

No adverse effects from vector control: a finding that will need to be confirmed in the coming years



Vector control against the tiger mosquito, responsible for diseases such as dengue fever, Zika and chikungunya, involves spraying mosquito repellent. Although no poisonings were recorded by poison control centres in 2022, not all cases were necessarily reported through this channel, and vigilance is still required with the increase in mosquito eradication operations in mainland France.

In the growing number of French départements where it has become established, the tiger mosquito *Aedes albopictus* is regularly detected as soon as temperatures start to rise. This mosquito can carry viruses responsible for arbovirus diseases such as dengue fever, Zika and chikungunya. These viruses are transmitted to humans by the bite of infected female mosquitoes.

A person can be infected by a virus in a country or region where it is circulating – whether in the French overseas territories, Asia or on the American continent, for the dengue virus in particular – and then develop clinical signs on their return to mainland France. The case is then said to be imported.

If a person is infected with the dengue virus during a trip and is still infectious when they return to France, a mosquito that bites them and then bites another person could transmit the virus to this second person. A case of this type is said to be indigenous (or autochthonous), as the person infected in France has not travelled to an area where the virus is circulating in the 15 days prior to the onset of symptoms. Sometimes, the imported case responsible for transmission can be found in close proximity to the indigenous case(s), for example, a neighbour living in the same street or neighbourhood.

STOPPING TRANSMISSION THROUGH VECTOR CONTROL MEASURES

Whether the case is indigenous or imported, it is necessary to identify anyone who may have been infected by a mosquito carrying the virus responsible for the disease, and who may have developed a mild form of the disease without reporting it. This is achieved through door-to-door surveys and communication campaigns targeting healthcare professionals, to encourage them to consider these diseases – which they may not expect in people who have not travelled – in their diagnoses. These diseases are also notifiable by doctors.

When these individuals have been identified, to interrupt the chain of transmission, the Regional Health Agency carries out mosquito eradication operations to eliminate any adult mosquitoes that may have bitten

infected people and then become infected themselves. A mosquito repellent based on a pyrethroid active ingredient, essentially deltamethrin, is sprayed at night in a 150 m radius around the homes of all these infected individuals and the places they frequented during the period when the virus was in their blood – this is the contagious period during which the person can transmit the virus to a mosquito if bitten. All residents in the area likely to be exposed to the sprays must be informed in advance, by any appropriate means of communication, to keep their doors and windows closed.

ANALYSIS OF CALLS TO POISON CONTROL CENTRES IN CONNECTION WITH MOSQUITO ERADICATION TREATMENTS

Have all the people potentially exposed to these sprays been properly informed? Has anyone been sufficiently bothered to call a poison control centre? To answer these questions, all calls received by a poison control centre during 2022 following the spraying of a product in connection with vector control were analysed.

Although it was not possible to determine the number of vector control treatments carried out, data from Santé Publique France, the health agency responsible for monitoring arbovirus diseases, indicated that 2022 saw a particularly high number of cases of these viral diseases, with each one leading to mosquito eradication operations. According to Santé Publique France [1] «In 2022, 378 imported cases of dengue, 23 of chikungunya and six of Zika were notified in mainland France. Nine episodes of autochthonous dengue transmission totalling 66 cases were documented: five episodes in Occitanie (12 cases), three in Provence-Alpes-Côte d’Azur (52 cases) and one in Corsica (two cases). Six episodes occurred in départements where no autochthonous cases had been notified to date. Autochthonous dengue transmission is now expected in the south of France, but the epidemiological situation was exceptional in 2022: an increase in the number of episodes, their intensity and the geographical areas affected».

VERY FEW CALLS AND NO SYMPTOMS

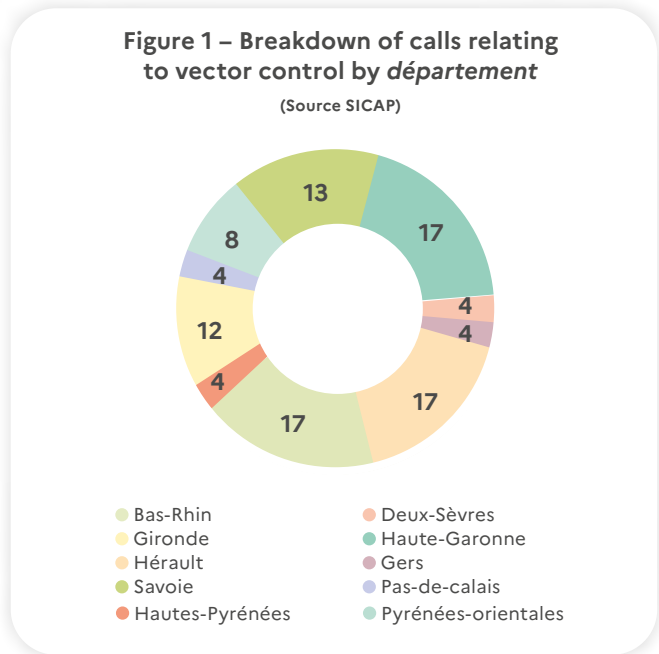
All calls from January to December 2022 for which the dossier included a reference to the agent deltamethrin or «vector control», were analysed.

There were a total of 31 dossiers over the whole period, from 10 départements (Figure 1). Three dossiers were excluded because they concerned occupational exposure, which was not the target population for this study, and four others because they involved domestic exposure due to mosquito repellent treatments applied by the users themselves and not by the health authorities.

Of the remaining dossiers, 19 people had called the PCC

to ask for details of the vector control procedures (date, etc.), the products used and the potential effects on human or animal health.

Five people had been exposed, but none exhibited any



symptoms:

- a pregnant woman had slept with her window open because she had not been warned, and was worried about her pregnancy and her baby. She had no symptoms but was bothered by the smell;
- a family consisting of a couple and an eight-month-old child had not received the brochure and had slept with their window open. None of the three had any clinical signs;
- the last person had been carrying out work in their home at night, with the windows open. They reported a bitter taste in the mouth, without any other symptoms.

VIGILANCE TO BE MAINTAINED

These results appear to be satisfactory from a health point of view, although it should be noted that a few people had not been reached by the information campaign on the night-time vector control operation. However, they should be treated with caution. It is likely that not everyone who was bothered called a poison control centre, since they were not necessarily explicitly told to call in the event of any discomfort. An analysis of data collected from general practitioners and emergency services would be a useful addition to this review.

Vigilance is therefore still needed. Repeating this study

for 2023, at a time when vector control campaigns have been particularly numerous, would enable the absence of adverse effects in the general population recorded by the PCCs to be confirmed or refuted.



Florent Battefort (Toulouse PCC)
Juliette Bloch (ANSES)

REFERENCES

[1] Arboviruses surveillance in mainland France: significant increase in the number of autochthonous dengue cases in 2022
<https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-a-transmission-vectorielle/dengue/documents/article/surveillance-des-arboviroses-en-france-metropolitaine-nette-augmentation-des-cas-de-dengue-autochtone-en-2022>