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# Bulletin of the Entomological Surveillance Network : *Aedes aegypti* survey in Nouméa and Dumbéa.

*With the collaboration of the city councils of Nouméa and Dumbéa.*

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## Introduction

In Nouméa and Dumbéa, the only known vector of dengue, chikungunya and Zika viruses is *Aedes aegypti*. Monitoring the evolution of *Ae. aegypti* populations' densities provides us with a better understanding of epidemic risks and enables us to take appropriate measures if necessary. This monitoring is carried out by the Entomological Surveillance Network (ESN), which

was set up at the joint initiative of the Department of Health and Social Affairs of New Caledonia (DASS-NC), the Institut Pasteur of New Caledonia (IPNC) and the city councils of Nouméa, Dumbéa and Mont-Dore.

This bulletin presents the evolution of the entomological situation in Nouméa for the last 12 months.

## Entomological indices description

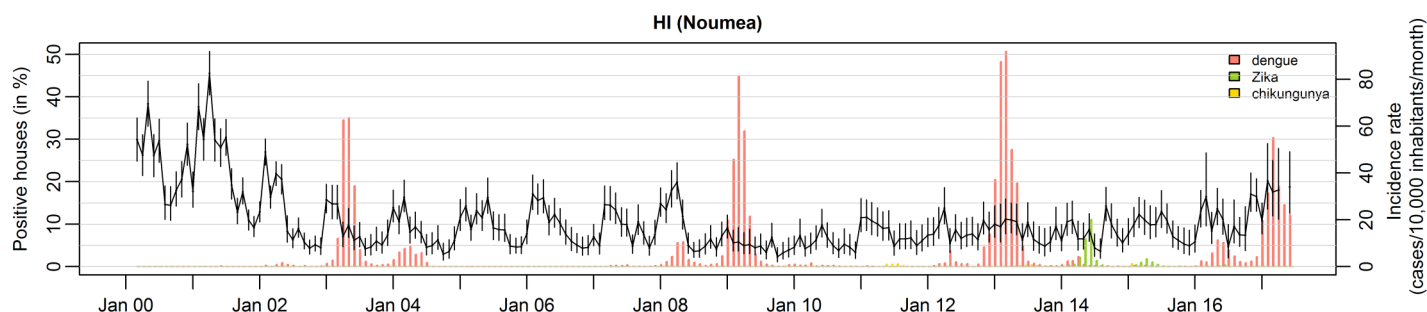
A "positive breeding site" refers to any object containing stagnant water in which at least one larvae is found (including first development stage larvae).

**The Houses Index (HI):** estimates the percentage of houses where at least one positive breeding site is found.

**The Breteau Index (BI):** estimates the number of positive breeding sites found for 100 houses.

These indices are calculated for the specie *Ae. aegypti*.

## Historic of the entomological situation



**Figure 1: Monthly evolution of the Houses Index (HI) in Nouméa, from 2000 to 2017 and epidemics of arbovirosis over the same period.** The Houses Index (HI) estimates the percentage of houses where at least one positive breeding site is found. Between 200 and 300 different houses are visited every month in Nouméa. The vertical bars on the index curves (in black) represent the 95% confidence intervals. Incidence rates for confirmed and probable human cases of dengue (red), Zika (green) and chikungunya (yellow) are also represented for Nouméa. More information about the entomological situation history of Nouméa and Dumbéa can be found in the Bulletin N°01/16 (<http://www.institutpasteur.nc/bulletins-reseau-de-surveillance-entomologique/>).

