Epidemiological Update
Increase in dengue cases in the Region of the Americas

18 June 2024

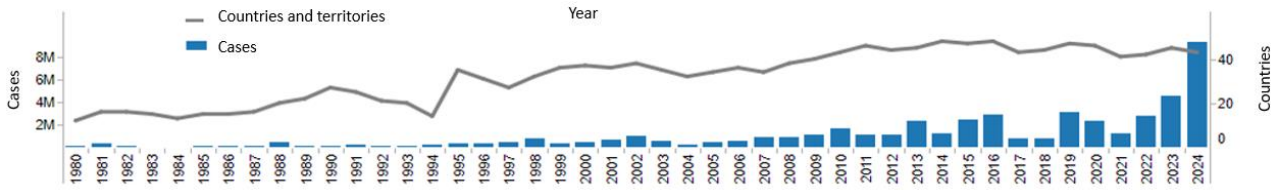
Summary of the situation in the Region

In the Region of the Americas, the number of dengue cases recorded during the first half of 2024 exceeded the maximum number of cases historically reported in a year, as compared to all previously recorded years. As of epidemiological week (EW) 23 of 2024, 43 countries and territories in the Region of the Americas have reported 9,386,082 cases of dengue; this number is twice as high as the number of cases recorded throughout 2023, 4,617,108 cases (**Figure 1**) *(1)*.

Between EW 1 and EW 23 of 2024, of the total reported cases, 4,630,669 (49%) were laboratory confirmed. Of this total, 9,582 were characterized as severe dengue (0.10%) and 4,529 fatal cases were recorded (fatality rate 0.048%) *(1)*. Cases from six countries make up 98% of the fatal cases in the Region of the Americas: Brazil with 3,643 (82.4%), Argentina with 355 (8.0%), Peru with 203 (4.5%), Paraguay with 100 (2.3%), Colombia with 74 (1.7%), and Ecuador with 44 (0.9%) fatal cases *(1)*.

All four serotypes of the dengue virus have been circulating in the Region of the Americas as of EW 23 of 2024. Brazil, Costa Rica, Guatemala, Honduras, Mexico and Panama report simultaneous circulation of the four serotypes (DENV-1, DENV-2, DENV -3 and DENV-4). Additionally, Argentina, Peru, and Puerto Rico reported simultaneous circulation of DENV-1, DENV-2, and DENV-3 *(1)*.

Figure 1. Total number of reported cases of dengue and number of countries and territories, 1980 – 2024 (up to EW 23) in the Region of the Americas.



Source: Adapted from the Pan American Health Organization. PLISA Health Information Platform for the Americas, Dengue Indicators Portal. Washington, D.C.: PAHO; 2024 [cited 13 June 2024]. Available from: https://www3.paho.org/data/index.php/en/mnu-topics/indicadores-dengue-en.html

