NEW ZEALAND BIOSECURE

BORDER HEALTH NEWSLETTER - APRIL 2018

WELCOME!

Kia Ora Koutou,

it was great to see many of you at the Health Protection Forum in Wellington. It was interesting learning more about all the activities that PHOs are involved in. I noticed that you were all really busy this summer and not only with mosquitoes. Fortunately, mosquito numbers have decreased in comparison to last month, and with the weather getting cooler it seems this tendency will continue over the upcoming winter.

Another two *Culex quinquefasciatus* larvae have been found in Queenstown this month, in the same sample site as last month. We will keep you updated in this regard. In the news, new experiments have found that this species is able to salivate Zika virus after being infected in the laboratory.

April 25th was the World Malaria Day, an international observance that recognizes global efforts to control malaria. Scroll down to learn more about the current Malaria situation in the world.

Did you get your egg mozzie hunting answers correct? Find out at the end of this newsletter.

SURVEILLANCE

During April 1146 samples were collected by staff from the 12 DHBs with 261 positive samples. This included 78 adult samples and 183 larval samples, leading to a total of 924 adults and 5868 larvae identified over the past month (Table 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during April of last year and this year.

	Adults		Larvae	
***Species* (common name)**	**Apr. 18**	**Apr. 17**	**Apr. 18**	**Apr. 17**
Aedes notoscriptus (striped mosquito)	89	181	2073	1524
Ae. antipodeus (winter mosquito)	2	14	0	0
Coquillettidia iracunda	0	4	0	0
Culex pervigilans (vigilant mosquito)	172	32	426	586
Cx. quinquefasciatus (southern house mosquito)	661	236	3271	4388
Cx. asteliae	0	0	0	10
Opifex fuscus (rockpool mosquito)	0	0	98	68
Total	**924**	**467**	**5868**	**6576**

Compared to this same month last year, total adult numbers have shown a significant increase (98%), while in contrast, total larvae numbers have shown a moderate decrease (11%, Table 1).

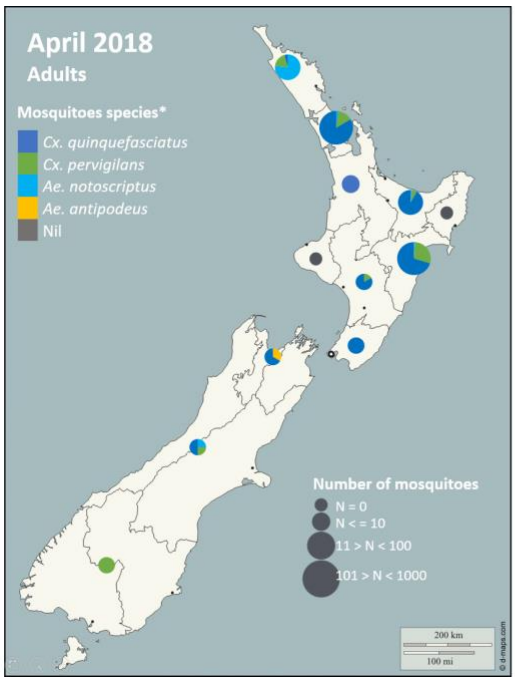
Compared to March, both adult and larvae number have shown a significant decrease (60% and 71% respectively).

In total 5 mosquito species have been collected this month, one less than last month. Four was the maximum number of mosquito species detected this month in Hawkes Bay DHB, Hutt Valley Health and Nelson Marlborough DHB, followed by Auckland DHB, Community and Public Health, MidCentral DHB, Northland DHB, Toi Te Ora – PH and Waikato DHB with 3 mosquito species, 2 mosquito species were found in Public Health South and Taranaki Health and 0 in Tairawhiti DHB (Figure 1).

Northland is the DHB with the highest number of larvae this month (1467, that is 59% less than last month) followed by MidCentral (1234, 76% less than last month) and Community and Public Health and Toi Te Ora - PH (both 695, 76% and 75% less than last month respectively).

