



BORDER HEALTH NEWSLETTER

JANUARY 2023

NAU MAI, HAERE MAI - WELCOME!

Kia ora koutou katoa,

We hope you are all safe and dry after the heavy rain affecting the North of the North Island.

The mozzie numbers are already showing the weather effects with more than a 100% increase compared to the previous month. Fear not! Scroll down to find some tips to help you protect yourself from mosquito bites and have fun with the Bite of Humour section.

In the news this month, learn about the increase in dengue cases in Malaysia and Bangladesh, with experts raising the alarm that a dengue fever epidemic is set to hit these countries starting this year. Read about a new class of sulphonamides that prevent mosquitoes from transmitting malaria by killing the parasite in a specific sexual phase of its life cycle. Also, learn about new vaccines against malaria that use part of the protozoan *Plasmodium falciparum* as the antigenic agent to induce an immune memory of the parasite. Finally, read about predictive models used to determine the effect of poverty and climatic variables on the rate of serotype distribution and severe dengue in Mexico.

Happy reading!

SURVEILLANCE

During January 1,495 routine samples were collected by staff from 12 PHUs (Figure 1). The samples included 288 positive larval samples and 125 positive adult samples, leading to a total of 1,788 adults and 13,941 larvae identified over the past month (Table 1). *Culex quinquefasciatus* are the dominant larval species this month, the same as this month last year and in contrast with last month which was *Aedes notoscriptus* (Table 1).

Table 1. Adult and larvae sampled by the New Zealand surveillance program during January 2022 & 2023

Species (common name)	Adults		Larvae	
	Jan 23	Jan 22	Jan 23	Jan 22
<i>Aedes antipodeus</i> (winter mosquito)	14	11	-	-
<i>Ae asteliae</i> (no common name)	1	1	28	-
<i>Ae australis</i> (saltwater mosquito)	2	-	-	-
<i>Ae notoscriptus</i> (striped mosquito)	803	326	4500	3733
<i>Coquilleltidia iracunda</i> (no common name)	11	5	-	-
<i>Coq tenuipalpis</i> (no common name)	1	-	-	-
<i>Culex pervigilans</i> (vigilant mosquito)	130	431	2487	3704
<i>Cx quinquefasciatus</i> (southern house mosquito)	759	1300	6769	14544
<i>Culex</i> sp.	60	60	-	1
<i>Culiseta tonnoiri</i> (no common name)	7	-	-	-
<i>Opifex fuscus</i> (rock pool mosquito)	-	-	157	225
Total	1788	2134	13941	22207



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

Compared to this same month last year, the total number of larvae and adults have shown a decrease (37% and 16% respectively) (Table 1).

Compared to the previous month, both mosquito larval and adult numbers have shown an increase (141% and 125% respectively).

The highest number of larvae sampled this month was obtained in Northland (4,082 larvae) followed by Bay of Plenty (3,207 larvae) (Figure 1).

