NEW ZEALAND BIOSECURE

BORDER HEALTH NEWSLETTER – December 2015

WELCOME!

Hi everybody,

We hope you all have had a great Christmas and a very good start for 2016. Weather was great over the break in Wellington and after an average start to summer this was a delight! Of the six main centres for 2015, Auckland was the warmest, Tauranga was the sunniest, Christchurch was the driest, Hamilton was the wettest and cloudiest, and Dunedin was the coldest. 2015 was also a particularly dry year for New Zealand with many places setting records for high temperatures and sunshine hours, and rainfall levels were well below average for much of the country due to the influence of the El Nino weather pattern. More than forty interceptions were reported during 2015 however only six were confirmed exotic species. POE surveillance continues throughout New Zealand and it has been a pleasure working with everyone to ensure the baddies don't breach our borders. We look forward to another great year.

Species	Adults		Larvae	
New Zealand Mozzies	**Dec 15**	**Dec 14**	**Dec 15**	**Dec 14**
Aedes antipodeus (winter mosquito)	8	27	Nil	Nil
Ae. notoscriptus (striped mosquito)	192	353	1715	892
Coquilletidea iracunda	26	23	Nil	Nil
Coq. tennuipalpis	1	2	Nil	Nil
Culex astilae	Nil	Nil	9	Nil
Cx pervigilans (vigilant mosquito)	45	11	2899	3155
Cx. quinquefasciatus (southern house mosquito)	90	34	657	101
Opifex fuscus (rockpool mosquito)	Nil	Nil	65	18
Total	**362**	**450**	**5345**	**4165**

SAMPLES

During December 913 samples were collected by staff from 12 DHBs with 218 positive. December is the month of *Culex pervigilans*: almost 3000 larvae is quite impressive. We are glad to see some more natives, such as *Coquilletidia sp.*

Interesting the Aedes notoscriptus numbers: we have had approximately double the number of larvae this year compared to the same time last year but only half of the adults. That might mean that we are one month behind when it comes to the right climate conditions for our introduced main (mosquito) actor.

INCURSIONS/INTERCEPTIONS

We have had three interceptions in November,:

9.12.2015: One female *Cx pervigilans* was found at MG Marketing Auckland in an empty MPI room.

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

11.12.2015: A flying mosquito was seen and photographed by MPI (photo confirmed a mosquito; likely to be *Culex. sp*) in a container from Vancouver, Canada with forestry machinery. During the subsequent delimiting survey *Cx pervigilans* and *Cx. quinquefasciatus* were caught. No specimens were found after fumigation.

28.12. One live female *Aedes aegypti* was caught by a MPI officer in the luggage inspection room at AIA after a flight from Japan.

29.12. Another live mosquito was founds at Fresh Max Auckland in a container with lemons and oranges from USA and was identified as a male *Cx. quinquefasciatus*.

PICTURES OF THE MONTH

Close-up of a man looking shocked with a mosquito flying above his head
Credit: Glowimages - stockphotos

STORIES OF THE MONTH

Pump action Bug-A-Salt takes down insects in a hail of table salt

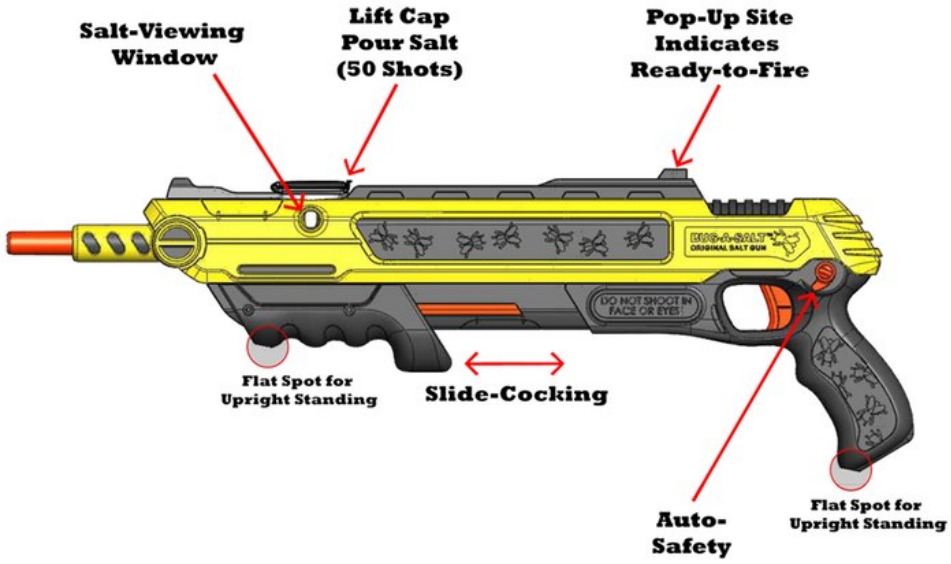
DARREN QUICK, JULY 25, 2012

Lorenzo Maggiore with his Bug-A-Salt pump action gun that finishes bugs off with a pinch of salt

Lorenzo Maggiore with his Bug-A-Salt pump action gun that finishes bugs off with a pinch of salt

We recently took a look at the InaTrap insect trap that lures insects into its designer-inspired form to quietly and efficiently send them to an early grave. But if you're looking for something slightly more badass that provides a greater sense of satisfaction when taking out those pesky bugs then it's hard to go past the Bug-A-Salt. The brainchild of Santa Monica-based artist Lorenzo Maggiore, the Bug-A-Salt is a pump action gun that takes out pests in a blast of non-toxic table salt.

