New Zealand BioSecure

BORDER HEALTH NEWSLETTER

APRIL 2025

NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

Do you know how to say mosquito in New Zealand Sign Language (NZSL)? We must confess that we did not, so since this is the NZSL Week (held from May 5th to May 11th, 2025) we thought we could learn how to say it together. So here you have it! Don't forget to practice!

In the news this month, read about the study of the seasonal cycle of the West Nile virus and about the impact of small molecular changes in the western equine encephalitis virus. Discover how Africa is taking its future into its own hands and invest in its own genomic research to develop local expertise and tailor its fight against malaria. Finally, read about how climate change will pose a threat on the blood supply chain and how Yellow Fever is becoming a threat for the Asia-Pacific region.

In February 2025 newsletter, we provided a refresher on data entry into the online database. Last month, we had a pop quiz to see if you had been taking notes. Well, guess what? The quiz is back this month to give you a chance to have a go if you missed out! Challenge yourself and colleagues to see who will get the highest score! The link to the guidelines for using the database is provided in case you are unsure about how to use the database. Good luck!

Have a look at the best picture of the month to get some inspiration for your next photo. Thank you, Bruce Waddleton (National Public Health Service/Te Waipounamu), for sending it.

Happy reading!

SURVEILLANCE

During April 1286 samples were collected by staff from 12 NPHUs (Figure 1). The samples included 190 positive larval samples and 123 positive adult samples, leading to a total of 9132 larvae and 430 adults identified over the past month (Table 1).

Culex quinquefasciatus is the dominant larval species this month, which is the same as this month last year and last month (Table 1)

In total, seven mosquito species have been collected this month (Table 1), that is the same number as collected last month.

Compared to this same month last year, the total number of larvae have increased (66%) and the total number of adults have shown a decrease (20%) (Table 1).

Compared to the previous month, mosquito larval and adult numbers have shown a decrease (36% and 60% respectively).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during April 2024 & 2025

Species (common name)	Adults		Larvae	
	April 25	April 24	April 25	April 24
Aedes antipodeus (winter mosquito)	1	-	-	-
Ae australis (saltwater mosquito)	2	-	-	-
Ae notoscriptus (striped mosquito)	18	4	3072	1351
Culex asteliae (no common name)	-	-	66	-
Cx pervigilans (vigilant mosquito)	8	5	644	236
Cx quinquefasciatus (southern house mosquito)	362	507	5057	3878
Culex sp.	39	22	100	-
Opifex fuscus (rock pool mosquito)	-	-	193	25
Total	**430**	**538**	**9132**	**5490**

The highest number of larvae sampled this month was obtained in Northland (4726 larvae) followed by Bay of Plenty (1572 larvae) (Figure 1).

