that infectious Zika virus has been detected in semen, the report said.

This case suggests that, rather than hiding exclusively in sperm, the Zika virus may be present in other fluids that make up semen, such as fluid from male reproductive glands, or pre-ejaculate secretions, the report said.

"Public health recommendations to prevent sexual transmission of Zika virus should take these data into consideration," and should recommend use of protection during sex after travel to an area with Zika, even if a man has had a vasectomy, the report said.

The World Health Organization currently recommends that men and women returning from areas with Zika transmission should use protection for at least six months after their return.