Following the same pattern as last month, Auckland DHB had the highest adult numbers this month (487, 70% less than last month) followed by Hawkes Bay DHB (276, 5% less than last month Figure 1).

a)



b)

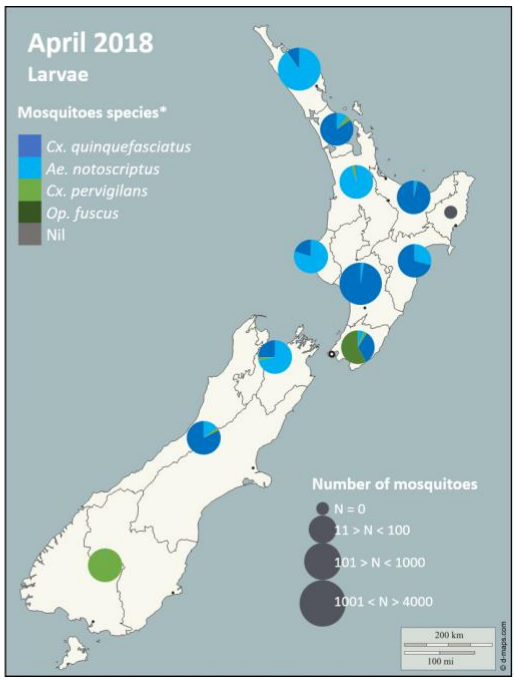


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the April 2018 surveillance period.
* The mosquito species are listed in order from the most abundant to the least abundant.
Please note that the markers represent the DHBs and not the specific sites where the samples have been taken.

Two of the introduced species, *Aedes notosciptus* and *Culex quinquefasciatus* have been found this month (Table 1, Figure 1), nil *Aedes australis* have been recorded this month in

comparison to last month.

As expected *Aedes notoscriptus* have not been recorded this month, this year and last year in Public Health South. Two *Culex quinquefasciatus* larvae have been recorded in Queenstown, this month in the same sample site that last month (Figure 2).

Larvae numbers for the introduced mosquito *Aedes notoscriptus* have shown a 36% increase this month compared to the same month last year, while *Culex quinquefasciatus* larvae have shown a 25% decrease this month compared to the same month last year (Table 1).

Aedes notoscriptus larval numbers have shown an increase in 6 DHBs from this same month last year (Auckland, Community and Public Health, Taranaki Health, Waikato, Nelson Marlborough, MidCentral and Northland), and shown a decrease in Hutt Valley Health and Toi Te Ora (Figure 2). In comparison with this same month last year, *Ae. notoscriptus* has been now detected in the Hawkes Bay (Figure 2).

Culex quinquefasciatus larval numbers have shown an increase in 5 DHBs from this same month last year (Auckland, Community and Public Health, Nelson Marlborough, Hawkes Bay and Toi Te Ora), and shown a decrease in 4 DHBs (Hutt Valley, Waikato, Northland and MidCentral, Figure 2). Two *Cx. quinquefasciatus* larvae have been detected in Queenstown, Public Health South. No *Cx. quinquefasciatus* larvae have been detected in Taranaki Health this month this year in contrast with this same month last year. Zero *Cx. quinquefasciatus* have been registered in Tairawhiti this month or this same month last year (Figure 2).

