



## BORDER HEALTH NEWSLETTER – NOVEMBER 2022

### NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

2022 is the second year in a row in which New Zealand has experienced the warmest November on record, and with temperatures going up, mosquito numbers are increasing as well. Scroll down to witness what mosquitoes are up to so far this summer.



In the news this month, read about the fight against Japanese encephalitis in Western NSW, with NSW Health distributing free vaccines as stagnant pools of water create ideal breeding grounds for mosquitoes throughout the region. Also, learn about the increasing concerns around the invasive mosquito *Anopheles stephensi*, with its ability to resist some standard insecticides and survive all year round. Also, have a look at the new dengue vaccine that is ready to be rolled out, though safety concerns linger. Finally, learn about a novel treatment -almost ready for clinical trials- to prevent people from manifesting the most severe forms of dengue disease.

In the first-ever “know your vector-borne disease” section, learn about Japanese encephalitis....

Happy reading!



## AIAL awarded the GIA Industry MPI Biosecurity Award 2022 - Some words from Sally Giles

Kia ora koutou

I am delighted to share with you all that Auckland International Airport Limited have recently been awarded the GIA Industry MPI Biosecurity Award 2022 for their creation of a Culture of Biosecurity Champions. A very well deserved award and recognition of the leadership and mahi of Kristina Cooper (Head of Operations Risk and Assurance) and Shaun Sie (Regulatory Assurance Manager).

The Judge's Description from the evening was :

*Auckland Airport has elevated biosecurity from being something that border control staff do in the passenger arrivals area, to something the whole airport community understands and is involved with.*

*In doing so, the company has created a culture and a team of biosecurity champions – growing awareness and engagement among its own workers as well as the staff of airlines, ground handlers, tenants and border agencies at the Airport.*

*Through awareness raising, training, documentation, standard setting and creation of a biosecurity community; biosecurity is now a foundational value for the company. This prioritisation is visible in all aspects of their business.*

*To date, over 10,000 workers within the wider airport community have completed Auckland Airport's online biosecurity training.*

*Because Auckland Airport is New Zealand's largest international airport, receiving passengers and goods from around the globe, it is a first line of defence at New Zealand's air border. By supporting a strong border, the company is helping keep Aotearoa free from exotic pests and diseases.*

It is also opportune to promote the Biosecurity Business Pledge. Auckland Airport has been a member of the Biosecurity Business pledge since its inception in 2019 and encourages all other airports and seaports that are Places of First Entry to become members of the Pledge. The Pledge provides an open learning environment led by business for business where participants share initiatives which they have undertaken to improve the biosecurity systems and culture in their organisation, as well as MPI also sharing initiatives, forthcoming changes and challenges with industry and having free and open conversations. The Pledge has also recently developed a set of Biosecurity Governance Guidelines for CEOs and Boards to assess their biosecurity risk management. To find out more about the Biosecurity Business Pledge and the Biosecurity Governance Guidelines see [Biosecurity Business Pledge - businesses protecting NZ from pests and diseases](#) | [Ko Tātou This is Us](#)



We wish you all a safe and  
happy time over the  
Christmas and New Year  
break

★ The NZB lab is closed for routine activities during Statutory Holidays and open on days between and following.  
As always, the on-call response is available throughout the period including Public Holidays.

As always, *Aedes aegypti*, *Ae albopictus* and friends are not welcome in New Zealand

## SURVEILLANCE

During November, 1452 routine samples were collected by staff from 12 PHUs (Figure 1). The samples included 163 positive larval samples and 50 positive adult samples, leading to a total of 2163 adults and 5928 larvae identified over the past month (Table 1). *Aedes notoscriptus* are the dominant larval species this month, which is the same as this month last year (Table 1). We have also seen a large increase in *Aedes antipodeus* adults compared to the same month last year (Table 1).

In total, eight mosquito species have been collected this month (Table 1), three more than collected last month.