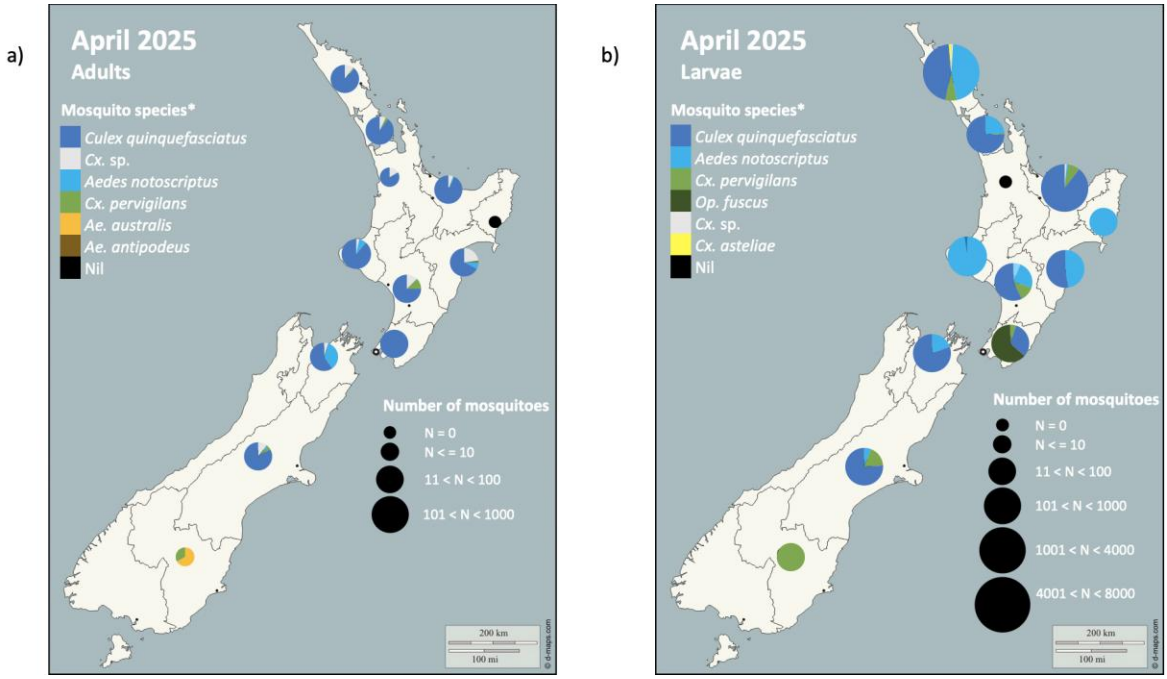


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during April 2025 surveillance period. Please note that the markers represent the NPHUs and not the specific sites where the samples have been taken.
* The mosquito species are listed in order from the most abundant to the least abundant.

Aedes notoscriptus larval numbers have shown an increase in seven NPHUs and a decrease in three NPHUs and remained the same in two NPHUs compared to the same month last year (Figure 2).

Aedes notoscriptus was not recorded in Southland in April of this year or last year (Figure 2).

Culex quinquefasciatus larval numbers have shown an increase in six NPHUs, a decrease in four NPHUs, and remained the same in two NPHUs compared to the same month last year (Figure 2).

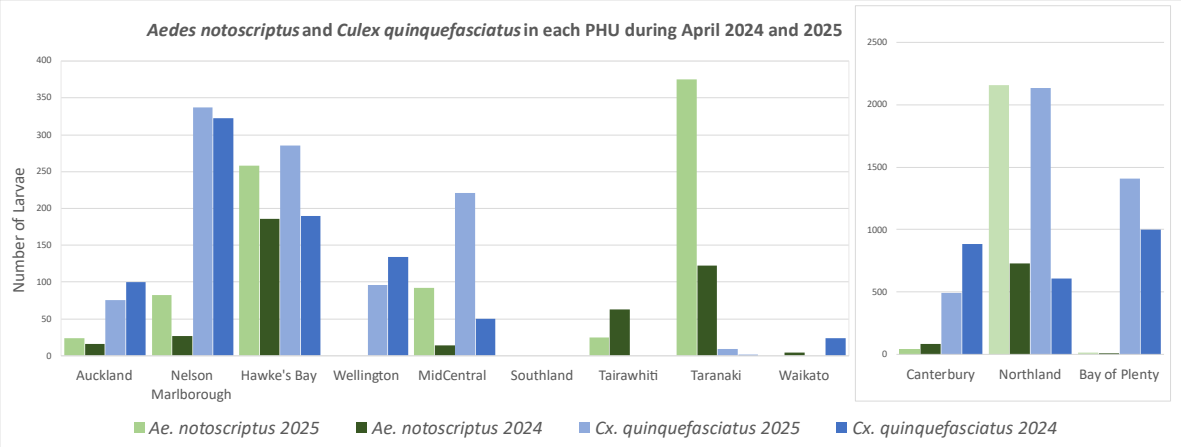


Figure 2. Comparison between introduced mosquito species sampled in each NPHU during April 2024 and 2025. *Please note the different scale for the number of larvae present in Canterbury, Northland and Bay of Plenty in comparison to the other NPHUs.

INCURSIONS AND INTERCEPTIONS

During April, HPOs responded to two suspected interceptions, a locally occurring species and a non-mosquito (Table 2).

Table 2. Suspected interception during April 2025

Date	Species	Location	Circumstances
17.04.2025	1 Female *Culex pervigilans*	Transitional Facility, Silverdale, Auckland	Found alive in a container of vacuum bags and food packaging from Guangdong, China. No other insects seen alive or dead.
22.04.2025	1 non-mosquito (cranefly)	Transitional Facility, Islington, Christchurch	Found alive in a container of water supply products from Queensland, Australia. No other insects seen alive or dead.