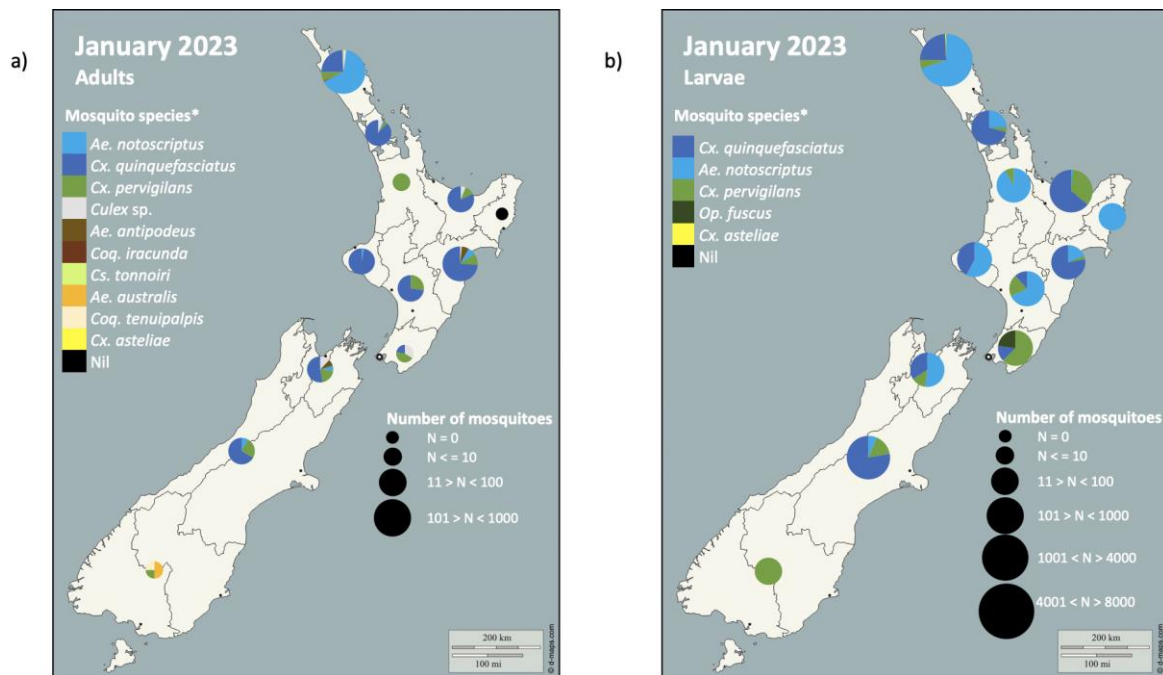


Figure 1. Total mosquito adults (a) and larvae (b) sampled in New Zealand during the January 2023 surveillance period. Please note that the markers represent the PHUs and not the specific sites where the samples have been taken.

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

Aedes notoscriptus larval numbers have shown an increase in seven PHUs and a decrease in four PHUs from this same month last year (Figure 2).

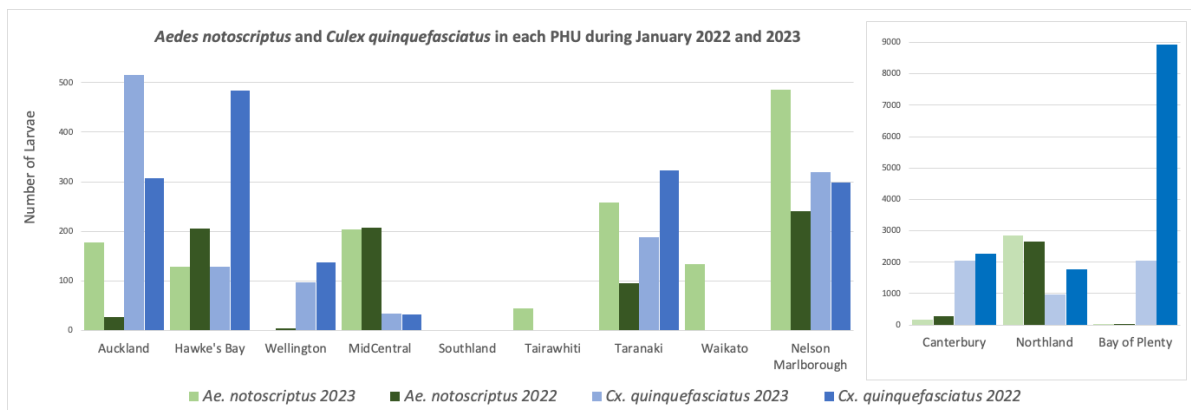


Figure 2. Comparison between introduced mosquito species sampled in each PHU during January 2022 and 2023.

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



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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 two PHUs and a decrease in six from this same month last year. *Culex quinquefasciatus* has not been found this month in Public Health South (Figure 2).

INCURSIONS AND INTERCEPTIONS

During January, HPOs responded to one suspected interception. Unwanted species are shown in red (Table 2).

Table 2. Suspected interception during January 2023

Date	Species	Location	Circumstances
19.01.2023	2x 4 th instar <i>Aedes aegypti</i> larvae	Auckland International Airport	Collected from Tyre 14B during routine surveillance in the ITB. Enhanced surveillance is currently in place.
	16x 3 rd instar <i>Aedes aegypti</i> larvae		

NEWS ARTICLES FROM AROUND THE WORLD

Will 2023 be the year of dengue?



