BORDER HEALTH NEWSLETTER – May 2015

WELCOME!

Hi everybody. The sample numbers are very low and it is obvious that most of the adult traps are in hibernation. As you may know, every year since 1996, one week of June (21-27th) is designated National Mosquito Control Awareness Week. This is a time to raise awareness about how mosquitoes affect people's daily lives and draw attention to the services offered throughout the United States and worldwide.

If you would like to help, you can hand out flyers, offer seminars at local community organizations lsuch as Boy or Girl Scout troops, hold open houses, help to collect tires and old containers for disposal and help to distribute repellent packets in your community.

NZB will visit a local school in Wellington and demonstrate New Zealand's mosquito surveillance programme. Watch out for some more news and tips around Mosquito Control Awareness Week on our website www.smsl.co.nz and our facebook page – Southern Monitoring Services/SMSL.MosquitoControl.

SAMPLES

During May 481 samples were collected by staff from 12 DHBs with 120 positive. Amazingly more than 650 *Aedes notoscriptus* adults have been sampled compared to this time last year when only 7 were received. The numbers of Cx. quinqefasciatus are very stable compared to last month and to the same time during last year. No *Coquillettidia iracunda* were found for the period and only 3 *Ae. antipodeus* but good to see so many endemic *Culex astilae* larvae.

Species	Adults		Larvae	
New Zealand Mozzies	**May 2015**	**May 2014**	**May 2015**	**May 2014**
Aedes antipodeus (winter mosquito)	2	Nil	1	1
Ae. australis (saltwater mosquito)	Nil	Nil	2	6
Ae. subalborostris	Nil	Nil	1	Nil
Ae. notoscriptus (striped mosquito)	678	7	819	851
Culex astilae	Nil	Nil	67	33
Cx pervigilans (vigilant mosquito)	3	24	272	175
Cx. quinquefasciatus (southern house mosquito)	75	89	809	466
Opifex fuscus (rockpool mosquito)	Nil	Nil	12	29
Total	**758**	**120**	**1984**	**1419**

INCURSIONS/INTERCEPTIONS

We have had 3 Interceptions in May:

13.5.2015 A dead mosquito was found at the POA in a container with bananas from Ecuador (ship came via Panama) by MPI. It has been identified as an exotic male *Culex. sp*. but further identification was not possible.

[Why is it not possible? Most of the studies and keys are made either for 4th instar larvae or for females, primarily because the younger larval stages do not have fully developed features and the females are the pesky breeding ones, thus they are of more importance in the scientific world. Males are often identified by their genitalia (not kidding) but studies and keys are not available for all groups of mosquitoes.]

22.5.2015 In the MPI inspection room of the Port of Auckland an officer found one live insect associated with a box of rock melon from Australia. This was identified as a chironomid.

25.5.2015 A Mosquito was found by MPI at the AIAL arrival and transferred into alcohol. Auckland PHS were notified after an unknown period and after they dried the mosquito it was sent to the lab and identified as a male *Culex pervigilans*.

PICTURE OF THE MONTH

Children are seen through a mosquito net used as goal post net on the outskirts of Lusaka, Zambia. Photograph: MOSES MWAPE

NEWS OF THE MONTH

Liberia: Govt Warns Against Misuse of Mosquito Nets

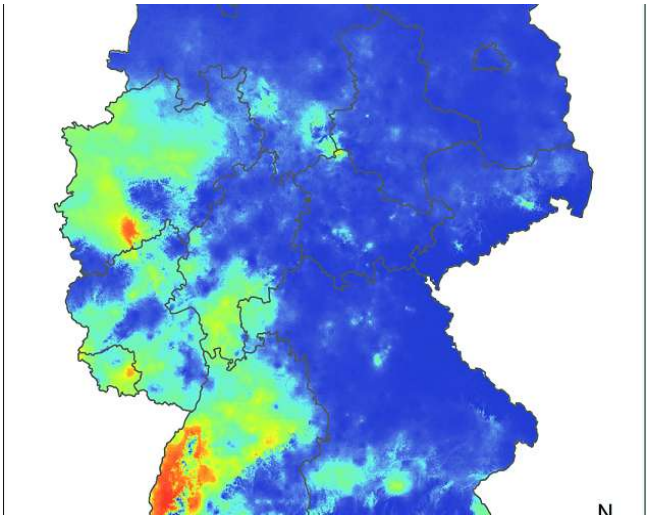
The NEWS (Monrovia) 3 JUNE 2015

The Ministry of Health and Social Welfare through the National Malaria Control Program is calling on Liberians to desist from misusing donated mosquito nets provided by the Government of Liberia.