The "insect eradication device" has an effective range of three to five feet (0.9 to 1.5 m) and holds enough salt for around 50 shots. Once filled via the loader cap on the top, the gun is primed by pumping the handgrip. This activates the pop-up sight for taking aim and the auto-safety, which needs to be manually disengaged before firing. This is because firing it into someone's face is likely to sting quite a bit and could potentially damage an eye.



The Bug-A-Salt fires just a pinch of salt (no batteries required) with enough force to kill a fly, while still leaving it intact. This makes it easy to dispose of the remains or, now that the fly is a little more tasty, maybe enjoy a snack – or not. Either way, the use of salt as the projectile means you can fire away with gay abandon around food, which isn't possible with toxic fly sprays. Not to mention, shooting the insects is bound to be much more fun.

Maggiore has finalized the design of the Bug-A-Salt and has turned to crowdfunding site indiegogo to cover manufacturing and shipping costs. With 48 days still remaining, the project has well and truly surpassed its US$15,000 goal with a total of over $89,000 raised so far. Contributions start at $30, which will entitle you to one Bug-A-Salt, and range up to a $2,500 "Arms Dealer" tier that secures you an arsenal of 144 Bug-A-Salts.

The Bug-A-Salt can be seen in action in Maggiore's indigogo video pitch video below.

Sources: Bug-A-Salt & indiegogo via reddit

CHIKUNGUNYA

Chikungunya: 12th locally acquired case in Florida in 2014 now reported

Posted by Robert Herriman on December 22, 2015

Outbreak News Today

The Centers for Disease Control and Prevention (CDC) updated their Chikungunya web page on Oct. 30 with an interesting piece of information–the number of autochthonous, or locally acquired chikungunya cases changed from 11 in Florida (and the US as a whole in 2014) to twelve.
Outbreak News Today reached out to the Florida Department of Health (DOH) for a statement and Deputy Press Secretary, Brad Dalton responded via email: The 12th case took some time to obtain convalescent samples to confirm the results. As for all suspect local or imported cases, local response was initiated immediately and the county was already under a mosquito-borne disease alert at the time. The case will be included in our 2014 annual report which should be posted very soon.
In 2014, a total of 2,811 chikungunya virus disease cases were reported to ArboNET from U.S. states for 2014, including the 12 autochthonous cases from Florida. New York reported the most travel-associated cases with 803, followed by Florida with 475.
In 2015 to date, the numbers are down significantly. As of December 16, 2015, a total of 653 chikungunya virus disease cases have been reported to ArboNET from 44 U.S. states for 2015. All reported cases occurred in travelers returning from affected areas. No locally-transmitted cases have been reported from U.S. states. Florida has reported only 67 cases to date.
Chikungunya is a viral disease transmitted by the bite of infected mosquitoes such as Aedes aegypti and Aedes albopictus. It can cause high fever, join and muscle pain, and headache. Chikungunya does not often result in death, but the joint pain may last for months or years and may become a cause of chronic pain and disability. There is no specific treatment for chikungunya infection, nor any vaccine to prevent it. Pending the development of a new vaccine, the only effective means of prevention is to protect individuals against mosquito bites.

DENGUE

Hawaii

Dengue cases rise in Hawaii, Protecting against mosquito bites
Outbreak News Today
Posted by Robert Herriman on December 31, 2015

After a couple days lull in reported dengue fever infection reported on Big Island, the Hawaii Department of Health (HDOH) reported eight additional cases on Wednesday, bringing the outbreak total to 190. The vast majority of cases have been reported in Hawaii residents with about one out of 10 being seen in visitors to the Aloha State.
Dengue Fever is a virus that is transmitted from an infected person to a mosquito, which can then infect another person. The HDOH says in Hawaii, the *Aedes aegypti* (Yellow Fever Mosquito) and *Aedes albopictus* (Asian Tiger Mosquito or Forest Day Mosquito) carry the dengue virus. Other *Aedes* members can transmit dengue, but are not found in Hawaii. These mosquitoes are most active in the early morning after daybreak and the late afternoon before sunset.
Aedes albopictus adults usually rest out of doors, in places such as in bushes, but they can be found indoors in houses and other dwellings. *Aedes aegypti* are most commonly found indoors, and only occasionally outdoors in garden vegetation. These mosquitoes travel less than 200 yards.

Orientalis

Philippines plans to vaccinate against dengue fever

Outbreak News Today

Posted by Robert Herriman on January 6, 2016

The Philippines government made an important announcement this week concerning the prevention of a major infectious disease that is a big problem on the archipelago.

With the announcement two weeks ago of the new dengue fever vaccine, Dengvaxia, by the FDA, government officials say susceptible poor children in regions with high incidence of dengue will be the first beneficiaries of the government-procured dengue vaccine.

