



BORDER HEALTH NEWSLETTER

September 2024

NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

Spring has settled in and with the warmer weather starting to sneak back, mosquito numbers also begin to rise. We would like to remind everyone to please make sure that samples are entered into the database promptly, so we are able to add the results. Not getting positive samples yet? We still need the negatives entered! This is especially important at the end of a month so we're able to provide the data analysis below.

In the news this month, read about the amazing victory against lymphatic filariasis in Brazil thanks to a decade long elimination program, and how mozzie spit could be of great help in the development of a vaccine against arboviral diseases. Climate change is continuing to create opportunities for mosquitoes to establish in new areas and spread diseases, learn why scientists are worried about this phenomenon in Europe. See why experts are suggesting there is a need to improve the pandemic response strategy worldwide, and finally, take a look at the recent surge of Eastern Equine Encephalitis in the USA.

This month in our 'bite of information' section, we have prepared two diagrams to shed some light on everyone's favourite mozzie complex; the *Culex pipiens* complex. See below and familiarise yourself with the ecology and behaviour of two members of the complex, namely *Cx pipiens* f. *pipiens* and *Cx pipiens* f. *molestus*. Finally, check the bite of humour section to (hopefully) have a good laugh and raise your endorphins levels!

Happy reading!

SURVEILLANCE

During September a total of 1261 routine surveillance, enhanced surveillance and various survey samples were collected by staff from 12 PHUs (Figure 1). The samples included 64 positive larval samples and 16 positive adult samples, leading to a total of 1893 larvae and 17 adults identified over the past month (Table 1).

Aedes notoscriptus is the dominant larval species this month, which is the same as September last year and last month (Table 1).

Compared to the same month last year, the total numbers of larvae and adults have shown a decrease (38 and 33 respectively%).

Compared to the previous month, the total numbers of larvae and adults have shown an increase (75 and 27 respectively%).



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Table 1. Adult and larvae sampled by the New Zealand surveillance program during September 2023 & 2024

Species (common name)	Adults		Larvae	
	Sep 24	Sep 23	Sep 24	Sep 23
<i>Aedes antipodeus</i> (winter mosquito)	2	6	-	-
<i>Ae australis</i> (saltwater mosquito)	-	-	-	12
<i>Ae notoscriptus</i> (striped mosquito)	2	-	1494	2732
<i>Culex asteliae</i> (no common name)	-	-	8	-
<i>Cx pervigilans</i> (vigilant mosquito)	6	4	338	314
<i>Cx quinquefasciatus</i> (southern house mosquito)	4	11	2	3
<i>Culex</i> sp.	2	-	-	-
<i>Opifex fuscus</i> (rock pool mosquito)	1	-	51	8
Total	17	21	1893	3069

The highest number of larvae sampled this month was obtained in Northland (1319 larvae) followed by Canterbury (318 larvae) (Figure 1).

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

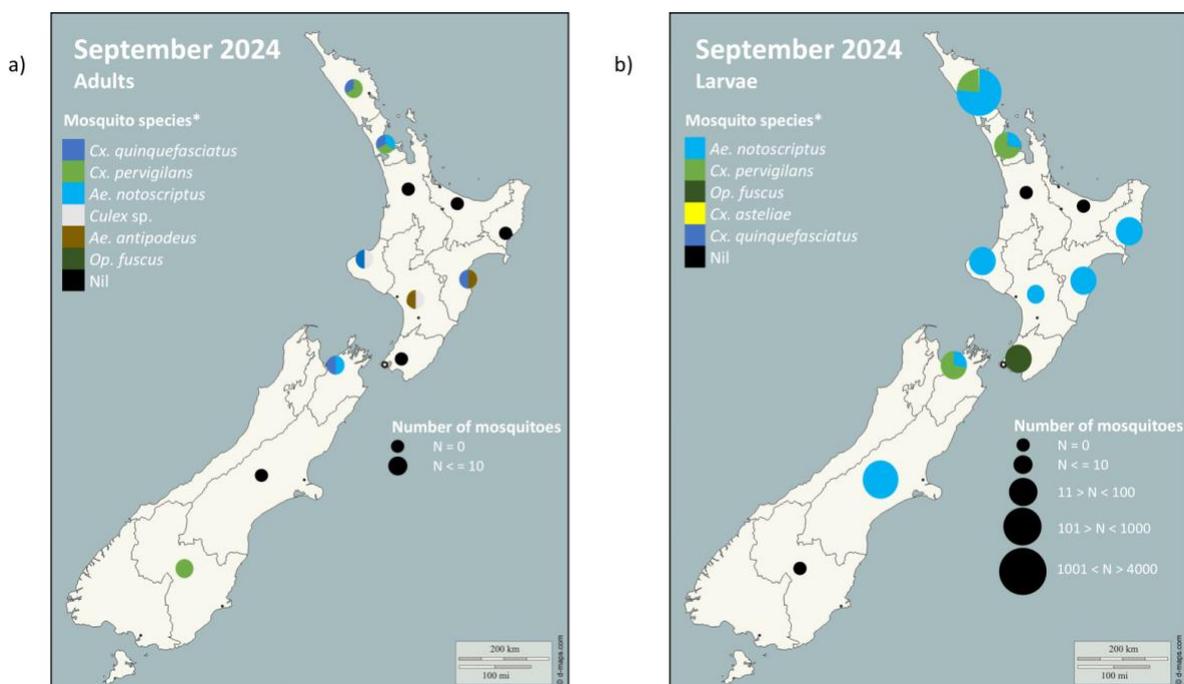


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during September 2024 surveillance period. Please note that the markers represent the PHUs and not the specific sites where the samples have been taken.