Addressing a news conference Tuesday, National Malaria Control Program Manager Oliver J. Pratt said there are reports of individuals and communities selling and misusing the nets for football goal

posts, bathing sponges and for fishing purposes, among others.
Mr. Pratt said the nets are high quality specialized malaria prevention tools and the insecticide in the fibers is a safer and superior replacement for all the insect sprays and burning coils currently in use to repel mosquito.
According to him, the Government of Liberia and the Roll Back Malaria Partnership with support from the Global Fund launched the country's first nationwide mosquito nets distribution campaign on April 25, 2015. The campaign, he said, seeks to distribute 2.8 million long lasting insecticide treated mosquito nets free of charge to all households in the country.
He said over two million six hundred and forty-five thousand representing 90 percent has been distributed to approximately 30,333 communities.
He disclosed that during the distribution exercise, some households with fewer families received more of the nets, thus resulting into a shortage. He called on households that have more nets to return some of them to the distribution team for onward distribution.
Pratt revealed that the distribution team has seized some of the nets that were misused or sold. The nets distribution, he noted, is in line with the World Health Organization (WHO) guidelines that encourage governments to provide every family with access to a net.
Pratt pointed out that consultations are underway for the Public Health Law to be reinforced so that individuals or communities who get involved with the misuse of the nets can be arrested.

Modeling identifies mosquito risk hotspots in Germany
Medical Press
Scientists at the Senckenberg Research Center for Biodiversity and Climate and at the Goethe University, in conjunction with other German colleagues, have developed distribution models for the invasive Asian rock pool mosquito. This mosquito species is a potential carrier of vectors for infectious diseases, such as dengue fever or West Nile virus. In a recent study, published in the scientific journal Parasitology Research, the scientists identified new risk hotspots in Southern Hesse, the Saarland and northern North Rhine-Westphalia, and they recommend a careful monitoring of this invasive insect.



In Germany alone, more than one thousand non-native animal species are registered – but most of the introduced species do not survive the winter in our latitudes. "However, the Asian rock pool mosquito is a different case," says Professor Dr. Sven Klimpel, a parasitologist at the Senckenberg Research Center for Biodiversity and Climate and the Goethe University in Frankfurt, and he adds, "These mosquitoes have spread extensively across Germany and Europe in recent years." For the first time, the dipterans were reported in 2008 from southern Baden-Wuerttemberg; since then, populations have also become established in Lower Saxony, Rhineland-Palatinate and North Rhine-Westphalia.

Modeled distribution areas of the Asian rock pool mosquito in Germany. Warm colors (on a scale from blue to red) indicate a higher likelihood of settlement. Credit: Senckenberg

Contrary to the Asian tiger mosquito, the Asian rock pool mosquito is adapted to cooler temperatures and is perfectly able to cope with the climatic conditions in Central Europe.
While other invasive species do not constitute a threat and may even enrich the species diversity, the Asian rock pool mosquito is a potential carrier of dangerous infectious diseases or their vectors,

such as dengue fever, the Japanese encephalitis or the West Nile virus. "To date, the transmission potential has only been confirmed in the laboratory and not in the outdoors. However, the West Nile virus could already be isolated from wild-caught mosquitoes in the USA," explains Klimpel.
In their study, the parasitologists and infection biologists have modeled potential distribution areas for this mosquito. To this end, they combined various factors, such as the monthly average temperature or the months with the lowest precipitation with mathematical variables and the actual discovery data. "This methodology enables us to predict the distribution of a species on the basis of incomplete observations and samples," explains Klimpel, and he adds, "This is necessary, since there is no systematically designed sampling procedure for the mapping of the exact distribution area to date – not least for cost reasons. "In order to better be able to coordinate future monitoring and prevention programs, it is essential to know and localize potentially favorable regions for this mosquito species. "Our modeling clearly shows that besides the already known areas in Baden-Wuerttemberg, Rhineland-Palatinate, North Rhine-Westphalia and Lower Saxony, Southern Hesse, the Saarland and the northern parts of North Rhine-Westphalia also constitute climatically favorable areas for the Asian rock pool mosquito," according to Klimpel's summary of the scientific study. On the basis of these results, the monitoring of the Asian rock pool mosquito can be done in a more focused and systematic fashion, and sampling may be conducted efficiently, fast and cost-effectively.