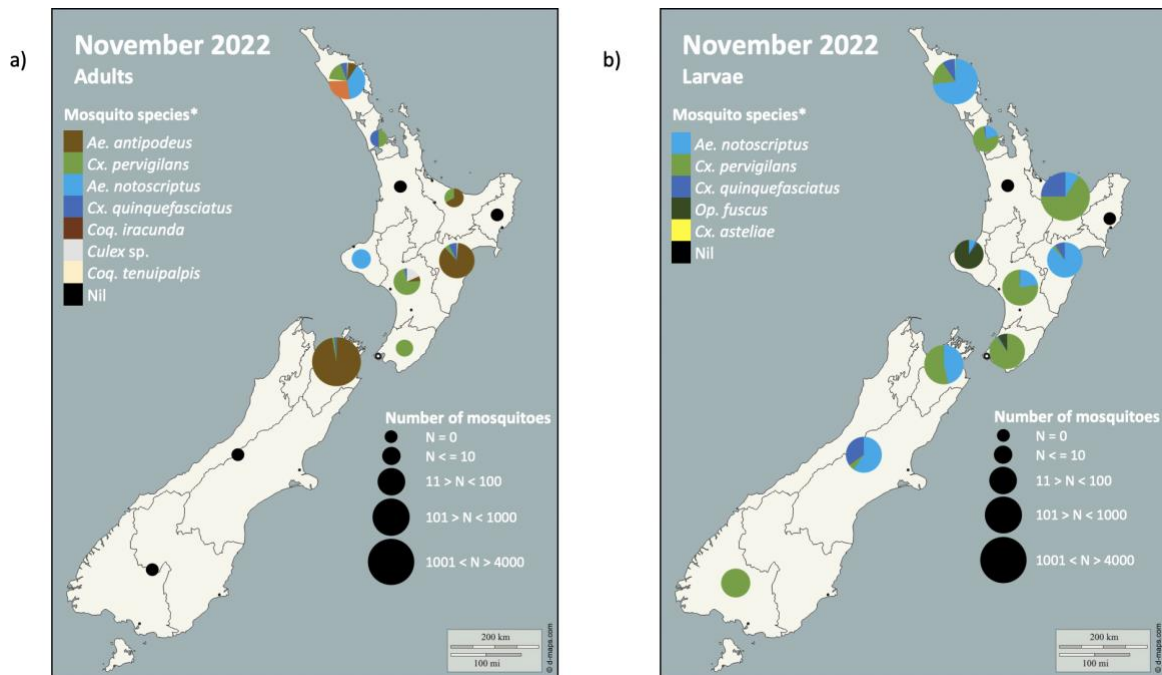
Table 1. Adult and larvae sampled by the New Zealand surveillance program during November 2021 & 2022

Species (common name)	Adults		Larvae	
	Nov 22	Nov 21	Nov 22	Nov 21
<i>Ae antipodeus</i> (winter mosquito)	1770	20	-	-
<i>Ae asteliae</i>	-	-	10	-
<i>Ae notoscriptus</i> (striped mosquito)	96	404	2706	1872
<i>Coq iracunda</i> (no common name)	65	15	-	-
<i>Coq tenuipalpis</i> (no common name)	5	-	-	-
<i>Cx pervigilans</i> (vigilant mosquito)	136	744	2345	1563
<i>Cx quinquefasciatus</i> (southern house mosquito)	71	297	801	417
<i>Culex</i> sp.	20	8	1	-
<i>Opifex fuscus</i> (rock pool mosquito)	-	-	65	18
<b>Total</b>	<b>2163</b>	<b>1488</b>	<b>5928</b>	<b>3870</b>

Compared to this same month last year, the total number of larvae and adults have shown an increase (53% and 45% respectively) (Table 1).

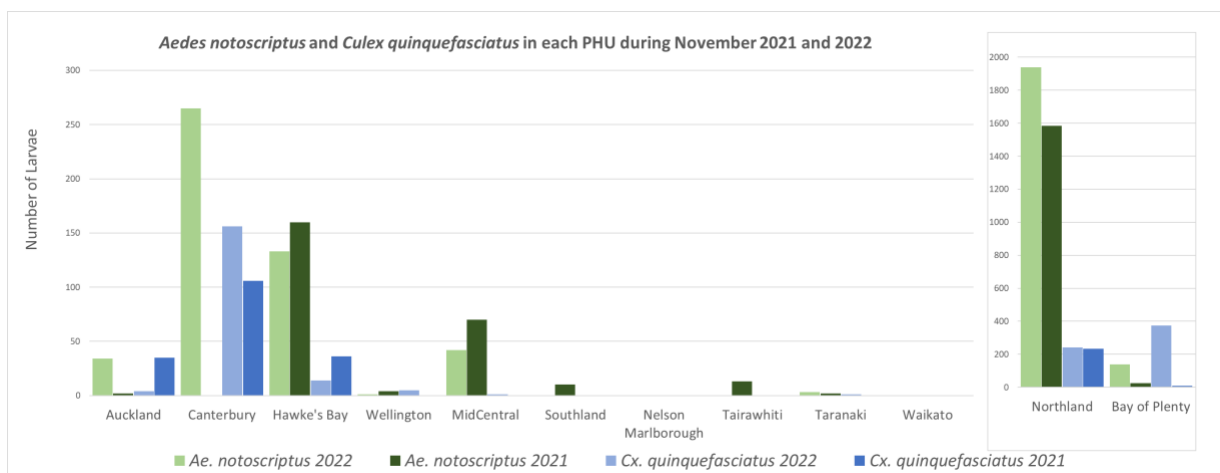
Compared to the previous month, both mosquito larval and adult numbers have shown an increase (445% and 1,260% respectively).