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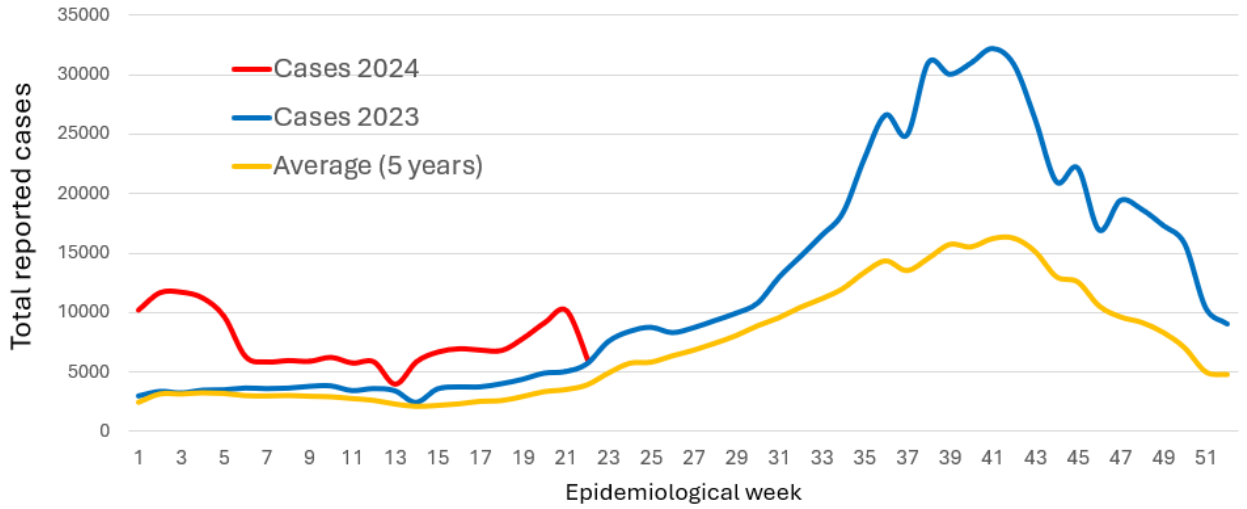
Summary of the situation by subregion[1]

Subregion of the Central American Isthmus and Mexico

Between EW 1 and EW 23 of 2024, 174,868 cases of dengue were reported, representing a 92% increase as compared to the same period in 2023 and 155% compared to the last 5-year average (**Figure 2**) *(1)*.

Figure 2. Dengue cases in 2023 - 2024 (up to EW 22) and the last 5-year average. Central American Isthmus and Mexico.



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The situation of select countries, arranged in alphabetical order, is provided below:

In **Guatemala,** up to EW 23 of 2024, 27,951 cases of dengue were reported, which represents an increase of 516% as compared to the same period in 2023 and 734% compared to the last 5-year average. The cumulative incidence rate as of EW 23 of 2024 is 153 cases per 100,000 population, 20 cases (0.07%) were characterized as severe and 10 fatal cases were recorded (case fatality rate 0.036%) (**Figure 3**) *(1)*.

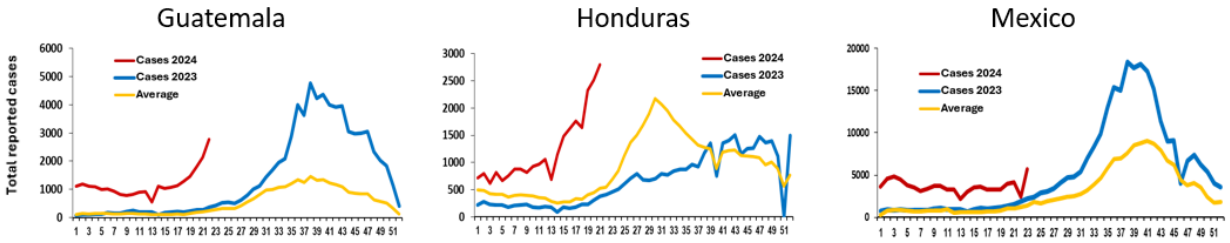
In **Honduras,** up to EW 21 of 2024, 25,859 cases of dengue were reported, representing an increase of 436% compared to the same period in 2023 and 199% compared to the last 5-year average. The cumulative incidence rate as of EW 21, 2024 is 257 cases per 100,000 population, 336 cases (1.29%) were characterized as severe and 20 fatal cases were recorded (case fatality rate 0.077%) (**Figure 3**) *(1)*.

In **Mexico**, up to EW 23 of 2024, 83,997 cases of dengue were reported, which represents an increase of 241% as compared to the same period in 2023 and 357% compared to the last 5-year average. The states that reported the majority of cases were Guerrero, Tabasco, and

[1] Note: Subregions and corresponding countries and territories follow the divisions described in PLISA Health Information Platform for the Americas, Dengue Portal. Washington, DC: PAHO; 2024 [cited 13 June 2024]. Available from: https://www3.paho.org/data/index.php/en/mnu-topics/indicadores-dengue-en.html

Quintana Roo. The cumulative incidence rate as of EW 23 of 2024 is 63 cases per 100,000 population, 510 cases (0.61%) were characterized as severe and 26 fatal cases were recorded (case fatality rate 0.031%) (**Figure 3**) *(1)*.