VECTOR-BORNE DISEASES

Recent Local News

Dengue deaths in American Samoa

4.6.2015

Health authorities in American Samoa are concerned by the deaths of two people from dengue fever as there has not been any increase in reported cases of the disease for some time.
The deaths, which occurred last month, has been confirmed in lab analysis carried out at the Center for Disease Control.
The infection prevention nurse at LBJ Hospital, Sharmaine Mageo, says the deaths of a 10-month-old baby and a 37 year-old male have officials worried.
"We haven't had an outbreak here since 2008-2009, so it really is quite a concern that we are starting off the last couple of months with cases are now coming in positive."
The Department of Health's Epidemiologist Scott Anesi says it unusual that a dengue case which presented as flu like would quickly develop into hemorrhagic dengue.
He says the Department is investigating the two cases and pointed out that the travel history of the two who died is important to determine if they caught dengue in the territory or from neighboring countries.
There's been an outbreak of dengue reported in some nations in Pacific.

Chikungunya virus spreads to half of Pacific

28 May 2015 Radio New Zealand international

The mosquito borne chikungunya virus has now reached half of the Pacific and is likely to spread to non-affected countries in the region over the next five years.
The Secretariat of the Pacific Community says the first outbreak of chikungunya was detected in New Caledonia in 2011 and since then 14 outbreaks have been reported by 11 of the 22 Pacific Island nations.
The SPC's Deputy Director of Public Health Dr Yvan Souarès told Jenny Meyer about the illness and his appeal for urgent action.
Dr Yvan Souarès says five countries are currently experiencing outbreaks, with growing number of cases in the Marshall Islands and the Cook Islands and ongoing cases in Kiribati, Samoa and

American Samoa.
He says previous outbreaks in French Polynesia, New Caledonia, Papua New Guinea, Tonga and Yap are reportedly over for now.
YVAN SOUARES: Chikungunya is a bit tricky, like dengue or zika virus for example. Because the mosquito that spreads the virus, ie, *Aedes aegypti*, this mosquito is almost present in all the region and every Pacific island at the moment. This mosquito has a tendency to bite during the day. As opposed to mosquitos spreading malaria, for example which are actually biting during the night. Therefore sleeping under a mosquito net is fine, in terms of chikungunya spread, it's always better. But it doesn't prevent most of the bites, which happen during the day. Hence mosquito nets would be a lot useful for patients that have already been infected and that are getting fevers and the virus, in high quantities, is circulating in their blood. Hence the mosquitos biting these people can infect themselves with the virus and twelve days later they will be able to contaminate other people.
JM: What's the current state of the Pacific in terms of health organisations being able to respond effectively, to treat these patients and try and minimise the long term disabling effects of it?
YS: The best placed agencies are the governments themselves and that has to be stressed. Because if surveillance and response to any disease in the Pacific is to one day become sustainable, it will come from the countries, not from external agencies. However for the moment some help might be needed from time to time. Pacific islands hardly have suitable vector control services. And SPC and my programme especially, has been calling for some regional initiatives in that sense, for now several years. Unfortunately on that one we haven't been heard yet.
JM: What would you like to see happen? When you say you haven't been heard yet, who needs to hear and what the core message?
YS: Absolutely all the stakeholders. Starting with the countries themselves, the island countries themselves. But also all the development partners. The emergency in the Pacific in terms of mosquito borne diseases, the most urgency is to be able to fight the mosquitos. And this is exactly where the services are extremely low and extremely poor. We don't have any vaccine, we don't have any specific treatment for chikungunya virus. Hence the only way remaining to fight the disease is to try to control the mosquitos. And that is precisely what the Pacific Islands are not equipped at all for doing.
JM: Is this a bit of a wake up call, this information that you have recently collated and put together on the current state of chikungunya in the Pacific? Is it a wake up call for action?
YS: I'm a little saddened by your question Madam, and not because of yourself in particular. If I would answer "Yes, this is a wake up call", I would deny the work that SPC in particular, and my team especially have been doing for the last four years. We've been publishing papers, informing the media, in the past four years, repeatedly, about the wave of mosquito borne diseases that the Pacific Islands are facing. We've been calling for multiple sources of solidarity, help, aid, networking and the like. You may review our PR in that period of time. So if this is for some people, and major stakeholders; like media, external agencies, governments and the rest; if this is the 'wake up call' then fine. I mean it's better now than never. But calling it a 'wake up call' when half of the countries have been already hit and affected, I think is a little bit cynical.
JM: How many people do you estimate have actually been infected with chikungunya? And do you have a number of fatalities overall in the region?
YS: Well what I can tell you for example is that the estimates are that 50,000 to 60,000 people have been affected in French Polynesia. That about, over ten thousand cases have been affected in Tonga. That close to 10,000 to 20,000 cases have been affected between American Samoa and Samoa and Tokelau. In Papua New Guinea, where the first major outbreak started in the region, the latest estimates that we have, long before circulation had stopped was 15,000 cases. And Papua New Guinea may be estimated at the magnitude of French Polynesia in my view. So we are talking about a hundred thousands of people at the moment probably. There has been very few deaths in

