



**Pan American  
Health  
Organization**



**World Health  
Organization**

REGIONAL OFFICE FOR THE **Americas**

## **Key messages for individuals and families regarding surveillance and control of *Aedes aegypti*: transmitter of dengue, chikungunya, Zika and other arbovirus diseases in the Americas**

The following document is aimed at Vector Control Programs of the ministries of health of the countries, along with their communication and social mobilization national teams, in order to adapt the information according to their specific needs of each country and the targeted public. The information presented below is of a technical nature on general aspects of *Aedes aegypti* and the recommendations to contribute to its control and to prevent and/or reduce the risk of transmission of dengue, chikungunya, Zika and other arboviruses in the Americas.

### **The vector:**

- *Aedes aegypti* is the vector that poses the greatest risk for the transmission of arboviruses in the Americas and is present in almost all countries in the Hemisphere (except Canada and continental Chile). It is a domestic mosquito (living in and near homes) that reproduces in any artificial or natural recipient containing water.
- The mosquito can complete its life cycle, from egg to adult, in 7-10 days; adult mosquitos generally live 4-6 weeks.
- The female *Aedes aegypti* is responsible for transmission of these diseases because it needs human blood, mainly for the development of its eggs and for its regular metabolism. The male does not feed on blood.
- Female *Aedes aegypti* feeds every 3-4 days; however, if they fail to extract sufficient blood, they continue to feed every moment they can.
- The mosquito is most active in the early morning and around dusk, making these the periods of highest risk for bites. However, females that need to continue feeding will look for a blood source at other times.
- *Aedes aegypti* has a short range and does not usually fly more than 25 meters, provided that food is available in dwellings near its breeding sites. However, mosquitoes have been observed to fly as far as 400 meters in search of food.
- After feeding, *Aedes aegypti* lays its eggs every 3-4 days in different containers, ensuring that some of its offspring will survive predators and making the mosquito more difficult to control. This indicates the importance of disposing of unused containers in and around the home, and protecting useful containers that store water (sealing them or treating them with chemical or biological products).
- *Aedes aegypti* prefers to lay its eggs in artificial recipients that contain water (drums, barrels, and tires, mainly) in and around houses, schools, and workplaces.
- Females can lay some 400 eggs in the course of their lives. The number of eggs laid each time depends on the age of the female and the amount of blood extracted.
- *Aedes aegypti* eggs can resist dry environmental conditions for more than a year: in fact, this is one of the most important strategies the species employs to survive and spread. Properly cleaning the surfaces of drums and barrels is more effective than using chemical



**Pan American  
Health  
Organization**



**World Health  
Organization**

REGIONAL OFFICE FOR THE **Americas**

or biological products, since cleaning also destroys the eggs, which are always attached to surfaces in breeding sites.

### **Vector control**

- The risk of transmission of these diseases resides primarily in the presence of mosquito vectors, *Aedes aegypti* being the leading transmitter in the Americas. If there were no mosquitoes, none of these diseases would be transmitted.
- Patients, other household members, and the community need to be educated about the risk of transmission and about measures to reduce both the amount of mosquitoes and contact between the vector and people.
- Measures to physically control the mosquito's breeding sites are the most effective, with the greatest impact on vector populations. Physical control of mosquito breeding sites inside and around dwellings, and in public and/or private places, should be a responsibility shared by everyone—authorities, public sector, private sector, NGOs, families, and individuals—not just the public authorities or the health sector.
- Mosquito control operations are necessary and essential for reducing the risk of transmission of these diseases, but they cannot solve the problem entirely. The elimination of breeding sites should be the main control measure, since it is both the most effective and most sustainable one.
- To eliminate mosquitoes the following actions are recommended: avoid the collection of water in outdoor containers (pots, bottles, or other containers that can collect water) so that they do not become breeding sites for mosquitoes; keep tanks and water deposits covered to keep out mosquitoes; avoid accumulating trash, throw trash in closed plastic bags, and place in closed containers; and unclog drains that may leave standing water.
- Considering the hours when the vector is most active, it is recommended that actions aimed at controlling adult mosquitoes outside the home should be carried out at dawn and dusk. It is therefore essential that people/families be informed some days beforehand regarding the schedules in their neighborhoods, so that they can keep their doors and windows open to allow the insecticide into their homes.
- When insecticides are applied in homes by health professionals or others, it is important that kitchen utensils and food and water for human and animal consumption are well covered or kept in closed places.
- When insecticides are applied inside homes by health professionals or others, it is necessary for residents to leave during the treatment and to keep the home closed for at least 20 minutes after fumigation to ensure that the mosquitoes have been killed.
- PAHO/WHO-recommended insecticides for adult mosquitoes and larvae are safe and effective for public health use, provided that the technical standards for application are followed (WHO/CDS/WHOPES/GCDPP/2006.1).
- It is important to minimize contact between the vector and patients infected with dengue, chikungunya, or Zika virus. This helps to prevent the spread of the virus and the disease. Patients suspected of having dengue, chikungunya, Zika, and other arbovirus diseases should rest under mosquito bed nets, as long as they remain sick.



**Pan American  
Health  
Organization**



**World Health  
Organization**

REGIONAL OFFICE FOR THE **Americas**

- As additional measures, people can wear appropriate clothing that minimizes skin exposure (trousers and long-sleeved shirts) and install screens in doors and windows. They can also use repellents authorized for human use, such as those containing DEET (N, N-Diethyl-3-methylbenzamide), IR3535 (3-[N-acetyl-Nbutyl]-ester ethyl acid aminopropionic) or Icaridin (acid-1 piperidinecarboxylic, 2-(2 - hydroxyethyl) - 1-methylpropylester), which can be applied to exposed skin or clothes and should be used in strict accordance with the instructions on the product label. There is no evidence to suggest restricting the use of these repellents in pregnant women, provided that the instructions on the product label are followed.
- To date, despite all efforts, there is no vaccine against these diseases and no new strategies or technologies (transgenic mosquitoes, *Wolbachia*, lethal traps, new insecticides or larvicides, etc.) that have been fully evaluated and validated by sufficient evidence to be recommended by PAHO/WHO.

## References

1. Pan American Health Organization. Nelson Mj, 1986. *Aedes aegypti* Biology and Ecology. Washington, D.C: PAHO/WHO.
2. Pan American Health Organization. Estrada JG, Craig. Biology, 1995. Disease Relationships, and Control of *Aedes albopictus*. Washington, D.C: PAHO/WHO; (Technical paper No. 42).
3. Dengue - Guidelines for diagnosis, treatment, prevention and control. World Health Organization. WHO/HTM/NTD/DEN/2009.1
4. Koren G, Matsui D and Bailey B. DEET-based insect repellants: safety implications for children and pregnant and lactating women. Canadian Medical Association Journal 2003;169(3):209-12
5. United States Centers for Disease Control and Prevention (CDC). Insect Repellent Use & Safety. Available at: <http://www.cdc.gov/westnile/faq/repellent.html> (accessed 18 December 2015).
6. WHO. Pesticides and their application for the control of vectors and pests of public health importance. Geneva, World Health Organization, 2006.