Dengue fever, a mosquito borne viral disease with potentially serious consequences, particularly in the young, is a problem in the Philippines. In 2013, Department of Health (DOH) reported 204,906 cases of dengue, the highest number recorded since the establishment of the National Dengue Prevention and Control Program in 1993 and was 62.7% higher than the 5-year median cases.

While the number of cases dropped to about 106,000 cases in 2014, the data from the first 11 months of 2015 reveals that some 170,000 cases and more than 500 deaths were reported through Nov. 21.

Health Secretary Janette Garin said President Benigno Aquino III approved the provision of dengue vaccine to 1,077,623 9-year-old Filipino children who are currently enrolled in government schools in the hardest hit regions of the National Capital Region, Region III (Central Luzon), and Region IV-A (Calabarzon), according to local media.

And, if the results of a recent study are on target, the administration of the dengue vaccines should produce. In the recent unpublished cost-effectiveness study done by Professor Hilton Lam of the University of the Philippines-National Institutes of Health, a nationwide annual routine vaccination of 9-year olds starting in 2016 will lead to an estimated 24.2% reduction in dengue cases over a 5-year time horizon, translating to 775,053 cases avoided, 502,000 avoided hospitalization, 22,010 avoided deaths, and almost 21 billion avoided cost to society.

SMC ready to use 'mosquito magnets' against *Aedes* mosquitoes

NEW STRAITS TIMES

10 JANUARY 2016 by PM Bernama

SIBU: The Sibu Municipal Council (SMC) is ready to use ‘Mosquito Magnets’ to combat the *Aedes* mosquito in the town, which accounts for over 70 per cent of the total number of dengue cases in Sarawak. Its deputy chairman Datuk Andrew Wong said an analysis conducted by the University of Malaya on the special equipment recently showed it was very efficient for use. Apart from that, he said, the results of the analysis which also included field studies involving the installation of the equipment at schools and parks in the town, would be made public soon. Speaking to reporters after the SMC’s Annual Dinner here last night, he said the analysis report would be submitted to the Sarawak Local Government and Community Development Minister Datuk Seri Wong Soon Koh. He said SMC would also request for a RM500,000 allocation from the government to install more of such equipment in schools and public parks in the city.

A researcher looks at Aedes aegypti mosquitoes kept in a container at a lab of the Institute of Biomedical Sciences of the Sao Paulo University in Sao Paulo, Brazil. Sibu Municipal Council (SMC) is ready to use ‘Mosquito Magnets’ to combat the Aedes mosquito in the

town, which accounts for over 70 per cent of the total number of dengue cases in Sarawak.

Americas

Mexico: 50 percent of confirmed dengue seen in Veracruz, Sonora, Jalisco, Guerrero and Michoacán in 2015

Outbreak News Today

Posted by Robert Herriman on January 10, 2016

The actual number of confirmed dengue fever cases were down in 2015 compared to the previous year, according to data published by the General Director of Epidemiology at the Mexican Health Ministry.

There were 21,201 confirmed dengue fever cases, 5,464 confirmed cases of dengue hemorrhagic fever and 42 dengue related fatalities in 2015, all down from 2014 when the numbers were 23,374, 8,647 and 76, respectively.

In 2015, 50% of cases were from the following five states: Veracruz, Sonora, Jalisco, Guerrero and Michoacan.

Six out of 10 dengue fever cases were reported in women.

However, in terms of probable dengue fever cases (defined as a person who has a fever or history of fever for 2-7 days duration, two or more symptoms of dengue and one serological test positive or epidemiological nexus with confirmed dengue case 14 days before onset of symptoms, according to the Pan American Health Organization), the numbers in 2015 were up dramatically.

Through the 52 epidemiological weeks of 2015, 219,593 probable dengue fever cases were reported, up from 124,505 cases in 2014. Veracruz, Jalisco and Colima states each reporting in excess of 20,000 probable dengue cases.

The World Health Organization (WHO) estimates there may be 50–100 million dengue infections worldwide every year. However, new research from the University of Oxford and the Wellcome Trust, using cartographic approaches, estimate there to be 390 million dengue infections per year worldwide.

Aedes aegypti/CDC

ZIKA

Americas

Colombia reports an average of 1360 Zika virus cases weekly in past 5 weeks

Outbreak News Today

Posted by Robert Herriman on January 10, 2016

Since the first local transmission of human Zika virus infection in Colombia three months ago, the country has seen 11,712 laboratory confirmed, clinically confirmed and suspect Zika caes, according to health officials in the last epidemiological update of 2015.

Colombia/CIA

Colombia has reported an average of 1,360 cases per week during the past five weeks with 1658 cases being the highest reported two weeks ago.

Cases have been confirmed by laboratory in 163 municipalities country, of which 78 (47.85%) correspond to the Central Region and 29 (17.79%) for the Caribbean region.
Nearly 300 pregnant women have been called Zika positive from 23 local authorities and 58 municipalities. The 297 women were classified as clinically confirmed (218), suspected (70) and confirmed by PCR (9).