fact, in French Polynesia a handful, about 12 to 15 deaths.
JM: Where does the future lie for the Pacific region with this disease?
YS: What we can infer is that half the countries that have not been affected will be affected. And then in a number of years, in five to ten years, the virus will emerge again.
JM: So do you feel in some ways that this is milestone, like a canary in the coal mine, for the rest of the world, regarding chikungunya that people must be alert to this virus?
YS: The situation with mosquito borne diseases is certainly worsening. This is the wake up call that my team and SPC and I have been trying to spread around the region for the past four years. And we are very happy that now everybody hears the 'alarm clock'.

Chikungunya under control
The Fiji Times Online by Tevita Vuibau June 03, 2015
LOCALS can breathe a sigh of relief after the Ministry of Health revealed yesterday that there have been no other cases of chikungunya reported.
Ministry spokesman Sunil Chand says the cases in the country have been limited to the three individuals who had the illness when they came in from overseas.
"There are no localised cases at the moment in Fiji. Since the symptoms are similar to dengue, people who were presented at the health facilities were checked and upon lab tests turned negative," Mr Chand said.
"Altogether, three cases were reported and they were imported cases. We do not have any localised cases at the moment."
He explained that symptoms of chikungunya began three to seven days after being bitten by infected mosquitoes and, includes high fever, joint pains with swelling and stiffness, headache, muscles pains and fatigue.
"Most will recover within a week, although joint pains may persist for months or years in some cases.
"Although the disease is rarely fatal, the socioeconomic burden that comes with massive numbers missing work and school as a result of the disease is immense, as experienced in other Pacific Island countries that are currently dealing with the epidemic."

WPRO: Pacific syndromic surveillance report
Week 22, ending 31 May, 2015
Chikungunya outbreak is on-going in Cook Islands and Marshall Islands. Weekly number of cases in Kiribati has reduced significantly.
Cook Islands report a total of 616 cases including 44 new cases in the week to 31 May 2015.
As of 4 June 2015, Marshall Islands reports 629 cases since February 2015.

Dengue American Samoa has released reports of dengue related deaths currently under investigation. Tere were 28 confirmed cases in the week end 24 May 2015 in French Polynesia. There has been an increase in the number of confirmed cases over the past three weeks. Dengue serotype-1 has been identified by the Institut Louis Malarde (ILM), French Polynesia.
There is a reduction in the number of cases reported from the outbreak in the Macuata Province, Northern Health Division, Fiji. Dengue serotype-2 has been identified by the ILM, French Polynesia.
Tonga dengue serotype-3 has been identified by Labplus, Auckland, New Zealand. The weekly number of cases is decreasing.

Zika Virus An outbreak is ongoing in Solomon Islands. As of week end 24 May 2015 there have a total of 310 cases since February 2015. The weekly number of cases is decreasing.