Figura 3. Dengue cases from 2023 – 2024 and the last 5-year average. Guatemala and Mexico (up to EW 23) and Honduras (up to EW 21).



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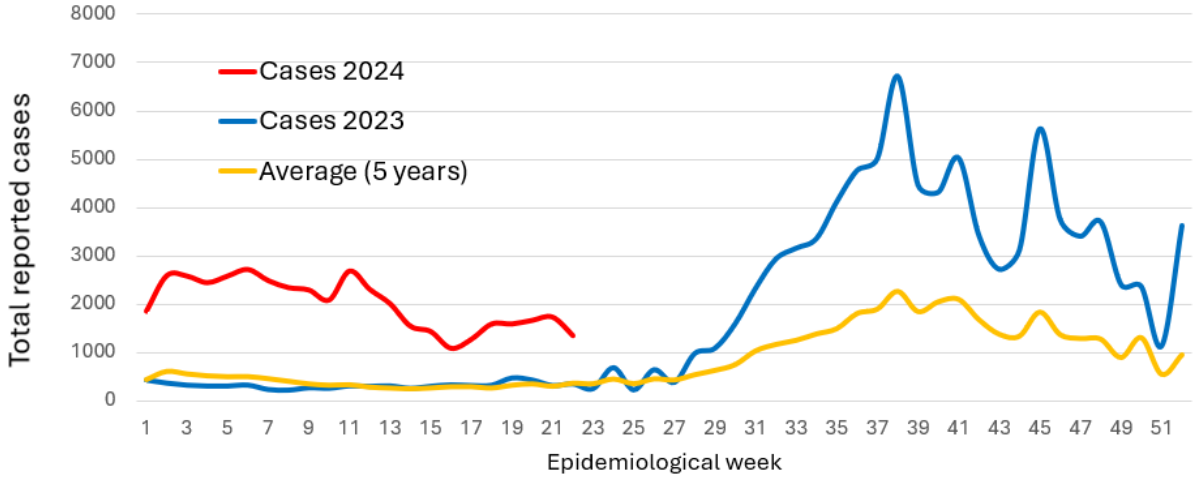
Carribean Subregion

Between EW 1 and EW 23 of 2024, 56,024 suspected cases of dengue were reported. The Carribean subregion registered an increase of 469% as compared to the same period in 2023 and 552% compared to the last 5-year average in the subregion (**Figure 4**) *(1)*.

In the **Dominican Republic,** up to EW 23 of 2024, 8,790 suspected dengue cases were reported, which represents an increase of 442% compared to the same period in 2023 and 320% compared to the last 5-year average. The cumulative incidence rate as of EW 23 of 2024 is 80 cases per 100,000 population. Additionally, 60 cases (0.68%) were characterized as severe, and no fatal cases were reported.

Figure 4. Dengue cases in 2023 - 2024 (until EW 22) and the last 5-year average. Caribbean subregion.