Martinique preps for Zika epidemic; 150 suspected cases seen in last week of 2015
Outbreak News Today
Posted by Robert Herriman on January 9, 2016

Autochthonous, or local transmission of Zika virus on the Lesser Antilles Caribbean island of Martinique was first confirmed in late December. As of today, health officials report 12 confirmed cases prompting the government to enter into Phase 2 of the monitoring program, warning and outbreak management, one that precedes the epidemic.
“Since we know that the virus is circulating in Brazil, we have implemented heightened surveillance for the West Indies and Guiana to detect early cases. We are relying on doctors and laboratories. In mid-December, we moved into another phase, enhanced surveillance, after the first confirmed cases, “says Martine Ledrans, head of interregional Epidemiology Unit (CIRE) Antilles-Guyane.
In addition to the 12 locally transmitted cases, monitoring by sentinel physicians has estimated that around 150 suspected cases were seen in consultation for the week of December 28 to January 3. The cases located in the same areas as those of the first 12 laboratory confirmed cases. The confirmed cases have been detected in the following areas: Schoelcher (3), Fort-de-France (1), Lamentin (1) , Robert (5), Sainte-Luce (1) and Trinity (1).

A virus linked to shrinking newborns’ brains is spreading rapidly beyond Brazil
QUARTZ
Akshat Rathi January 03, 2016

Marred for life. (AP Photo/Felipe Dana)

Until 2014, Brazil had no more than 200 cases of microcephaly, a debilitating neurological disorder where newborns have an abnormally small brain. In 2015, the country recorded nearly 3,000 cases. Some of the worst affected areas have declared a state of emergency.

Many born with microcephaly die young. Those who survive have life-long cognitive impairment. To understand the sudden rise, in November, the country's health ministry drew a link to an epidemic of Zika virus that began in early 2015.

Zika virus is transmitted by mosquitoes, and it was first detected in Uganda in the 1940s. After spreading through Africa and parts of Asia, it has made its way to Latin America. There is no known vaccine to prevent or medicine to treat the disease caused by the virus.

Since May 2015, the Brazilian government estimates that some 1.5 million people have been infected with the virus. In children and adults, the infection is mostly benign: some suffer from fever and red rashes, while others may be symptomless.

However, after finding the virus in the placenta of children born with microcephaly, Brazilian doctors have been warning women to delay their pregnancy if at all possible. "Most" mothers of microcephalic children, according to CNN, had Zika-like symptoms early in their pregnancy.

There is no known physiological basis for how Zika virus can cause microcephaly, and previous epidemics do not help make the case. A 2007 outbreak on Yap Islands in Micronesia is estimated to have affected nearly 75% of the population of some 12,000 people, and a 2013 outbreak in French Polynesia affected nearly 28,000 of 270,000 residents. Neither epidemics caused a spike in microcephaly.

An explanation for the link may be that a new strain of the virus is spreading through Brazil, according to Alain Kohl, a virologist at the University of Glasgow who studies Zika. Still, even for the fastest evolving organism on the planet, acquiring completely new powers of devastation is rare.

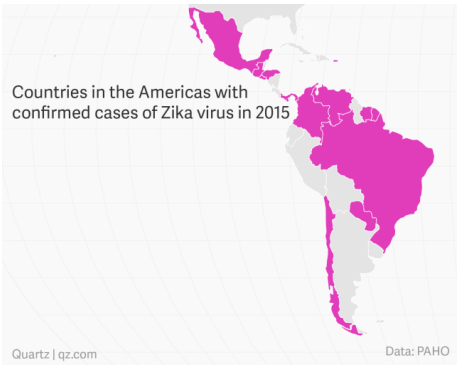
A more likely explanation is that the link has simply gone unnoticed so far. It may be that Zika-induced microcephaly occurs only in a small proportion of pregnant women, and none of the previous epidemics have affected a large enough population to raise an alarm.

Before the Zika epidemic began, Brazil was already dealing with a dengue epidemic spread by the same mosquito (Aedes aegypti) that is responsible for spreading the Zika virus. In

2015, the country recorded 1.6 million cases of dengue, nearly three times as many as that in the previous year.

"Brazil offers the ideal conditions for Zika to spread so quickly," Ana Maria Bispo de Filippis, a leader of the research team that has linked Zika to microcephaly, told the New York Times. "It has a susceptible population in which the majority of people never had contact with the disease." The country's political situation isn't helping. The president, Dilma Rousseff, is fighting impeachment proceedings, and she has been criticized for her weak response to the Zika epidemic. And to make matters worse, the rainy season between January and May almost always sees a spike in mosquito-borne diseases.

Zika virus is also spreading quickly. By October cases had been reported in Colombia, El Salvador, Guatemala, Mexico, Paraguay, Panama, Suriname, and Venezuela. The region to fall victim this week is Puerto Rico.



Zika viruses has been found in the US among travelers who have been to affected regions, but there is as yet no locally transmitted case there. With no treatments or preventative medicine at hand, the US Centers for Disease Control and Prevention's suggestion is to follow steps to prevent mosquito bites: carry insect-repellent creams, wear long sleeves and pants, sleep in air-conditioned rooms or behind windows with screens.