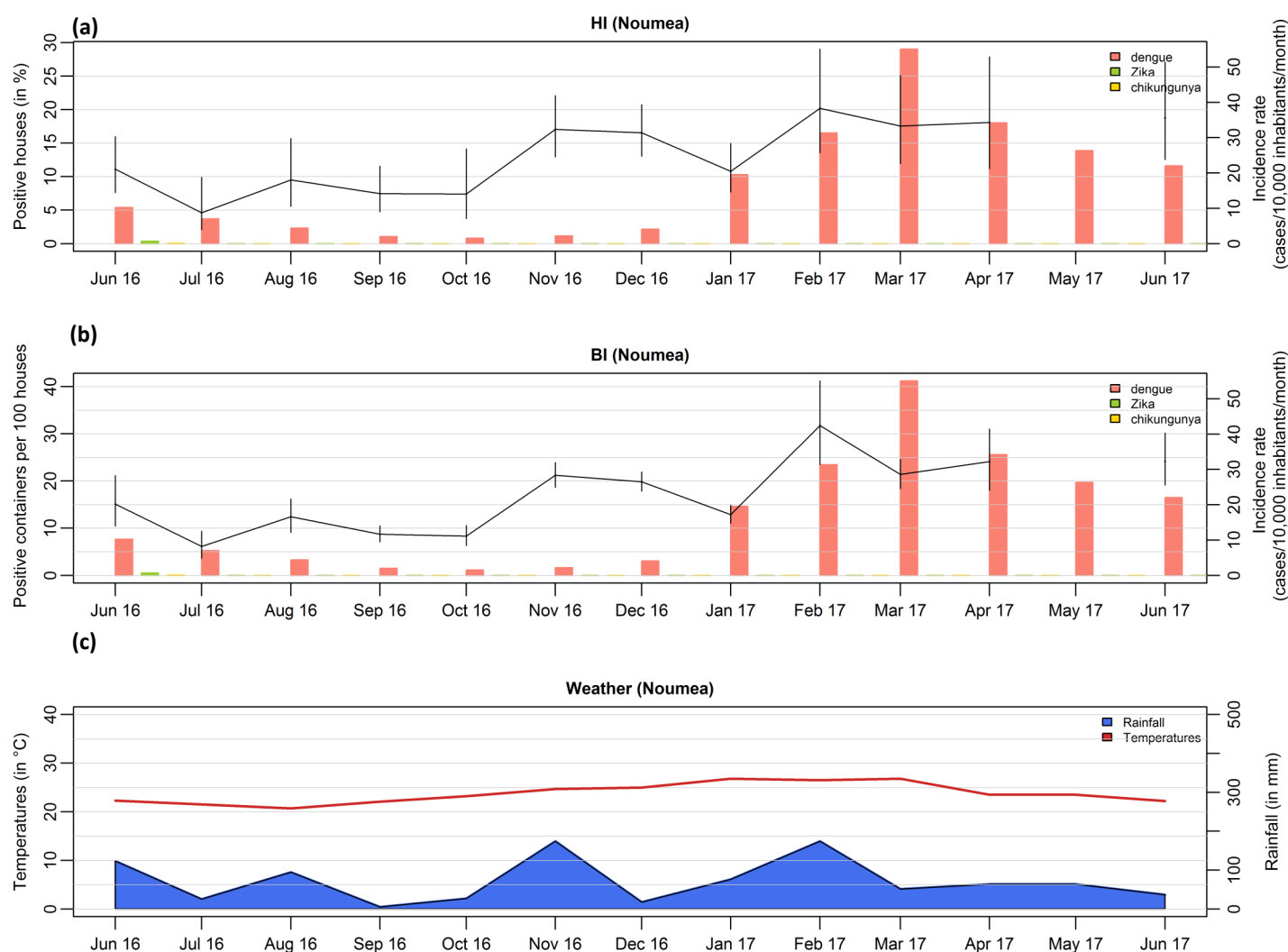
## Current Entomological Situation in Nouméa

The number of dengue cases in New Caledonia strongly increased at the beginning of the year. Due to the epidemic, the staff usually dedicated to the surveillance was reassigned to prevention and vector control activities in order to control the dengue epidemic. Thus, for February, March, April and June 2017, only 30 to 50 houses were followed by sector (instead of approximately one hundred). In May, no monitoring was undertaken, due to the cyclonic events in New Caledonia.

The entomological indices BI and HI remain high while temperatures and rainfall have been declining for 3

months (Figure 2c). In June, there was on average 20 positive houses for 100 houses visited (BI, Figure 2b) and approximately 17% of the houses had at least one positive breeding site (HI, Figure 2a). Since early 2017, the entomological situation is similar to the one observed between 2003 and 2008.

Although the number of reported cases of dengue fever has been decreasing since April, dengue circulation throughout the fresh season is a concern.