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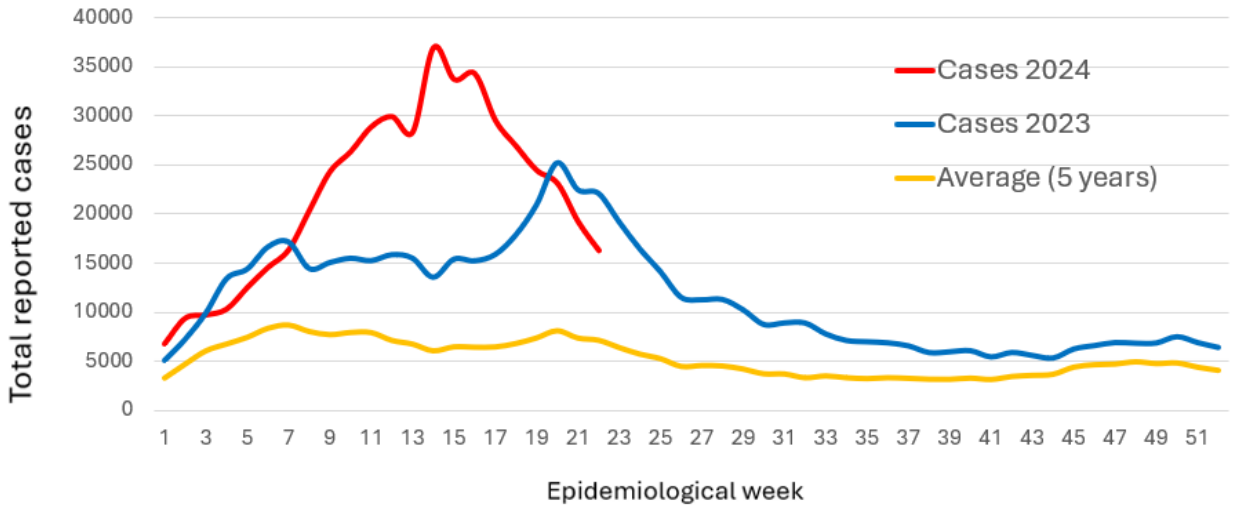
Andean Subregion

Between EW 1 and EW 23 of 2024, 497,741 suspected cases of dengue were reported. The Andean subregion reported an increase of 37% compared to the same period in 2023 and an increase of 211% compared to the last 5-year average (**Figure 5**) *(1)*.

Figure 5. Dengue cases in 2023 - 2024 (until SE 22) and the last 5-year average. Andean subregion.



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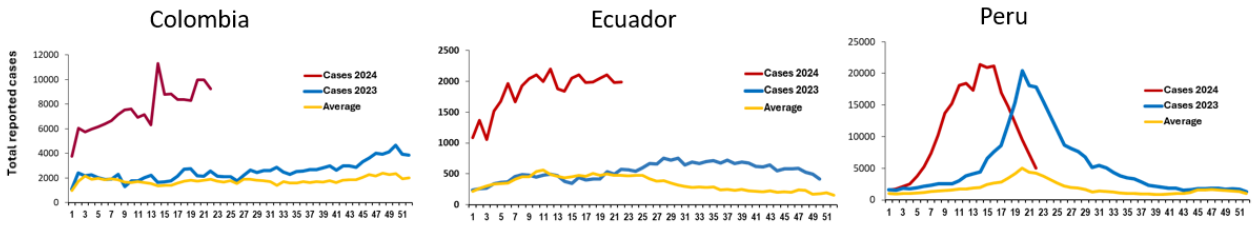
The situation of select countries, arranged in alphabetical order, is provided below:

Colombia reported 175,962 cases between EW 1 and EW 23 of 2024, representing an increase of 352% compared to the last 5-year average for the same period in the country. The cumulative incidence rate as of EW 23 is 343 cases per 100,000 population, 1,592 cases (0.90%) were characterized as severe and 81 fatal cases were recorded (case fatality rate 0.046%) (**Figure 6**) *(1)*.

Ecuador reported 35,189 cases between EW 1 and EW 22 of 2024, representing an increase of 273% compared to the last 5-year average for the same period in the country. The cumulative incidence rate as of EW 22 of 2024 is 197 cases per 100,000 population, 167 cases (0.47%) were characterized as severe and 44 fatal cases were recorded (case fatality rate 0.125%) (**Figure 6**) *(1)*.

Perú reported 249,843 cases between EW 1 and EW 23 of 2024, which represents an increase of 376% compared to the last 5-year average for the same period in the country. The cumulative incidence rate as of EW 23 of 2024 is 749 cases per 100,000 population, 671 cases (0.27%) were characterized as severe and 207 fatal cases were recorded (case fatality rate 0.083%) (**Figure 6**) *(1)*.