Zika outbreak expands in West Africa, Americas

MPH - CIDRAP Cape Verde reports outbreak

Dec 22, 2015 by Natalie Vestin

In the latest developments of an ever-expanding outbreak of Zika virus infections, the West African nation of Cape Verde reported its first illnesses, while Panama and Honduras confirmed additional cases.

The World Health Organization (WHO) yesterday reported that it had received notification of an outbreak in the nation of Cape Verde of the mosquito-borne disease.

The country notified the WHO of the outbreak on Oct 21, and 4,744 suspected cases have been reported through Dec 6 on the Cape Verde islands off the coast of West Africa. The earliest onset of symptoms occurred on Sept 27.

Fully 81% of suspected cases have occurred in the municipality of Praia on Santiago Island. The islands of Maio, Fogo, and Boa Vista have also reported cases. No neurologic complications have been observed, the WHO said.

Of 64 suspected case samples sent to the Institute Pasteur in Dakar, Senegal, 17 tested positive for Zika virus, which is spread by Aedes mosquitoes. Cape Verde officials continue to work with the Institute Pasteur to investigate virus circulation and vector tracking on the islands.

Additional response efforts include strengthening surveillance and laboratory capabilities and mosquito control. Cape Verde officials are also monitoring about 30 pregnant women infected with Zika virus for microcephaly and neurologic complications. Microcephaly, in which infants are born with smaller-than normal heads and brains, has been reported elsewhere in the Americas.

Panama now has 4 cases

The WHO reported today on a laboratory-confirmed case of Zika infection, bringing the

country's total of confirmed cases to four.
All four confirmed case-patients are women between the ages of 25 and 57.
Officials in Panama have also reported 95 suspected cases of Zika virus infection, four of which have tested positive for dengue virus, indicating community co-circulation of the illnesses that are both spread by Aedes mosquitoes. All 95 suspected cases have occurred in Guna Yala province, which is independently governed by the indigenous Guna people.
Most suspected cases have occurred in young people from 25 to 34 years, and 66% of patients suspected to be infected with Zika virus are female.
In response to the confirmed and suspected cases, Panamanian and Guna health officials are conducting vector-control and multilingual risk communication activities.
Infections in Honduras locally acquired
The WHO in a separate update yesterday said that Honduras's first two cases of Zika virus infection were locally acquired.
Both cases were laboratory-confirmed and occurred in men who live in the southern region of country. Because of the Zika outbreak currently affecting the Americas, the WHO continues to call for increased vector control and surveillance efforts in the region.

Europe

Netherlands: Imported Zika infection via Suriname
Outbreak News Today
Posted by Robert Herriman on December 13, 2015

We have seen imported Zika virus infection in several countries over the recent past in Australia, Germany, Canada and Japan due to travel to areas where Zika is endemic (eg. Thailand) or where there was an active outbreak (eg French Polynesia) so it should no surprise to see travel-associated Zika due to travel to Latin America, where autochthonous Zika has been reported in at least nine countries this year.
Now, thanks to a ProMED Mail post today, we learn of a travel-associated Zika infection in the Netherlands in a person who traveled to Suriname (one of the nine countries mentioned above).
According to the report provided by the Center of Tropical and Travel Medicine in Amsterdam, the case was confirmed in a 60-year-old and otherwise healthy female patient, who had returned from Suriname on 29 Nov 2015, following a 3-week holiday.
Upon return to the Netherlands, she developed fever, itching in the hands and a red skin rash on the face, neck, trunk and extremities. The skin was painful upon touch and the joints of her fingers and ankles felt stiff. She also reported swelling of both lower legs. She reported multiple insect bites. She presented at our outpatient clinic at the AMC in Amsterdam, the Netherlands, on 2 Dec 2015, the 3rd day of her illness.
Physical examination showed an afebrile patient who was not acutely ill. She had a pronounced macular skin rash of her trunk, extremities, neck and face, as well as a marked conjunctival injection. In addition, she had pitting edema on both lower legs.
One day after her initial presentation, the skin rash had improved markedly. She recovered quickly. Upon follow-up on 11 Dec 2015, her only complaints were arthralgias that seemed to further improve.
The clinical diagnosis of Zika virus infection was confirmed by PCR (Erasmus MC, Rotterdam), on a sample taken on 2 Dec 2015 (the 3rd day of illness).
Last week, the US Centers for Disease Control and Prevention (CDC) issued travel notices for the affected countries.

The European Centre for Disease Prevention and Control (ECDC) in a Rapid Risk Assessment last week noted:
Few travel-associated cases of Zika virus infections have been reported in the EU. Infections followed exposure in Asia or in French Polynesia (as noted above- my addition). With the spread of the Zika virus epidemic in the Americas, the likelihood of travel-related cases of Zika virus infection in the EU is increasing.
The Aedes albopictus mosquito species is established in many parts of the EU, primarily around the Mediterranean. Onward transmission from imported cases within the continental EU is possible because Aedes albopictus is probably a competent vector for the transmission of Zika virus, even though this has not been confirmed for European mosquito populations. The risk for transmission of Zika virus infections is extremely low in the EU during winter season as the climatic conditions are not suitable for the activity of potential vectors.