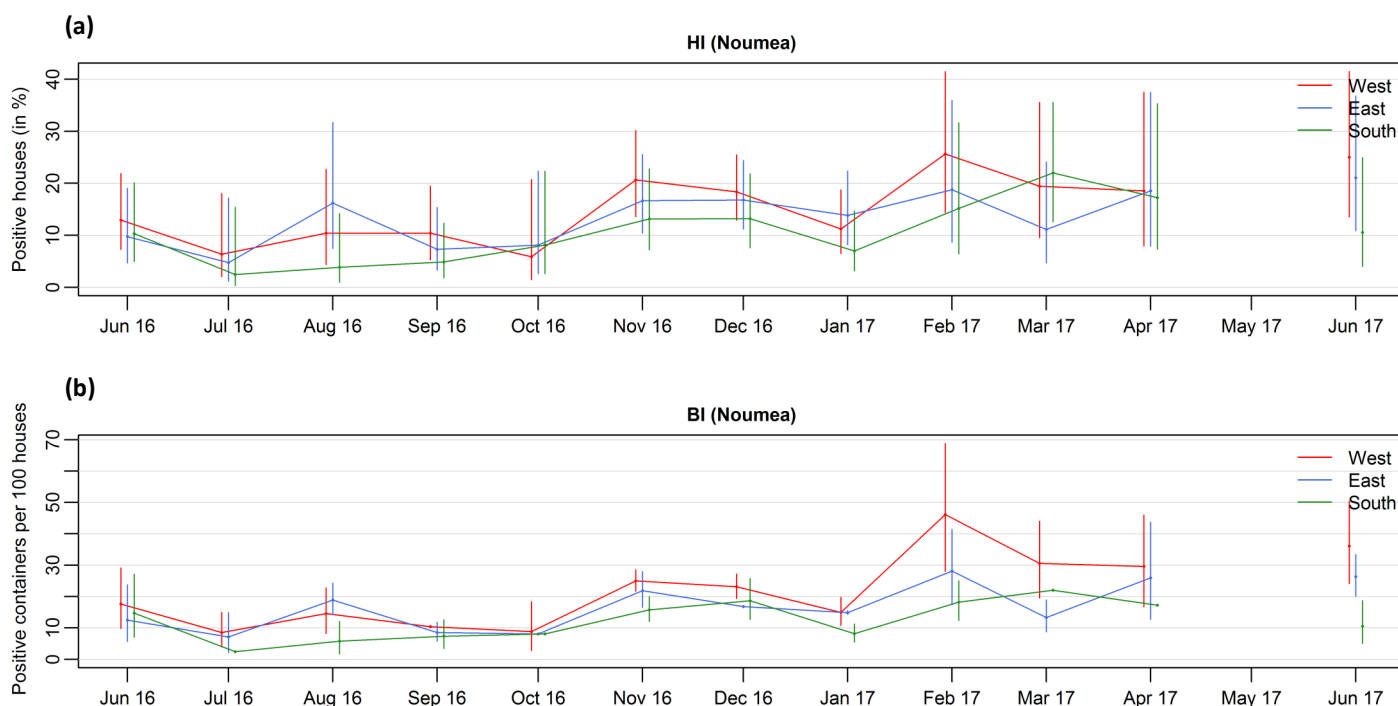


**Figure 2: Monthly evolution of entomological indexes and effects of dengue, Zika and chikungunya on Nouméa from March 2016 to March 2017.** (a) HI estimates the percentage of houses where at least one positive breeding site is found. (b) BI estimates the number of positive breeding sites found for 100 houses. The vertical bar on the index curves represents the 95% confidence intervals. Incidence rates for confirmed and probable human cases of dengue (red), Zika (green) and chikungunya (yellow) are shown for the city of Nouméa (source: DASS-NC). (c) Weather data are presented for Nouméa (source: Météo France).

## Entomological indices by sector: Nouméa (3 sectors)

The details of the indicators by sector (Noumea West, East and South) are shown in Figure 3. The West and East sectors present about 20% and 25% of houses with at least one positive breeding site. In the South sector, HI is about 10% (HI, Figure 3a).

The Breteau Index (BI) is lowest for the sector South, with about 10 positive breeding sites found for 100 houses. This index is highest in the West sector, with about 35 positive breeding sites found for 100 houses. In the East sector, approximately 27 positive breeding sites were found for 100 houses (Figure 3b).



**Figure 3: Monthly evolution of entomological indexes by sector from June 2016 to June 2017.** (a) HI estimates the percentage of houses where at least one “positive” breeding site is found (b) BI estimates the number of positive breeding sites found for 100 houses. The vertical bars on the index curves represent the 95% confidence intervals.

## Contact and useful links

**Contact :** Morgane POL (mpol@pasteur.nc)

### To know more about :

Institut Pasteur of New Caledonia web-site (French):

<http://www.institutpasteur.nc/les-moustiques-et-la-dengue/>

Department of Health and Social Affairs of New Caledonia (DASS-NC) web-site (French):

[http://www.dass.gouv.nc/portal/page/portal/dass/observatoire\\_sante/veille\\_sanitaire/](http://www.dass.gouv.nc/portal/page/portal/dass/observatoire_sante/veille_sanitaire/)

The Pacific Community (SPC) web-site (English available) :

<http://www.spc.int/phd/epidemics/>