The highest number of larvae sampled this month was obtained in Northland (2649 larvae) followed by Bay of Plenty (1501 larvae) (Figure 1).



**Figure 1.** Total mosquito adults (a) and larvae (b) sampled in New Zealand during the November 2022 surveillance period. Please note that the markers represent the PHUs and not the specific sites where the samples have been taken.

\* The mosquito species are listed in order from the most abundant to the least abundant.



**Figure 2.** Comparison between introduced mosquito species sampled in each PHU during November 2021 and 2022.

\*Please note the different scale for the number of larvae present in Northland and Bay of Plenty in comparison to the other PHUs.

*Aedes notoscriptus* larval numbers have shown an increase in 6 PHUs and a decrease in four PHUs from this same month last year (Figure 2). As expected, *Aedes notoscriptus* has not been recorded this month, this year, or last year in Public Health South (Figure 2).

*Culex quinquefasciatus* larval numbers have shown an increase in seven PHUs and a decrease in two from this same month last year. *Culex quinquefasciatus* has not been found this month in Public Health South (Figure 2).

## INCURSIONS AND INTERCEPTIONS

During November, HPOs responded to three suspected interceptions. Locally occurring species of exotic origin is highlighted green (Table 2).

Table 2. Suspected interceptions during November 2022

Date	Species	Location	Circumstances
09.11.2022	2 x 4 <sup>th</sup> instar larvae <i>Culex quinquefasciatus</i> 2 mosquito pupae	QuayPack - Port Nelson – Transitional Facility	Larvae found in a tyre holding water in the back of a vehicle imported from Australia. Vehicle was unloaded from a vessel (MV Trans Future 7) at a transitional facility at Port Nelson on the 8th of November, with the tyre being discovered when it was unloaded, but reported on the 9th of November. The vessel had first arrived in NZ on the 30th of Oct and stopped for various lengths of time at PoA, Lyttleton Port, and Wellington Port before stopping in Nelson. No adults were noted to be present.
09.11.2022	1 non-mosquito Adult	Tauranga Port	Found dead during a ship sanitation for vessel Rio de la Plata.
18.11.2022	1 Female <i>Culex pervigilans</i>	International NZ Post mail centre Auckland airport	Found alive on workers desk in airport mailroom. The desk was at the opposite end of the building to the inbound mail.

## NEWS ARTICLES FROM AROUND THE WORLD

### Free vaccines handed out in western NSW as mosquito-borne illness threat looms



NSW Health is distributing free vaccines in Western NSW for Japanese encephalitis, as stagnant pools of water create ideal breeding grounds for mosquitoes throughout the



region. Western NSW Local Health District's Priscilla Stanley says health officials are particularly keen to get vaccines to those who spend long hours outside or who are regularly exposed to stagnant water following the floods. She says they are seeing large quantities of mosquitoes, as well as anecdotal reports of "incredibly large" and particularly "nasty" specimens. [Read more here.](#)

## Kill the dengue virus in 6 hours instead of 2 weeks? This NUS researcher is 'getting close'



Imagine a day when patients with dengue can step into a polyclinic, have their dengue strain diagnosed and head home to rest after an injection of antibodies, knowing the virus will be killed within six hours. Professor Paul MacAry and his team from the Immunology Translational Research Programme, at the National University of Singapore's Yong Loo Lin School of Medicine (NUS Medicine), are set on preventing people from manifesting the most severe forms of the dengue disease. In 2012, they isolated a human antibody, after screening "literally hundreds of millions" of antibodies, derived from individuals who had recovered from dengue serotype 1. Today, the scientists have not only isolated antibodies to all four dengue serotypes, but also made kilogrammes of these substances, and are gearing up for clinical trials of the four "super potent" medicines. According to MacAry, the medicines his team are developing would be the most potent therapy for dengue that currently exists. [Read more here.](#)