Worldwide

Zika virus spreading through mosquito bites, CDC says outbreak is 'likely'
MGN Online
January 6, 2016 By Jaime Ritter

(WIAT) — According to the CDC, a locally-transmitted case of the Zika virus was detected in Puerto Rico. Local transmission of Zika means that mosquitoes in Puerto Rico have been infected with the virus and are spreading it to humans.
Common symptoms of Zika include fever, rash, joint pain, and conjunctivitis (red eyes). Symptoms typically last less than a week, but there is a serious link between pregnant women and birth defects.
The CDC says, "Because the Aedes species mosquitoes that spread Zika virus are found throughout the world, it is likely that outbreaks will spread to new countries."
There is no vaccine to prevent or treat Zika, but health experts recommend protecting yourself against mosquito bites by wearing long-sleeved shirts and pants; using insect repellent with high concentrations of DEET, Picaridin, Oil of lemon eucalyptus, or IR3535; use permethrin-treated clothing and gear; and sleeping in screened-in or air-conditioned rooms.

Yellow Fever

Africa

Ghana issues yellow fever alert, 3 dead
Outbreak News Today
Posted by Robert Herriman on January 8, 2016

An outbreak of the mosquito borne viral disease, yellow fever, has killed three people to date in the West Gonga District of northern Ghana in West Africa, according to local media reports.
The outbreak that started several weeks ago, prompted health officials to issue a health alert and has affected at least of dozen people. Health officials now say the outbreak is under control.
Ghana Public Relations Officer, Tony Goodman said, "We have dispatched officers from the

national and the regional level to the various districts to be able to contain the disease. The disease has been contained for about some ten days now we have not recorded any new case."

According to the US Centers for Disease Control and Prevention, Yellow fever virus is found in tropical and subtropical areas in South America and Africa. The virus is transmitted to people by the bite of an infected mosquito.

The majority of persons infected with yellow fever virus have no illness or only mild illness. In persons who develop symptoms, the incubation period (time from infection until illness) is typically 3–6 days. The initial symptoms include sudden onset of fever, chills, severe headache, back pain, general body aches, nausea, and vomiting, fatigue, and weakness. Most persons improve after the initial presentation.

After a brief remission of hours to a day, roughly 15% of cases progress to develop a more severe form of the disease. The severe form is characterized by high fever, jaundice, bleeding, and eventually shock and failure of multiple organs.

There is no specific treatment for yellow fever; care is based on symptoms. Steps to prevent yellow fever virus infection include using insect repellent, wearing protective clothing, and getting vaccinated.

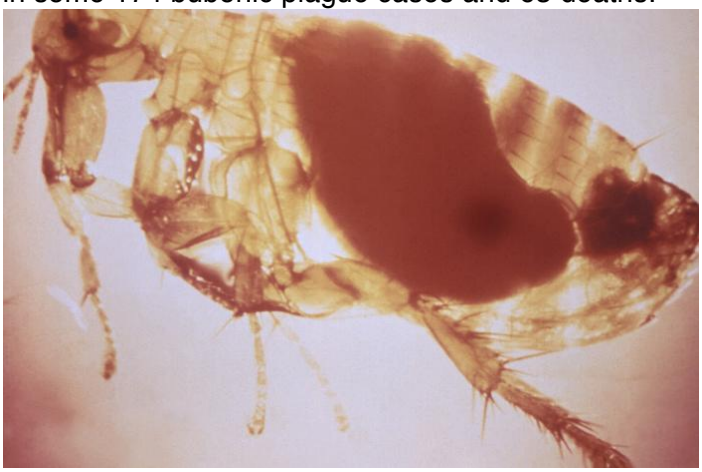
NOT ONLY MOSQUITOES

Plague death toll in Madagascar reaches 63

Outbreak News Today

Posted by Robert Herriman on January 9, 2016

Plague outbreaks occur annually on the island country of Madagascar and 2015 was no different. Health officials said Thursday that the outbreak that began in August has resulted in some 174 bubonic plague cases and 63 deaths.



Oriental rat flea, Xenopsylla cheopis/CDC

At least 79 people died after an outbreak in 2014 that continued into early 2015, when at least 335 cases were reported, according to the World Health Organization (WHO).

In fact, WHO said in late 2014, "the plague is endemic in the country, with epidemic seasonal peaks ranging from September to March."

Plague, a disease many think of as something from the history books, is alive and well in many areas of the globe and is clearly not stranger to Madagascar. It's not a disease from the Justinian period or the Middle Ages.

The most recent plague epidemics have been reported in India during the first half of the 20th century, and in Vietnam during wartime in the 1960s and 1970s. Plague is now commonly found in sub-Saharan Africa and Madagascar, areas which now account for over 95% of reported cases, according to the CDC.

A study published in. The American Journal of Tropical Medicine and Hygiene in Sept 2013 noted 21,725 cases of human plague reported globally during the last decade (2000-2009), including 1,612 deaths, for a case-fatality rate of 7.4%.

Leading all countries with number of human plague cases was the Congo, which reported 10,581 during the decade. The author of the notes that all these occurred in the Oriental Province following years of civil strife and influxes of displaced persons.