Experts have raised the alarm that a dengue fever epidemic is set to hit Malaysia starting this year. They are urging authorities to strengthen interventions and the public to take preventative steps, with cases expected to peak in 2024 and 2025. “The recent increase in dengue cases is expected,” said public health expert and epidemiologist Professor Datuk Dr Lokman Hakim Sulaiman. “Based on observations over the past three decades (in Malaysia), severe dengue outbreaks occur every four to five years.” Dengue is caused by four distinct, but closely related, serotypes, all of which can be found in Malaysia. Infection with one serotype provides immunity to that serotype for life, but not to other serotypes, contributing to the “cyclical transmission” trend. Over the past five decades, dengue cases have increased by 30-fold globally, with half of the world’s population now at risk. [Read the full story here.](#)

Rutgers researcher maps dengue fever hotspots in Mexico

As many as one in five dengue fever deaths in the Americas occur in Mexico, and the rate of the disease’s severity has been increasing for decades, according to the World Health Organization. Now, a Rutgers researcher has generated data that could help curb the



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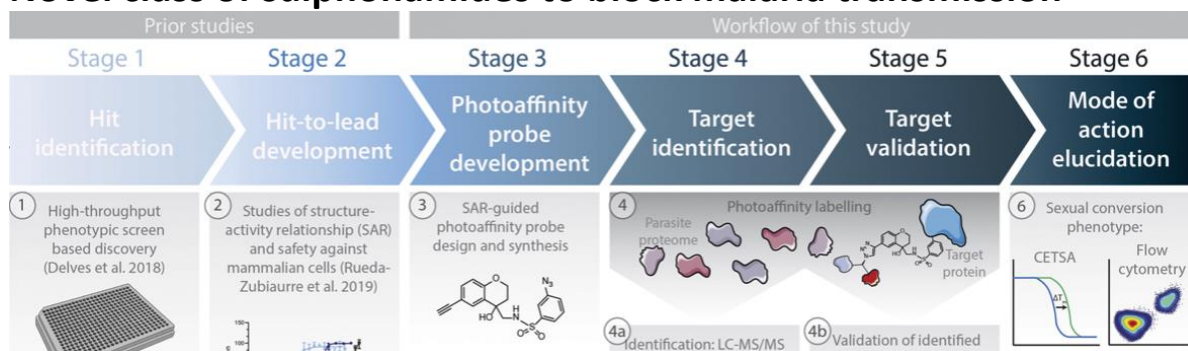
mosquito-borne illness in the country. Ubydul Haque, an assistant professor of global health at the Rutgers Global Health Institute, has analyzed data from Mexico's Ministry of Health to identify dengue fever hotspots. Working with epidemiologists at the University of North Texas and Universidad Autónoma de Nuevo León, the team calculated environmental and socioeconomic risk factors and mapped areas where severe outbreaks occur. [Read more here. Access the full article.](#)

Don't let dengue ravage us again



With at least 281 deaths and 62,382 hospitalisations from Dengue, 2022 saw the highest annual death toll and the second-highest cases ever recorded in Bangladesh. In December alone, at least 27 people died and 5,024 were hospitalised. Dengue is a preventable disease, and its trajectory is, and has been, predictable. In Bangladesh, dengue cases usually start to surge around June-July every year, and we have decades of experience in dealing with such surges now. According to experts, the changing nature of urbanisation is one of the biggest reasons for the high number of dengue cases in Bangladesh. The presence of stagnant water in the open, and in the basements of under-construction buildings, provides the perfect breeding ground for *Aedes* mosquitoes. It is time for the authorities to take appropriate measures, including addressing harmful social and institutional practices before the dengue season starts. [Read the full story.](#)