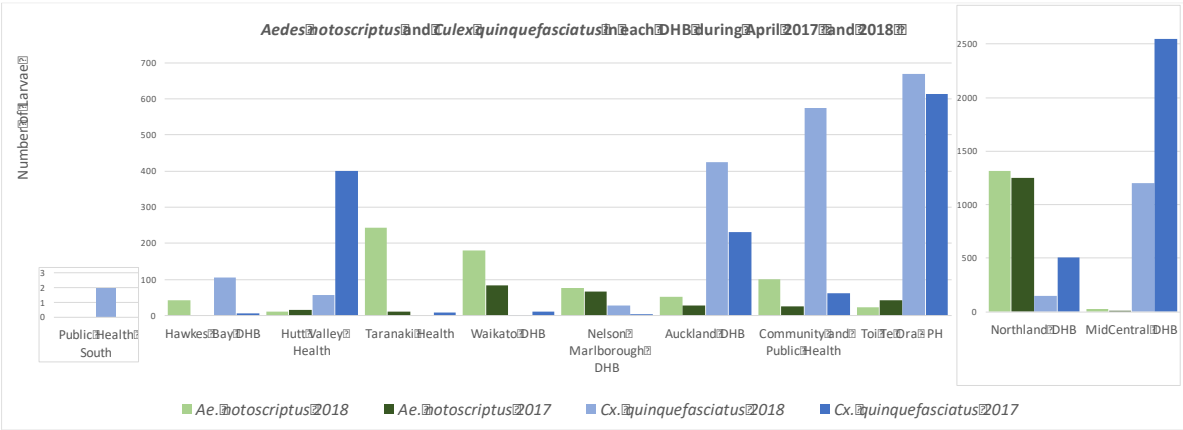


Figure 2. Comparison between introduced mosquitoes sampled in each DHB New Zealand during April 2017 and 2018.

* Please note the different scale for the number of larvae present in MidCentral, Northland and Public Health South in comparison to the other DHBs.

Disclaimer: Note that all comparisons made have not been statistically tested and can be due to sampling effort.

INCURSIONS AND INTERCEPTIONS

During April, 7 suspected interceptions have been recorded (Table 2). The exotic species are highlighted in pale blue.

Table 2. Suspected interceptions during April 2018

Date	Species	Location	Circumstances
10.04.18	1 Male *Culex quinquefasciatus*	Sanitarium Pah Road Auckland	Found dead in packaging
10.04.18	2 Male *Aedes vexans*	Simple Freight Services, Auckland	Found dead attached to packaging from Fiji
10.04.18	1 Male *Culex quinquefasciatus*	17 Maurice Wilson Ave, Auckland	Found dead in imported car from Australia
16.04.18	1 Female *Culex quinquefasciatus* 1 Male *Culex quinquefasciatus*	CFR Line Limited, Auckland	Found dead in imported car from Australia
16.04.18	1 Female *Culex pervigilans*	Vision Logistics, Auckland	Found alive outside of packaged goods from India
27.04.18	1 Female *Culex pervigilans*	Coin Cascade TF, Hillsborough Christchurch	Found dead at entry of container by MPI
28.04.18	1 Male *Culex quinquefasciatus*	Hellmann Worldwide Logistics, Auckland	Found alive at MPI inspection room while looking at consignment from Australia