Plague is an infectious disease caused by the bacterium, *Yersinia pestis.* It is found inanimals throughout the world, most commonly rats but other rodents like ground squirrels, prairie dogs, chipmunks, rabbits and voles. Fleas typically serve as the vector of plague. Human cases have been linked to the domestic cats and dogs that brought infected fleas into the house.

People can also get infected through direct contact with an infected animal, through inhalation and in the case of pneumonic plague, person to person.

Yersinia pestis is treatable with antibiotics if started early enough.

There are three forms of human plague; bubonic, septicemic and pneumonic.

Bubonic plague: This is the most common form. In this form, the bacteria enter the body through the bite of an infected flea or rodent. Here the bacteria infect the lymphatic system. After a few days to week, the person will experience fever, chills, weakness, and swollen lymph glands. These are called buboes.

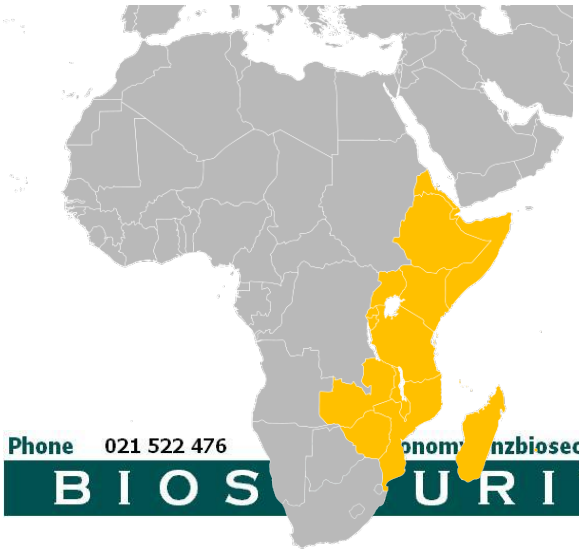
Untreated bubonic plague is fatal about half the time.

Septicemic plague: This form is also contracted from a flea or rodent bite. Sometimes it appears subsequent to untreated bubonic or pneumonic plague. It involves bloodstream dissemination to all areas of the body. Buboes do not occur. Symptoms are endotoxic shock and disseminated intravascular coagulation. Untreated septicemic plague is nearly always fatal.

Pneumonic plague: Probably the most serious form of plague and it's when the bacteria infect the lungs and cause pneumonia. It is contracted when the bacteria is inhaled (primary) or develops when bubonic or septicemic plague spreads to the lungs.

Pneumonic plague is contagious and can be transmitted person to person. It is highly communicable under appropriate climate conditions, overcrowding and cool temperatures. Untreated pneumonic plague is frequently fatal.

Rift Valley fever outbreaks in East Africa forecasted with El Niño



Outbreak News Today
Posted by Robert Herriman on January 7, 2016

Rift Valley Fever (RVF) is mosquito-borne virus that is endemic in parts of Africa. It primarily infects animals like sheep, cattle and goats and it can have an economic impact on a community due to the loss of livestock.

Last month, several federal health agencies

including the NOAA, USDA and the CDC released a report concerning the risk of RVF outbreaks in East Africa due to El Niño.

The NOAA says the current El Niño will likely peak during the Northern Hemisphere winter 2015-16 and end up being among the strongest El Niño episodes since 1950.

According to the Emerging Health Risk Notification, El Niño and Rift Valley fever (RVF) risk, east Africa, published 3 weeks ago, the several federal agencies developed a RVF outbreak forecasting model that uses satellite-derived data, drawing on the tight coupling between RVF activity and El Niño-driven flooding said it identified areas at risk for RVF

East Africa, Image/ Reubot

activity because of substantially elevated rainfall in Sudan, South Sudan, Ethiopia, Somalia, Kenya, and Tanzania noting assistance likely is needed to minimize RVF impacts in east Africa.

In addition to RVF effect on animals, humans can get infected through contact with infected animal blood or organs and through mosquito bites and the bites of blood-sucking flies.

The agencies offer the following recommendations concerning preparation in East Africa: Animal and human surveillance and health education, animal vaccination programs and vector control.

Following the Congo was Madagascar recording 7,182 cases. The island country was the leading country in plague occurrence during the previous decade, 1990-1999.

According to the general secretary of the Madagascar Ministry of Health, between 300 and 600 suspected cases are reported each year, with about 30 cases of pulmonary plague and 10 to 70 deaths.

WORLD OF MOSQUITO TECHNOLOGY

Researchers trap elusive male mosquitoes using siren song of females

ABC Far North By Mark Rigby

Thu 7 Jan 2016,

Professor Scott Ritchie is one of the co-authors of a recently-released paper highlighting the effectiveness of a male mosquito audio lure developed at James Cook University.
ABC Far North: Mark Rigby

Researchers at James Cook University (JCU) in Cairns have discovered a way to use the sound emitted by female *Aedes aegypti* mosquitoes to capture their otherwise elusive male counterparts.

By mimicking the sound of the female mosquito's wing beats — a frequency of 485 Hertz — and playing it through a speaker, JCU researchers are catching male mosquitoes in traps that once only caught females.

One of the study's lead researchers, Professor Scott Ritchie, said male mosquito antennae were fine tuned to the sound of the female's wing beats and were immediately drawn towards it.