## Dengue vaccine poised for roll-out but safety concerns linger

A vaccine to prevent infection from dengue — a mosquito-borne disease that kills 20,000 people a year — is poised to roll out in Indonesia next year. But some researchers say that important safety concerns have been overlooked. The vaccine, called Qdenga and developed by the pharmaceutical company Takeda, headquartered in Tokyo, is particularly significant because it is the first for people who have not been exposed to dengue. The only other approved vaccine, Dengvaxia, can be given only to people who have already been infected, as it increases the risk of severe disease in individuals with no history of infection. With no treatments and limited ways to control the spread of mosquitoes, vaccines are desperately needed. [Read the article here.](#)



## Mosquito blood meals reveal history of human infections



An innovative approach analysing mosquitoes’ last blood meals can reveal evidence of infection in the people or animals that the flying insects feast on. Scientists say that the method, presented at an infectious-disease conference in Malaysia last week, could be used to study people’s and animals’ past exposure to a range of pathogens, while avoiding the ethical and practical issues of testing them directly. It could also aid early detection in animals of diseases such as Ebola and SARS-CoV-2, says Niels Verhulst, who studies pathogens transmitted by insects, at the University of Zurich, Switzerland. And it could help scientists to identify the animal host of a new virus. [Access article here.](#)

## Invasive mosquito could disrupt Africa’s ‘landscape of malaria’ after cases rise

How is *Anopheles stephensi* different from Africa's main native malaria mosquito?

	<i>Anopheles gambiae</i>	<i>Anopheles stephensi</i>
<b>Habitat:</b>	Rural	Urban
<b>Lays eggs in:</b>	Natural water bodies: lakes, ponds, puddles.	Human water containers and natural water bodies.
<b>Peak biting:</b>	Late night <i>Prevent by sleeping under bed net.</i>	Evening <i>Before bedtime. Bed nets not effective.</i>
<b>Rests after biting:</b>	On surfaces indoors <i>Killed by indoor residual insecticide spray.</i>	Outdoors <i>Avoids indoor residual insecticide spray.</i>

Scientists are warning that the invasion of an insecticide-resistant mosquito could change Africa’s “landscape of malaria” after research showed it caused an unprecedented urban outbreak in Ethiopia. Most of Africa’s 228m annual cases of malaria are still caused by the *Anopheles gambiae* mosquito, whose population ebbs and flows seasonally, thriving in the rainy months, particularly in rural areas, but receding as a threat in the dry season. But since

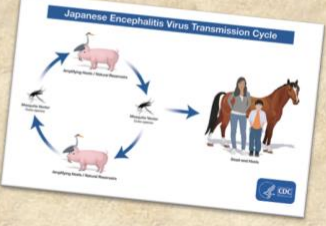




it arrived in Africa, *Anopheles stephensi* has alarmed health officials with its ability to resist some standard insecticides and survive all year round. Fitsum G Tadesse, from the Armauer Hansen Research Institute in Addis Ababa, says this mosquito increased Malaria infections 10-fold in an urban area, over just three weeks, during a dry season. [Access article here](#). [Read more here](#).

## KNOW YOUR VECTOR-BORNE DISEASE

# Japanese encephalitis

- Japanese encephalitis is a mosquito borne disease caused by a flavivirus. The disease was first documented in Japan in 1871 with the virus being isolated in 1935.
  - It is the most important cause of viral encephalitis in Asia.
- It is transmitted through the bites of infected *Culex* mosquito species.
  - In Asia the common mosquito to transmit the virus is *Culex tritaeniorhynchus*, while in Australia the primary mosquito responsible for the current outbreak is *Culex annulirostris*.
- Animals can be infected with the virus, with the cycle being maintained in nature between mosquitoes and pigs and wading birds, which act as amplifying hosts or reservoirs.
  - The virus is only transmitted to humans through the bite of infected mosquitoes and can't be passed on through eating meat from an infected animals or contact with infected animals.
  - Humans are dead-end hosts and the virus does not reach concentrations high enough to infect mosquitoes if an infected person is bitten.
- Symptoms in severe cases include a high fever, headache, disorientation, a stiff neck, spastic paralysis, seizures, and coma. 30% of severe infections will result in death, and of those who survive, 20-30% will suffer permanent damage to the brain.
  - Children often have vomiting and gastrointestinal pain as the initial symptoms.
  - Most infections are mild and are either asymptomatic or a mild fever and headache.
- There is no cure for Japanese encephalitis, however vaccines are available.
  - Protecting yourself from mosquito bites while visiting high risk areas is also a good way to prevent infection.



## 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

[Malaria](#) – World Health Organisation

## 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).

[Disease Outbreak News](#) - World Health Organization.

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

[Communicable disease threats report](#) - European Centre for Disease Prevention and Control