NEWS ARTICLES FROM AROUND THE WORLD

Another mosquito species may carry Zika

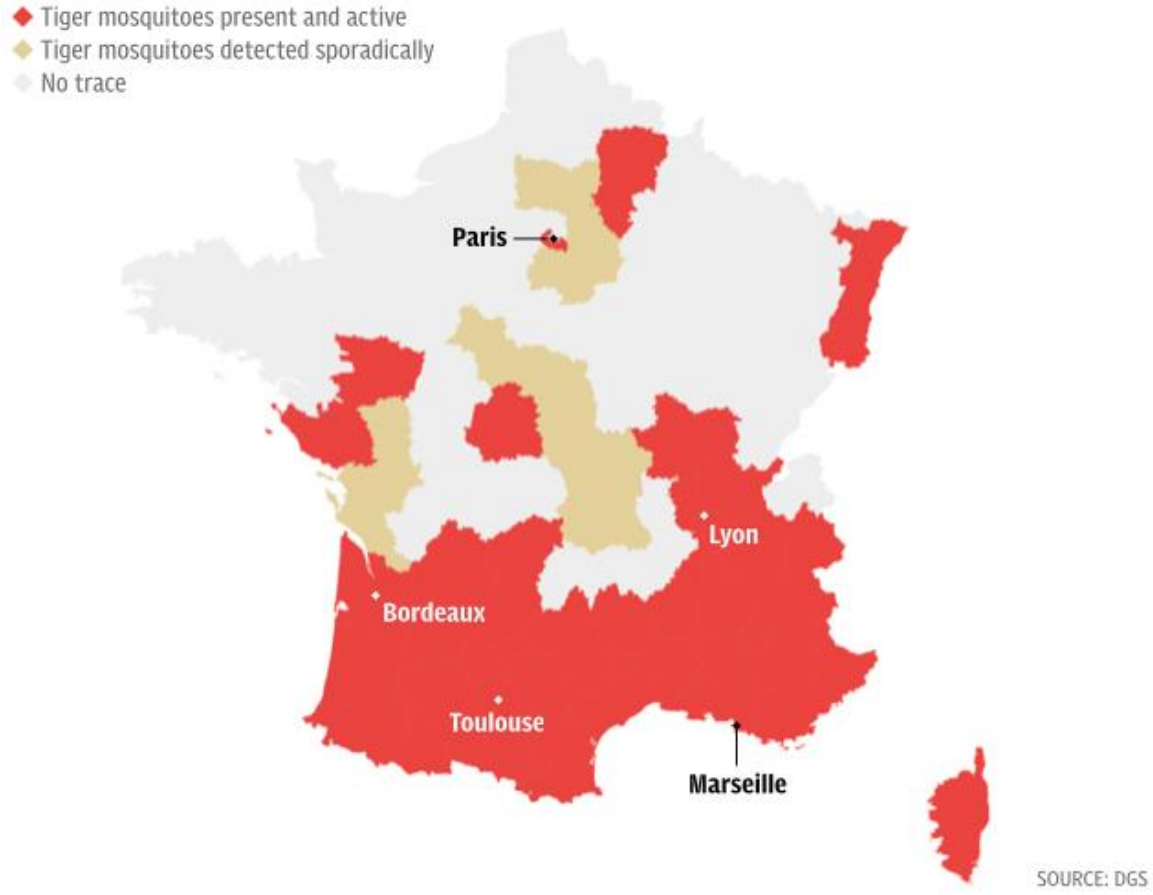
Female *Culex quinquefasciatus*

Another mosquito may carry the zika virus, but more research is needed to confirm the early lab tests, University of Florida scientists say. UF Institute of Food and Agricultural Sciences researchers detected zika in the saliva of southern house mosquitoes collected in Florida. Chelsea Smartt, an associate professor at the UF/IFAS Florida Medical Entomology Lab in Vero Beach, Florida, said her study's finding supports that the mosquito species, known scientifically as *Culex quinquefasciatus*, can contain live Zika virus in saliva. To date the mosquito species *Aedes aegypti* is considered the primary carrier of Zika virus. Still, Smartt stresses researchers must perform more experiments to know whether and how much of a role *Culex quinquefasciatus* plays in spreading zika. Read more. Original research article.

Climate change spurs proliferation of disease-bearing insects, increases exposure to viral infections

Scientists at the Joint Research Centre, the European Commission's science and knowledge service, find that global warming has allowed disease-bearing insects to proliferate, increasing exposure to viral infections. Spurred on by climate change, international travel and international trade, disease-bearing insects are spreading to ever-wider parts of the world. This means that more humans are exposed to viral infections such as Dengue fever, Chikungunya, Zika, West Nile fever, Yellow fever and Tick-borne encephalitis. Read more.