Asia

Hong Kong reports 1st local transmission of dengue fever this year

Outbreak News Today June 2, 2015

Hong Kong health officials announced today they are investigating the first local case of dengue fever (DF) this year prompting encouragement for the public to maintain strict environmental hygiene, mosquito control and personal protective measures both locally and during travel.

"We are highly concerned about the local case and are working closely with the Food and Environmental Hygiene Department (FEHD) for all-out efforts to assess and prevent any spread of infection," Dr Chuang Shuk-kwan remarked.

The male patient, aged 58 with good past health, has presented with fever, headache, muscle pain, diarrhea and rash since around May 25 and consulted a private doctor, attended a general out-patient clinic and consulted a Chinese medicine practitioner. He subsequently attended the out-patient department of a private hospital on May 31 and was admitted for management. His fever subsided after admission. He has been in stable condition all along and was discharged today.

His blood sample tested positive for dengue antigen and IgM antibodies upon testing by the CHP's Public Health Laboratory Services Branch today.

Initial enquiries revealed that the patient lives in Grandway Garden, Sha Tin, New Territories and worked at Cheung Hing Mansion, 15 Cheung Wong Road, Prince Edward, Kowloon. He recalled frequent mosquito bites near his residence. He mainly stayed at home and went to work during the incubation period, and he also went to work after onset. He had no travel history outside Hong Kong one month before onset of symptoms.

The patient's home contact has remained asymptomatic so far and has been put under medical surveillance.

To date, 35 DF cases have been confirmed this year including this local and 34 imported cases. In 2014, there were three local and 109 imported cases. In 2013, 103 cases were filed and all were imported.

Americas

Public Health issues alert for Zika Virus

Cayman 27 By Kevin Watler 22 May 2015

Public Health authorities have issued an alert for the Zika Virus. It's a mosquito-borne virus that's been circulating in the pacific and North-Eastern Brazil.

Also known as Zika-V, it causes illness similar to dengue and chikungunya and is transmitted mainly by the Aedes aegypti mosquito. Medical Officer of Health, Dr Kiran Kumar, says while there have been no cases in the Caribbean, the alert is being issued as a precautionary measure.

"The public is urged not to be alarmed in hearing the name of another mosquito borne disease. Instead, it is encouraged to take precautionary measures against transmission…whether in the Cayman Islands or on travels."

WORLD OF MOSQUITO SCIENCE

Gene turns female mosquitoes into males

Science by Kai Kupferschmidt 21 May 2015

The female of the species is more deadly than the male, the famed author Rudyard Kipling wrote, and that's certainly true for the mosquito *Aedes aegypti*, also known as the yellow fever mosquito. Only females feast on human blood, transmitting not only yellow fever but also dengue and several other diseases. But what if you could turn all mosquitoes into males? That's a possibility raised by new research that pinpoints the gene that determines whether a mosquito becomes male.

Scientists have known for decades that at least one gene that makes *A. aegypti* embryos male

resides on a stretch of DNA on chromosome 1. They named that region the M locus, but until now they were unable to pinpoint the specific gene. Part of the problem: The region contains large amounts of repetitive DNA, making it difficult to sequence that region. (Imagine a huge jigsaw puzzle of the sea: It's almost impossible to know which piece belongs where.) In fact, as it turned out, an A. aegypti genome published in 2007 does not even contain the newly identified gene. "It's very small and it was thrown out with the trash," says Zach Adelman, a molecular geneticist at the Virginia Polytechnic Institute and State University in Blacksburg and one of the authors of the new paper.

To find the gene, Adelman and his colleagues sequenced thousands of pieces of DNA from male and female mosquitoes belonging to two different strains of A. aegypti and looked for stretches that were more common in males of both strains. They found 164 such sequences and matched them against data showing what genes are active in embryos, looking for sequences that seemed to be active in early male embryos. In the 24 sequences that remained, they found one new gene, which they named Nix.

About half of the female embryos injected with a piece of DNA containing that gene developed male genitals, the researchers report online today in Science. (They did not check whether these animals would be able to bite humans and transmit diseases.) “The exact sequence of events that leads to mosquitoes developing as males is not clear," Adelman says. “But we know that Nix is at the top of that cascade and that is what counts.”