NEWS ARTICLES FROM AROUND THE WORLD

Unravelling the seasonal cycle of West Nile virus: A data-driven approach to mosquito control

A federally funded led by Ohio State University researchers aims to better understand the seasonal transmission of West Nile virus (WNV) in the U.S. by using mathematical models to analyse factors such as temperature, light pollution. The study focuses on how WNV persists

through winter and re-emerges each spring, especially in urban versus rural areas, where artificial light and heat may delay (or even prevent) mosquito dormancy. For three years, researchers will tag, and release captured birds after collecting blood samples that will show their infection status. During winter, the team will sample diapausing mosquito to check what animals they have been biting and if they are already infected with WNV. Researchers hope to then determine how the virus cycles through hosts and environments, ultimately informing public health strategies to time mosquito control efforts more effectively. Read more here.

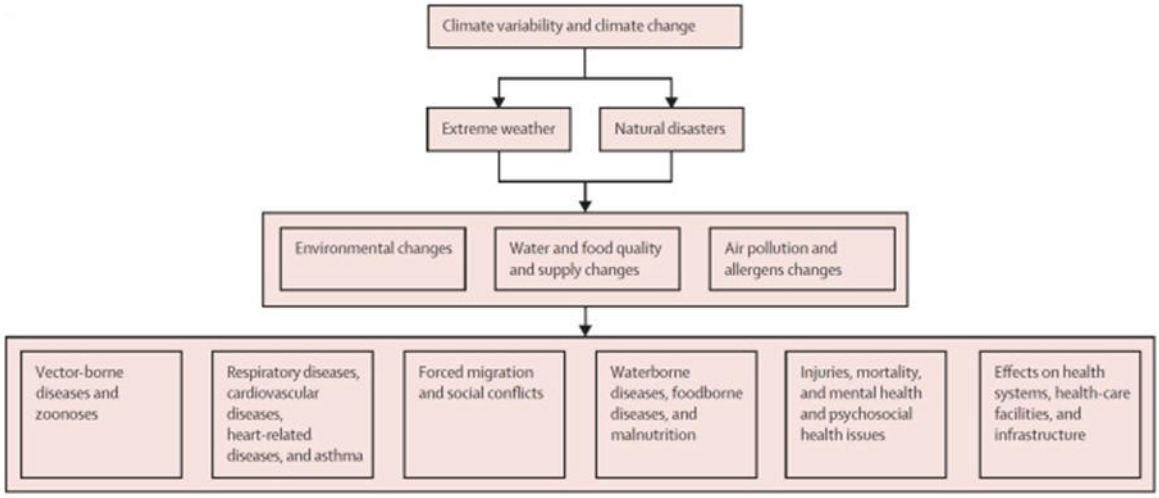
Small molecular shifts can drastically alter encephalitis virus behaviour

A new study led by Harvard Medical School reveals how small molecular changes in the spike proteins of the western equine encephalitis virus (WEEV) can drastically alter its ability to infect humans and cause outbreaks. By examining viral strains from the past century, researchers found that a single mutation could either block or enable the virus's attachment to human and mammalian cell receptors, explaining why WEEV faded in North America but re-emerged in South America in 2023. These findings, shed light on how minor viral changes can trigger major public health events and underscore the importance of vigilant surveillance and preparedness against emerging infectious diseases. Read more here or discover the full scientific paper here.

Tailoring the fight against malaria: How genomic research is shaping Africa's health future

Despite decades of efforts to combat malaria through mosquito control, drugs, and vaccines, the disease remains a major public health challenge in Africa, largely due to the genetic diversity and adaptability of the malaria parasite *Plasmodium falciparum*. New research led by African scientists, including the Pathogens genomic Diversity Network Africa (PDNA), has revealed that parasite strains differ significantly across regions, undermining one-size-fits-all strategies and prompting the World Health Organization to adopt more localized, data-driven interventions. Genetic tools are now essential for tracking drug resistance and assessing vaccine effectiveness, and the genomic research infrastructure developed for malaria has also proven valuable during other health crises like COVID-19. However, sustaining this progress requires greater investment in local research capacity and scientific training, as the demand for genetic research expertise far exceeds current training capacity and infrastructures. Read more here.

Climate change poses growing threat to global blood supply chains



A new study reveals that climate change poses a significant threat to the global blood supply by disrupting every stage of the supply chain—from donor availability to transportation and storage. Researchers from the University of the Sunshine Coast and Australian Red Cross Lifeblood warn that rising temperatures, extreme weather events, and the spread of infectious diseases may both reduce donor numbers and increase demand for blood. Challenges include donor health risks, reduced mobility during disasters, shortened shelf life of blood, and emerging diseases such as dengue and malaria. Additionally, migration caused by sea-level rise may require more ethnically diverse donors. The study urges governments and health services to adopt flexible, climate-resilient systems, including innovations like drones, mobile blood banks, and real-time disease surveillance, to safeguard blood supplies in an increasingly unstable climate. Read more here or discover the full scientific paper here.