Figure 6. Dengue cases in 2023 – 2024 (until EW 22) and the last 5-year average. Colombia, Ecuador, and Peru.



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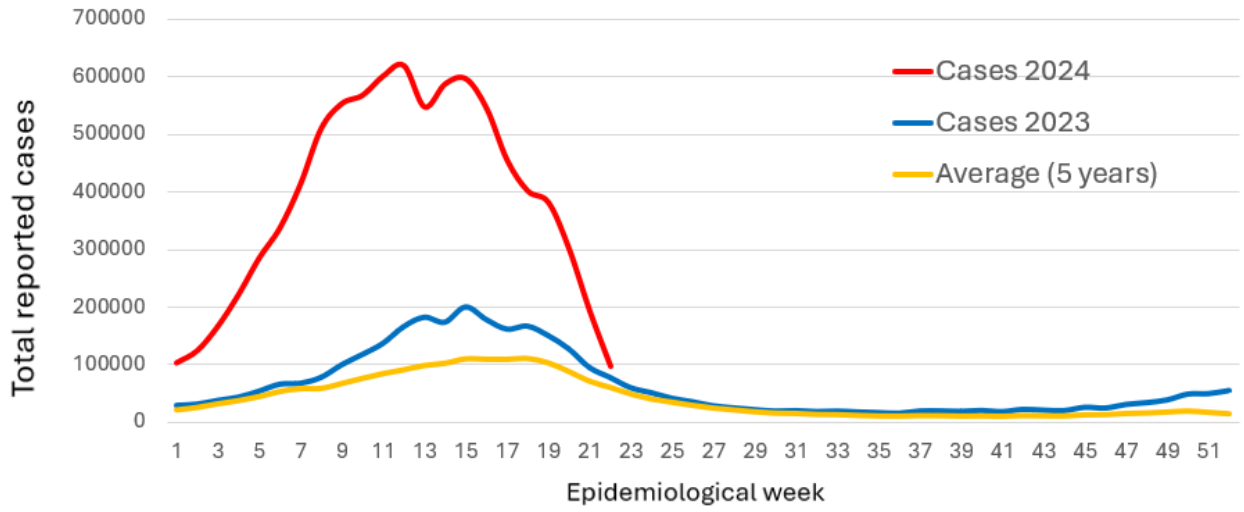
Southern Cone Subregion

Between EW 1 and EW 23 of 2024, 8,656,706 suspected cases of dengue were reported in the Southern Cone Subregion. This represents an increase of 244% compared to the same period in 2023 and 422% compared to the last 5-year average in the subregion (**Figure 7**).

The situation of select countries, arranged in alphabetical order, is provided below:

Figure 7. Dengue cases in 2023 - 2024 (until EW 22) and the last 5-year average. Southern Cone Subregion.



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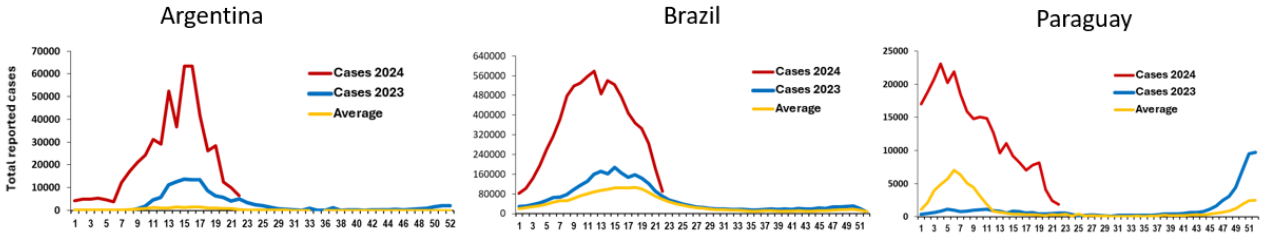
In **Argentina**, the number of cases reported in the first 22 epidemiological weeks of 2024 was 504,580. This represents an increase of more than 1,387% compared to the last 5-year average for the same period in the country. The cumulative incidence rate as of EW 22 of 2024 is 1,106 cases per 100,000 population, 722 cases (0.14%) were characterized as severe and 722 fatal cases were recorded (case fatality rate 0.070%) (**Figure 8**) *(1)*.