Novel class of sulphonamides to block malaria transmission



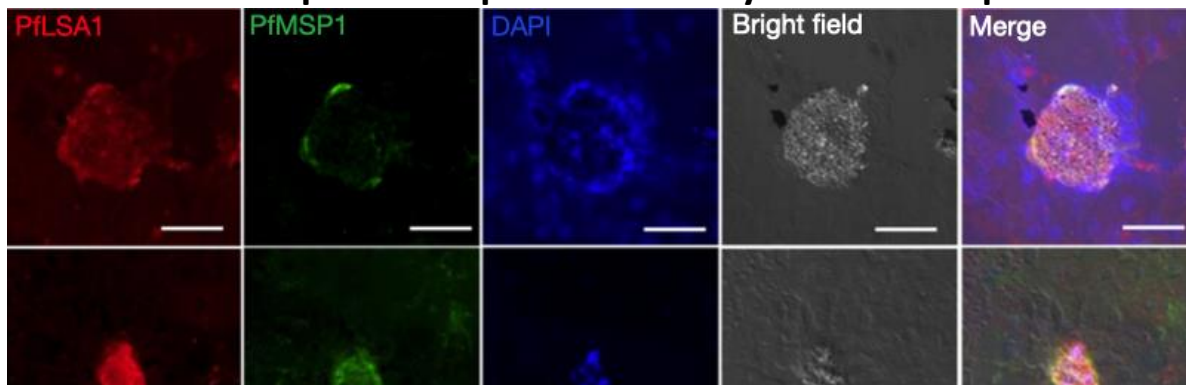
The parasite and the mosquitoes responsible for the transmission of malaria are evolving to become resistant to insecticides used to kill them, and drugs used to treat symptoms. A key goal for new antimalarial drugs, is to prevent parasite spread by blocking their passage from human to mosquito, something that depends on the sexual phase of the parasite life cycle. The Baum laboratory along with colleagues at Imperial College London, UK, previously identified a new class of potent antimalarial compounds, belonging to a family of



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sulphonamides. These compounds prevent mosquitoes from transmitting malaria, by killing the parasite only when it is in a specific sexual phase of its life cycle. Baum and colleagues explored exactly how these compounds work in their new article. [Read more.](#) [Access full article.](#)

In vitro malaria sporozoite production may lead to cheaper vaccines



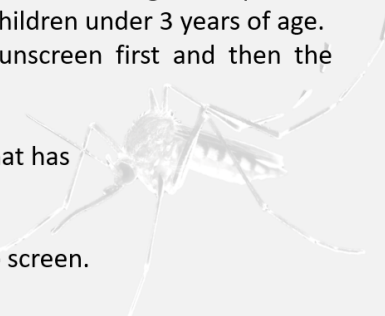
Despite increased funding towards malaria research and vaccine development, the number of deaths from the disease returned over the past three years to the high numbers seen in 2012, with more than 600,000 deaths annually. A group of researchers has documented the first successful cultivation of the necessary vaccine ingredients in vitro. To meet rising demands, vaccine development company Sanaria Inc are working on new vaccines that use at least part of the sporozoite life stage of the protozoan *Plasmodium falciparum*, as the antigenic agent to induce an immune memory of the parasite. Study co-author and physician scientist Stephen Hoffman said; “If you’re a malaria biologist, being able to study the parasite in all of its different stages in the lab is a huge potential development, but of course, for us trying to make a vaccine, it’s beyond enormous.” [Read more here.](#) [Access the full article.](#)

PROTECT YOURSELF FROM MOSQUITO-BITES



Protect yourself from mosquito bites

- Use insect repellents and check the label to make sure they contain DEET, picaridin, oil of lemon eucalyptus (OLE), or IR3535. Always use as directed.
- Insect repellents containing DEET, picaridin, and IR3535 are safe for pregnant and breastfeeding women and children older than 2 months when used according to the product label. Oil of lemon eucalyptus products should not be used on children under 3 years of age.
- If you use both sunscreen and insect repellent, apply the sunscreen first and then the repellent.
- Wear light coloured long-sleeved shirts and long pants.
- Use clothing and gear (such as boots, pants, socks, and tents) that has been treated with permethrin.
- Use insecticide spray as directed to get rid of mosquitoes.
- Use bed nets to protect your sleeping area; in tents use a zip-up screen.
- Stay and sleep in screened-in or air-conditioned rooms.





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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.

Biosecurity Specialists



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[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