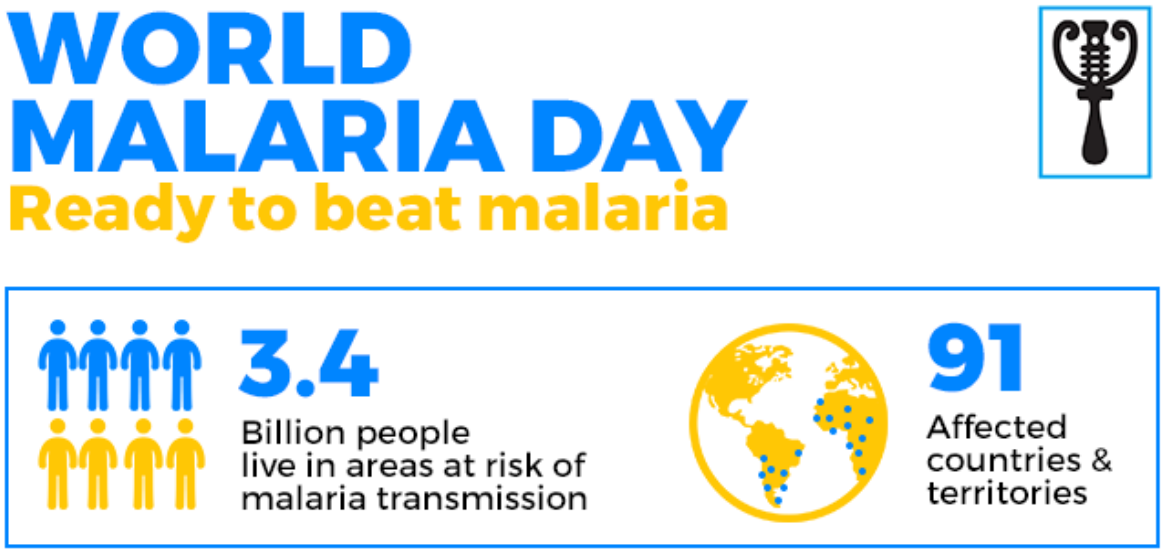
Tiger mosquitoes capable of carrying Zika spread across half of France



Tiger mosquitos spreading in France

Aggressive tiger mosquitoes that can carry diseases such as Zika, dengue and Chikungunya fever have spread throughout half of France as health authorities urge holidaymakers to use repellents. The invasive insect, which originated in Asia and can be recognised from its distinctive black-and-white striped body and legs, is now prevalent throughout the south and centre of the country, in the southern Paris suburbs and in pockets in the north. Read more.

World Malaria Day 2018: Ready to beat Malaria



Malaria remains one of the oldest diseases in the world. According to statistics from the World Health Organisation, 3.4 billion people live in areas at risk of malaria transmission in 91 countries and territories. Malaria is a disease that is transmitted through the bites of infected female *Anopheles* mosquitoes. The disease is caused by *Plasmodium* parasites. Two of the parasite species that cause malaria in humans pose the greatest threat. The species are *Plasmodium falciparum* and *Plasmodium vivax.* Read more.

Study: Dehydration prompts increased blood feeding by mosquitoes

When it's hot and dry, mosquitoes like nothing more than the refreshing taste of you. Biologists with the University of Cincinnati discovered that female mosquitoes bite not only to get the protein they need to lay eggs but also to quench their thirst during a drought. Now researchers are trying to find out just how often mosquitoes must bite to stay hydrated, which could help doctors fight illnesses such as malaria. Read more.

Study provides global view of how yellow fever virus can spread between the world's cities

The deadly yellow fever virus has the potential to spread into cities around the world where it previously hasn't been seen, according to a new study led by St. Michael's Hospital. Researchers led by Dr. Kamran Khan of St. Michael's have mapped the worldwide pathways through which yellow fever virus could spread by analyzing global patterns of airline travellers, the environmental conditions needed to enable transmission of the virus within a city, and countries' requirements for travellers to provide proof of yellow fever vaccination upon entry. Read more.

THE BEST INTERCEPTION MOZZIE PICTURE OF THE MONTH

Female *Culex pervigilans* found alive at Vision logistics outside packaged goods from India, Auckland.

About the photographer: Aaron Guanlao is a Health Protection Officer / Technical Officer working in the Environmental Health Team at Auckland Regional Public Health Service.