In **Brazil,** the number of cases reported in the first 23 epidemiological weeks of 2024 was 7,866,769, representing an increase of 230% compared to the same period in 2023. The cumulative incidence rate as of EW 23 is 3,676 cases per 100,000 population, 5,210 cases (0.07%) were characterized as severe and 3,643 fatal cases were recorded (case fatality rate 0.046%) (**Figure 8**) *(1)*.

In **Paraguay**, the number of cases reported in the first 23 epidemiological weeks of 2024 was 284,502, which represents an increase of 461% compared to the last 5-year average for the same period in the country. The cumulative incidence rate as of EW 23 of 2024 is 3,766 cases per 100,000 population, 100 fatal cases were recorded (case fatality rate 0.035%) (**Figure 8**) *(1)*.

Figure 8. Dengue cases in 2023 – 2024 and last 5-year average. Argentina (2024 until EW 22), Brazil and Paraguay (2024 until EW 23).



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Guidance for national authorities

PAHO/WHO reiterates to Member States to continue strengthening surveillance, triage, diagnosis, timely and adequate management of cases of dengue and other arboviruses, and vector control actions.

Integrated Surveillance

PAHO/WHO encourages continued epidemiological surveillance and reporting of suspected and confirmed cases of dengue, chikungunya, and Zika.

Since clustering of cases is common in these diseases (dengue, chikungunya, and Zika), efforts should be made to analyze the spatial distribution of cases to enable a rapid response at the local level in the most affected areas. Information from the hotspots of the three diseases should be targeted for intensive vector control.

Sentinel entomological surveillance will help assess changes in vector-borne disease risk and the impact of vector control measures.

Case management

Measures to ensure proper clinical management of suspected cases of dengue should be a priority.

Capacity building at the primary health care level is needed to prevent progression to severe forms of dengue and dengue deaths. To this end, health care workers should make an early clinical diagnosis and recognize the warning signs of dengue (such as intense and sustained abdominal pain or pain on palpation of the abdomen, persistent vomiting, clinical fluid accumulation, mucosal bleeding, lethargy, restlessness, liver enlargement > 2 cm below the costal margin and progressive increase in hematocrit) in order to initiate appropriate management according to the recommendations published in PAHO clinical guidelines. In cases where dengue is suspected, health care workers should provide clear guidance to patients and/or families to monitor for warning signs and seek immediate medical attention if at least one of these signs is present. These measures will also help reduce the number of patients who need to be referred to hospitals, thus avoiding overcrowding of these facilities and intensive care units.

At the same time, all second and third level hospitals should be prepared to handle dengue cases with warning signs and severe dengue cases.

It is important that prior to the season of increased transmission of dengue (and other arbovirosis), health personnel in charge of the clinical care of these cases be properly trained. PAHO has a virtual course on dengue for this purpose, available free of charge on its Virtual Public Health Campus (2). More information on the clinical management of dengue cases is available in the Guidelines for the clinical diagnosis and treatment of dengue, chikungunya and Zika *(3)* and in the Tool for the diagnosis and care of patients with suspected arbovirosis *(4)*, both published by PAHO.

PAHO reiterates the recommendations for technical teams in charge of malaria control, which also apply to personnel involved in arbovirosis care, available at: https://iris.paho.org/handle/10665.2/52079 *(5)*.