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

Aedes notoscriptus larval numbers have shown an increase in two PHUs and a decrease in six 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 Southland (Figures 1 and 2).



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Culex quinquefasciatus larval numbers have remain low with nil collected in ten PHU's, a decrease shown in one PHU and the same number collected in Northland from this same month last year (Figure 2).

As expected, *Culex quinquefasciatus* larvae have not been recorded this year in Southland (Figures 1 and 2).

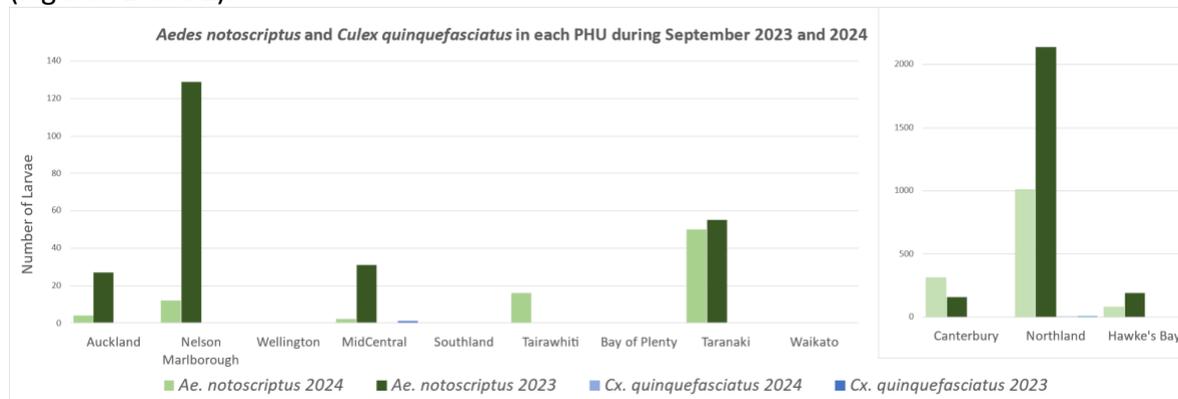


Figure 2. Comparison between introduced mosquito species sampled in each PHS during September 2023 and 2024.

*Please note the different scale for the number of larvae present in Northland, Hawke's Bay & Canterbury in comparison to the other PHSs.

INCURSIONS AND INTERCEPTIONS

During September, HPOs responded to one suspected interception (Table 2).

Northern Region – No mosquitoes were collected from air cans this month as part of the ongoing response at Auckland International Airport.

Nelson Marlborough HPOs continue their response following the *Culex pipiens f. molestus* found in a routine sample at Nelson Port in May. Further specimens were collected from enhanced surveillance traps early in the month.

Table 2. Suspected interception during September 2024

Date	Species	Location	Circumstances
06.09.2024	1 Female <i>Culex pervigilans</i>	Bunnings Distribution Centre, 7 Te Kapua Drive, Mangere, Auckland	Mosquito was found alive in a container of palletised, boxed indoor and outdoor furniture from Indonesia via Singapore and Malaysia



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NEWS ARTICLES FROM AROUND THE WORLD

Brazil achieves milestone in eliminating lymphatic filariasis



Lymphatic filariasis, also known as elephantiasis, has been a huge problem for many years, affecting at least an estimated 51million lives. Brazil has taken great strides in eliminating this notorious disease, being validated by the WHO for having eliminated lymphatic filariasis as a public health problem. [Read more here.](#)

The elimination plan has been in progress for a few decades, involving large scale operations such as the mass distribution of antiparasitic drugs, vector control activities, and strong surveillance, particularly in the most affected areas. With these efforts, the country achieved the end of disease transmission in 2017. [Read more about emerging opportunities for treatment and control.](#)

How mosquito spit could help develop therapies for arboviral diseases



When a mosquito is infected with a virus, the proteins in the mosquito are altered. This phenomenon can be observed in the saliva of said infected mosquitoes. Through a process called “shotgun proteomics” the proteins of the saliva of a non-infected mosquito, acting as the control group, and the proteins of the saliva of mosquitoes in various stages of the infection can be compared. The aim is to use the findings of their work to develop a vaccine for viruses that can harm or kill people, animals and plants such as West Nile, yellow fever, dengue fever, Japanese encephalitis. [Read more here.](#)



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Mosquito-borne diseases are surging in Europe — how worried are scientists?