Characteristics of a good Mozzie picture:
- Picture is in focus
- The light allows the viewer to interpret the different colours.
- All body parts are distinguishable.

RISK MAPS

Dengue Map – Centres for Disease Control and Prevention

Zika Map – Centres for Disease Control and Prevention

Malaria – Centres for Disease Control and Prevention. Choose a country to display the current distribution of Malaria.

DISEASE OUTBREAKS

To find out where the latest disease outbreaks have occurred visit:

Epidemic and emerging disease alerts in the Pacific region - Produced by the Pacific Community (SPC) for the Pacific Public Health Surveillance Network (PPHSN).

World Health Organization – World Health Organization.

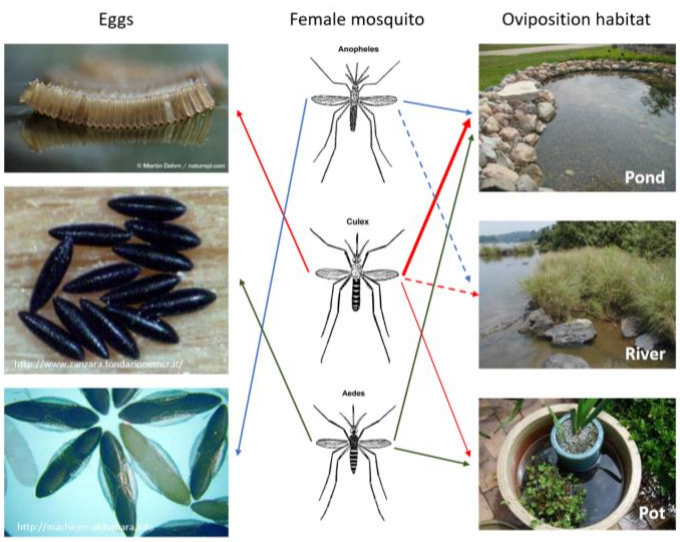
Public Health Surveillance - Institute of Environmental Science and Research (ESR) - Information for New Zealand Public Health Action.

THE EASTER EGG MOZZIE HUNTING

There are three female mosquitos from three different genera: *Anopheles*, *Culex* and *Aedes*. Join the female mosquito with its eggs and their favourites oviposition habitats (it could be more than one oviposition habitat).

The answer to the oviposition habitat is not that straightforward and is species specific. Species in the same genera have a range of different preferred habitats to lay eggs.

Here are some examples.



Aedes females will lay their eggs on different surfaces, humid or dry ones, in natural or artificial containers that are able to hold water. The eggs will hatch after the container is full of water. Some species can lay they eggs on the water surface. *Ae. antipodeus* breeds in freshwater ground pools. *Ae. camptorhychus* eggs are usually laid on a damp substrate, but are also laid on the water surface. *Ae notoscriptus* laid at the water level around the edges of containers. *Ae. aegypti* breeds in artificial containers including water drums, roof guttering, rain water tanks, pot plant saucers, tanks, tins, vases, tyres, subterranean waters and refuse filled by rain. This species will also breed in natural containers such tree holes and leaf axils of bromeliads.

Anopheles bancroftii breed in freshwater swamps, water holes and stream margins, *A. amictus* breeds in natural or human made ground pools, *A. annulipes* in ground and rock pools with clear and permanent water and *A. farauti* prefers swamps, lagoons and ponds. *A. gambiae* is restricted to the extensive alluvial areas along rivers.

Culex females lay their eggs on water surfaces in rafts. *Cx. annulirsotsis* breeds in fresh water swamps, lagoons and pools. *Cx. sitiens* prefers brackish saltmarsh pools. *Cx. gelidus* larvae are commonly found in freshwater ground pools, rivers, marshes, open drains and containers, and also in artificial containers. *Cx. quinquefasciatus* breeds in fresh to brackish water in artificial and natural containers.