"The males are attracted to the song of the female," he said.

"They can pick this up from some distance so they hear her coming and then they basically go and they chat her up."

The male mosquito lure is made from cheap and simple components including a circuit board that acts as an MP3 player, a battery pack and a speaker, but it is highly effective at attracting male mosquitoes into the trap.
ABC Far North: Mark Rigby

As known carriers of dengue fever, yellow fever and Ross River virus, *Aedes aegypti* mosquitoes have been studied intensively in recent years, but the ability to capture and study large amounts of males is being hailed as a breakthrough.

"There are projects where we're actually using males to control females," Professor Ritchie said.

We could even have it interspersed on the radio so that you could be listening to the cricket and catching mosquitoes at the same time.

In these projects, males are captured, sterilised and then released to unsuccessfully breed with female mosquitoes.

Professor Ritchie said there was future potential for this type of strategy to be used in conjunction with audio lure traps to control or even eradicate *Aedes aegypti* populations.

"If you had enough of these you might be able to trap them out," he said.

"Between the males and the females you might actually knock the population down quite a bit.

"We're not going there yet because it would probably take quite a few traps and quite a bit of money to do that."

The trap is yet to be refined enough for use by residents, who see annual outbreaks of dengue fever and other mosquito-borne diseases, but Professor Ritchie is hopeful for future applications.

"There could be a day where you had a trap that captured females and it had a little bit of background music that captured males," he said.

"We could even have it interspersed on the radio so that you could be listening to the cricket and catching mosquitoes at the same time."

WORLD OF MOSQUITO Science

Mosquitoes More Likely to Lay Eggs in Water Sources Near Flowers

January 5, 2016 by Entomology Today
By Josh Lancette

Certain mosquitoes are more likely to lay eggs in water sources near flowers than in water sources without flowers, according to an article published in the Journal of Medical Entomology.

Researchers from the USDA and the University of Florida studied the Asian tiger mosquito (*Aedes albopictus*) and its egg-laying preferences. This mosquito is known to transmit yellow fever, dengue, and chikungunya, and it has been spreading throughout the United States.

Asian tiger mosquitoes prefer to lay eggs in containers. In fact, it is believed that they made it to the U.S. as stowaways in tires that were imported from Japan back in 1985. So the first thing the scientists decided to test was whether the size of the containers made any difference. They were also curious about whether or not the presence of flowers might affect the egg-laying behavior.

Flowers? "Why flowers?" some might ask.

Although they are mostly known as blood-feeders, mosquitoes also drink nectar from flowers. In fact, male mosquitoes do not feed on blood at all, so their only food sources are nectar and other forms of sugar from plants.

The scientists chose the butterfly bush (*Buddleja davidii*) for their experiment because it's a very hardy plant that flowers throughout the year, and mosquitoes are attracted to it.

"From my visual observations, when I brought the truck filled with these flowering plants to the field sites and parked, I could see the mosquitoes fly to the plants," said Dr. Timothy Davis, one of the authors.

The researchers used "blood sausages" — sheep or pig intestines that are filled with cattle blood — to feed female mosquitoes that had been released in large cages containing the flowers and water containers.

They found significantly more eggs in the largest containers, and they found more eggs in containers next to flowering butterfly bushes than in containers without flowers.

These findings could lead to new methods of controlling the mosquito.

"One of the potential outcomes of this study might be that someone could look at the flower fragrances as a way to lure egg-laying female mosquitoes to some sort of trap," said Dr. Phil Kaufman, one of the researchers.

"This study provides evidence of the attractiveness of flowering butterfly bushes to ovipositing (i.e., egg-laying) *Aedes albopictus,"* said Dr. Davis. "Ovipositing mosquitoes are those that have taken a bloodmeal and, in instances where pathogen transmission is occurring, are the potential vectors as they may have acquired the pathogen through the bloodmeal. Therefore, exploiting the attractiveness of flowering butterfly bushes in developing control techniques could assist in stopping pathogen transmission."

The researchers suggest that female mosquitoes lay eggs near flowers for a variety of possible reasons. Nectar is an important energy source, so pregnant females are obviously attracted to the flowers in order to feed themselves. But it could also have something to do with providing food for the next generation in the form of nectar.

"Putting eggs in water near a nectar source may be a way of provisioning for the offspring,

which do need sugar upon emergence," said Dr. Kaufman.

While these findings might tempt people to remove flowers to keep mosquitoes away, the researchers doubt it would help much.

"The mosquitoes we studied were blood-fed already and were looking for a place to lay eggs," said Kaufman. "We found that flowers by your house may attract mosquitoes that have already blood fed, so they would not be interested in biting. We did not evaluate host-seeking mosquitoes, so I cannot comment on whether the flowers would attract mosquitoes that are seeking a blood meal. I suspect that they are just as likely to come in, but we have no data on that. Sounds like a project for the next student…"

However, the findings of this study may be used one day to increase the effectiveness of mosquito trapping and monitoring efforts, especially if the attractants from the butterfly bush can be isolated and replicated.

"Incorporation of phytochemicals that are produced by butterfly bush may enhance ovitrap effectiveness, thereby improving surveillance and control efforts," according to the authors.