Yellow fever's looming threat: Globalization and climate amplify pandemic risk

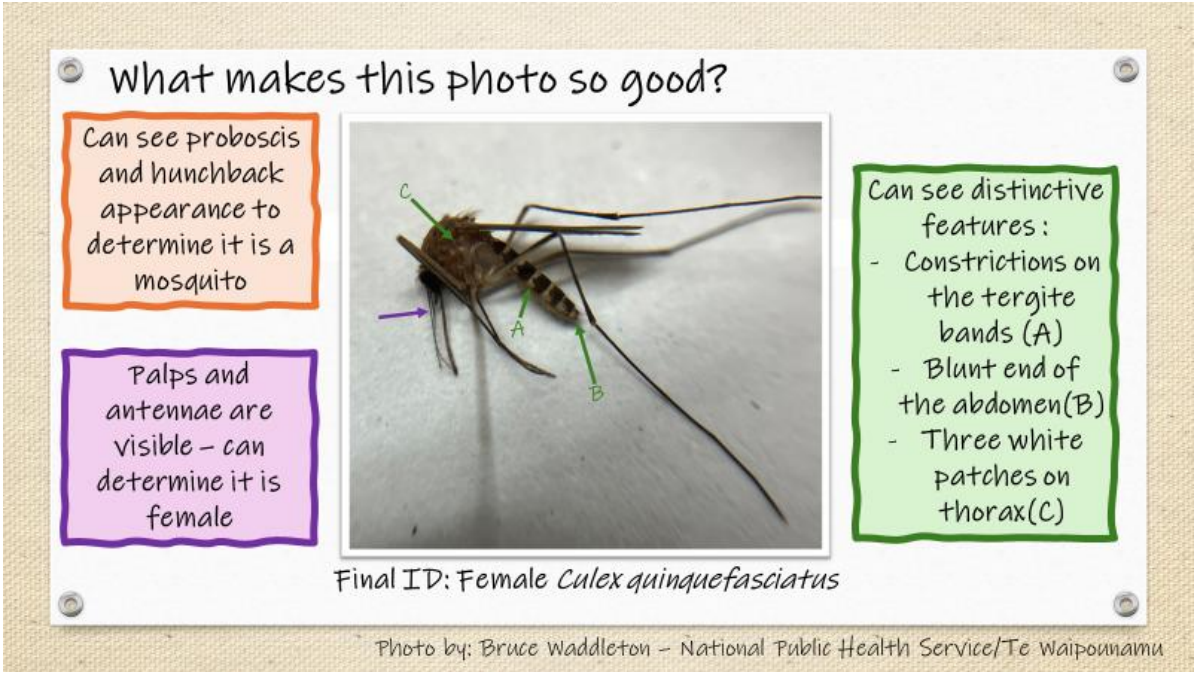
A recent study in *npj Viruses* warns that global trends like urbanization, international travel, and mosquito habitat expansion are heightening the risk of yellow fever (YF) spreading beyond its traditional zones and invade the Asia-Pacific region. Despite the availability of a highly effective vaccine and historical efforts to eradicate the disease, YF continues to be a threat. The study highlights the unique risk posed by the yellow fever virus (YFV), which can be efficiently transmitted between humans via *Aedes aegypti* mosquitoes, raising concerns of potential outbreaks in densely populated, non-immune regions where *Ae aegypti* is

already widespread. Despite favourable conditions for YF transmission in Asia-Pacific and tropical America, no major urban epidemics have occurred, a phenomenon the study describes as an ongoing "enigma." Possible explanations include cross-protective immunity from related viruses like dengue and Zika, geographic and demographic barriers, effective mosquito control, and sheer luck. The authors stress that, given yellow fever's high fatality rate and potential for rapid spread, a modern-day outbreak could surpass the devastation of COVID-19. Urgent action is needed to boost surveillance, vaccine production, vector control, and global preparedness to prevent a potential yellow fever pandemic. Read more here or discover the full scientific paper here.

A BITE OF INFORMATION

Thank you for all those who did the quiz! We thought we would run it again this month before commenting on the results. Now, take out your notes and click on the picture below to start. If you need a refresher, read through the Guideline here or read February 2025 Newsletter's Bite of Information.

BEST MOZZIE PHOTO OF THE MONTH



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.

Communicable disease threats report - European Centre for Disease Prevention and Control