Climate change is increasingly transforming Europe into a breeding ground for mosquito-borne diseases, with researchers warning of rising threats from viruses like West Nile virus (WNV). A report from the European Centre for Disease Prevention and Control (ECDC) revealed 715 locally acquired WNV cases across 15 countries this year, surpassing last year's figures and resulting in 51 deaths as of early September. The prolonged, hotter summers and increased rainfall due to climate change have extended the transmission periods and allowed mosquitoes to spread to new areas lacking previous immunity. This has been noticed in the *Culex pipiens* mosquito, which transmits WNV from infected birds to humans, and the Asian tiger mosquito, *Aedes albopictus*, responsible for transmitting dengue and chikungunya. Factors such as increased travel, especially post-COVID-19, further facilitate the spread of these viruses. Experts emphasize the importance of personal precautions to avoid bites, including using repellents and eliminating standing water where mosquitoes breed. Additionally, the risk of asymptomatic individuals contaminating blood supplies raises concerns about public health. The situation underscores the need for ongoing surveillance and preparedness for emerging vector-borne diseases in regions where they were previously uncommon. [See full article.](#)

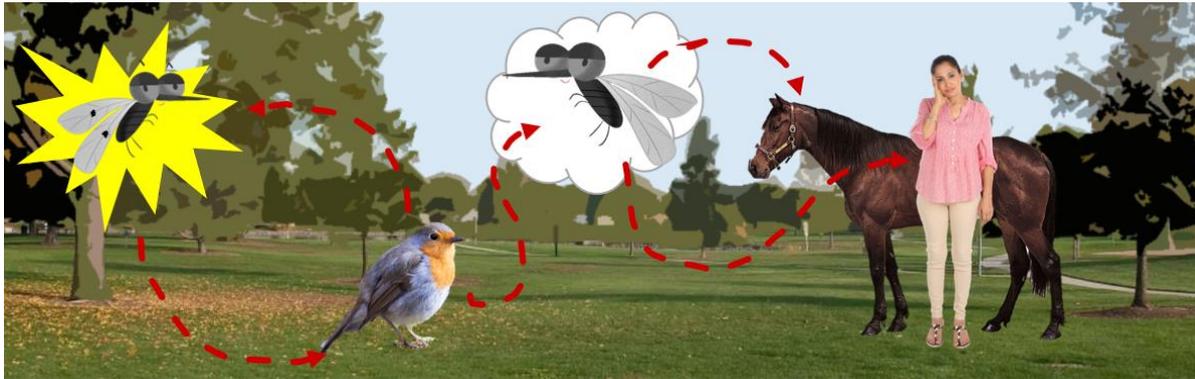
Survey reveals significant gaps in global pandemic preparedness

A recent survey by the Abbott Pandemic Defence Coalition, involving over 100 global experts in infectious diseases, reveals that while pandemic preparedness has improved since COVID-19, significant gaps remain. Key areas needing attention include building surveillance programs, enhancing public health funding, and developing testing infrastructure. Experts are divided on whether new or known pathogens pose greater outbreak threats, but most agree that viral pathogens are the most concerning. The survey highlights the growing risk of mosquito-borne diseases due to climate change, predicting that millions could be affected by diseases like Zika and dengue in coming decades. Respondents emphasize the importance of robust tracking of changing ecosystems and public health funding. The Coalition advocates for three main priorities: enhancing surveillance and funding, understanding outbreak risk profiles, and adapting to environmental changes to improve response strategies. Collaboration among public and private sectors is crucial for effective pandemic preparedness. [Read the full article here.](#)



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Eastern Equine Encephalitis (EEE) outbreak update



Eastern Equine Encephalitis is a rare but deadly disease. There is a 30% mortality rate of those who develop severe symptoms. Recent reports of a man in New York who has succumbed to eastern equine encephalitis, make him the second victim of this deadly disease this year. In the past month the disease has infected an additional 7 people and has spread from New England states; Wisconsin, Massachusetts, New Jersey, New Hampshire and Vermont, to New York and Rhode Island. If you or anyone you know are living in these areas, it is highly recommended to wear insect repellent and loose clothing that covers as much skin as possible. [Access 2024 Data here](#). [Read more here](#) or [here](#).



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A BITE OF INFORMATION

Culex pipiens f. pipiens

The diagram shows a mosquito biting a pigeon in a residential area. A dashed line traces the mosquito's path to a heart-shaped mating site and then to a house. A yellow starburst highlights the mosquito's activity.

- Heterodynamic- Not active during winter (winter diapause)
- Ornithophilic- Bites birds
- More likely to be arbovirus vector
- Eurygamous- Cannot mate in confined spaces.
- Anautogenous- Requires blood meal to lay eggs.
- Epigeous- Lays eggs aboveground.

*DIAGRAMS NOT TO SCALE

Culex pipiens f. molestus

The diagram shows a mosquito biting a person on a city street. A dashed line traces the mosquito's path to a confined space (like a trash bin) for mating and then to a house for egg-laying. A yellow starburst highlights the mosquito's activity.

- Mammophilic- Bites mammals
- Homodynamic- Active year-round (no winter diapause)
- Stenogamous- Mates in confined spaces
- Autogenous- Does not require blood meal for first batch of eggs.
- Hypogeous- Lays eggs underground

*DIAGRAMS NOT TO SCALE



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A BITE OF HUMOUR



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