Adequacy of health care services

In view of the current increase in the incidence of dengue in the Region, Member States are urged to adapt their health services to provide a timely and correct response to the population at all levels of care.

- Organize screening, patient flow and clinical surveillance and hospitalization areas in each institution, at different levels of care.
- Reorganize health services in outbreak/epidemic situations at different levels of patient care to avoid overcrowding of hospitals.
- Strengthening of patient care networks for clinical diagnosis, management, follow-up, as well as referral and counter-referral of patients with suspected dengue, chikungunya or Zika.

Laboratory confirmation

It is important to keep in mind that the initial diagnosis of dengue virus (DENV) infection is clinical, and adequate suspicion can guide the confirmation protocol. Laboratory results should be analyzed with clinical information and according to epidemiological context, for surveillance purposes and not for clinical decision making.

Laboratory confirmation of dengue infection is based on virological (RT-PCR, detection of NS1 antigen by ELISA, and in some cases viral isolation in culture for further characterization) and serological (IgM detection) tests. However, virological assays that demonstrate the presence of the whole virus, its genetic material or its proteins should be prioritized for case confirmation. Virological assays for dengue are performed on serum samples taken during the first 5 days after the onset of symptoms (acute phase) (**Figure 9**) *(6)*.

On the other hand, serological assays based on IgM detection should be analyzed with care, taking into account the time that antibodies circulate in the blood after infection, as well as the possibility of cross-reactivity with other flaviviruses (including Zika, yellow fever and others) and nonspecific detection. Thus, a single IgM result in a patient indicates only one contact with the virus, and these cases are defined as a probable case of dengue. A second sample taken at least one week apart, processed in parallel with the first and with a quantitative serological assay (PRNT, for example) that allows to demonstrate seroconversion or increase in antibody titer, can be useful to clarify the diagnosis (**Figure 10**) *(6)*.

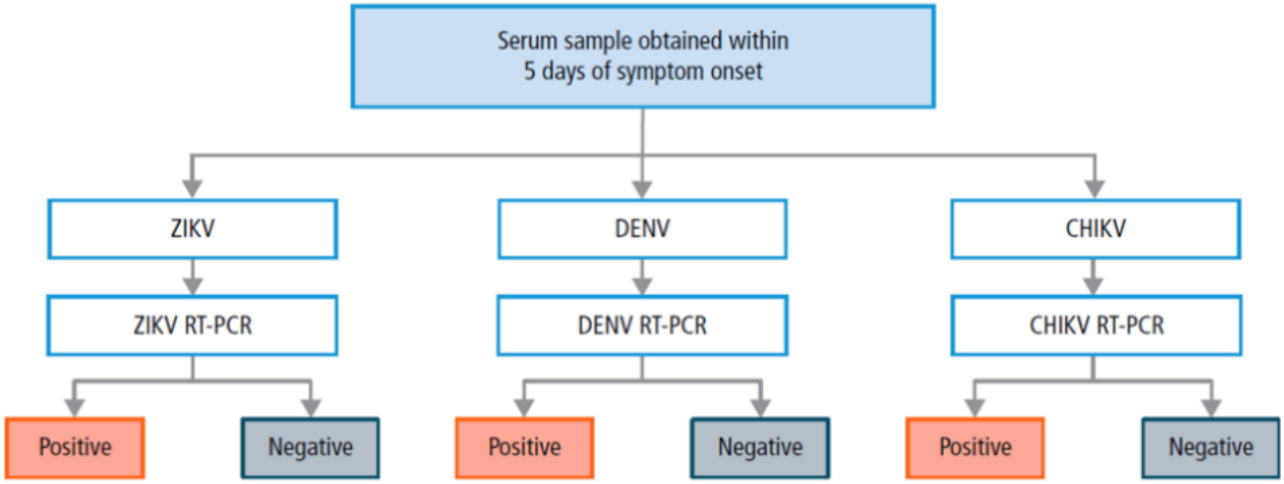
It is important to have a clear laboratory algorithm for early detection. Although multiple molecular methodologies (*multiplex* PCR) are useful when there is no clear clinical suspicion, when a case of dengue meets the established definitions and where the clinical picture is compatible, it is suggested to prioritize protocols for specific detection (*singleplex*) of the virus *(6)*.