“This is excellent basic science and it has potential for genetic control strategies,” says Bart Knols, an entomologist who owns In2Care, a company in Wageningen, the Netherlands, that develops mosquito traps. A first application would be to help with control strategies that already exist. A company called Oxitec, for instance, has produced mosquitoes that carry a lethal gene that kills offspring in early development, which can drastically reduce mosquito populations. But half the mosquitoes produced are females that cannot be released, because they could themselves help spread the diseases they are designed to combat. “The whole system would be cheaper and more efficient if you could produce only males,” Knols says.

First, however, scientists need to show that they can accomplish full sex conversion, Knols cautions. Only some females became male in the study, because the Nix gene needs to be integrated into the genome of the mosquitoes for the protein to be produced in sufficient quantities, Adelman says. “If it is produced all the time in all the tissues, we will hopefully get fully converted, fully fertile males. We are very much working on that.”

In the long term, that could lead to another strategy. Scientists recently reported a system that allows them to push a certain gene into the next generation at almost 100% frequency. Coupling the Nix gene to such a system would essentially create a chain reaction spreading the male gene. “If you release such an animal, it only produces males until eventually the population crashes,” Adelman says. But it is far too early to apply such a technique, he admits. “We need the technology to control these systems before that can be used.”

MOSQUITO DISCUSSION

Spraying, misting offers mosquito control for more homeowners

WMAZ Lorra Lynch Jones 6 June 3, 2015

More than 176 species of pesky mosquitoes live the U.S., and Georgia hosts one of the most dense populations. To help fight them off, a growing number of mosquito misting and spraying businesses are hatching onto the market. They include companies like Backyard Pest Control, which offers mosquito misting and barrier sprays for your yard. Owner Jason Turner said, "There's been more companies pop up." Turner says their misters attach to the side of houses and sit in foliage and flower beds. A remote control releases chemicals from a tank twice a day, for 30 seconds.

Turner called the misters "a more permanent option." They also cost much more up front than

barrier sprays applied every three weeks. Misters can cost a couple thousand to stall, plus quarterly maintenance but hover around $50 a treatment.

Turner said, "It is not harmful to humans or pets at all." The Environmental Protection Agency approves the chemicals saying, "They don't expect risks to humans", but no pesticide is "100-percent risk free." The Department of Agriculture regulates pesticide use in Georgia and issues commercial licenses. University of Georgia Extension Agent for Houston County, Charlotte Meeks, says you should ask for the pesticide companies' license, before you buy.

Meeks said, "The label is the law. That's what has to be followed by the company that's spraying it."

She says companies can overspray, and if they do, other insects, such as honeybees and butterflies, can fall victim. Meeks also notes that the sprays help control mosquito populations. They don't prevent mosquito-born disease. She says the treatments work best used with time-tested methods. Meeks said, "Making sure you don't have standing water in your yard. Trimming your bushes, mowing your grass." Turner says the sprays zap between 85 and 95-percent of mosquitoes. The American Mosquito Control Association, which partners with the EPA, says they have a number of concerns about spray systems. Their top worries are unnecessary insecticide use, a lack of data showing that they actually control mosquito populations, and pesticide exposure.

Technician adjust mosquito misting system. (Photo: WMAZ)

DID YOU KNOW?

The Best Way to Relieve An Itchy Mosquito Bite (Without Scratching)

Yahoo Health Laura Tedesco June 1, 2015

A mosquito touches down on your arm, and next thing you know, there's that telltale red bump — and boy is it unbearably itchy.

Scratching is nothing more than a distraction — a pleasurable way to direct your attention to something other than the itch that's annoying you. "You're not accomplishing anything medically," says Dan Wasserman, MD, a dermatologist in Naples, Florida.

Anything positive, that is.

What you are doing: potentially damaging the skin you're scratching. "You can actually [create] permanent changes in your skin," Wasserman tells Yahoo Health. If you break the skin, you may be left with a scar or something called a dermatofibroma. These firm little growths — or what Wasserman refers to as "scar balls" — are most likely to crop up in areas below the knee, such as your ankle and the lower part of your shin. (And, really, who hasn't gotten a pesky ankle bite while wearing flip-flips?)