In fatal cases, tissue samples (liver, spleen, kidney) should be considered both for detection of genetic material (RT-PCR) and for histopathological and immunohistochemical studies. Taking biopsies in a patient with suspected dengue is completely contraindicated.

On the other hand, the use of immunochromatographic tests, also known as rapid tests (NS1 and/or antibodies) is not recommended since, due to their low sensitivity, false negative results may be obtained; their use should be limited to community studies under established protocols, but in no case to rule out infection or to implement medical behaviors.

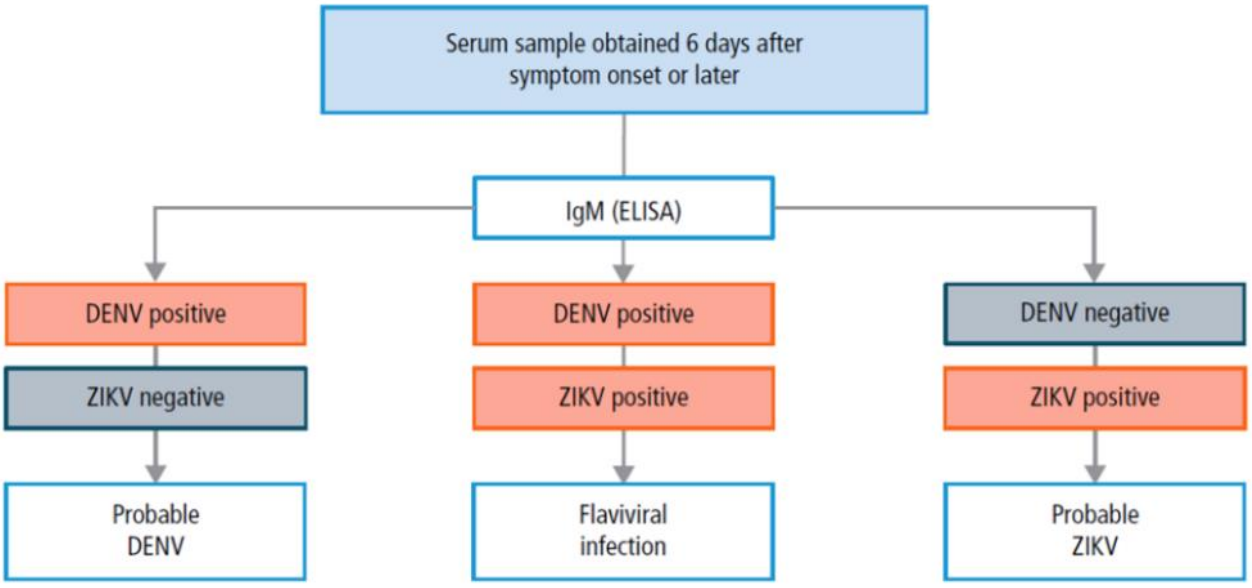
Since laboratory services are a key component of dengue epidemiological and virological surveillance, timely detection and characterization in appropriate samples should be maintained. To the extent possible and according to the capabilities of each laboratory, it is recommended that 100% of severe and fatal dengue cases be sampled, while only a proportion of those cases without alarm signs will be necessary for surveillance (10-30% or a maximum number of samples according to the installed capacity).

Figure 9. Algorithm for virological testing in suspected cases of dengue, chikungunya and Zika.



Source: Pan American Health Organization. Recommendations for the detection and laboratory diagnosis of arbovirus infections in the Region of the Americas. Washington, D.C., PAHO; 2022. Available from: https://iris.paho.org/handle/10665.2/57555

Figure 10. Algorithm for serological testing in suspected cases of dengue and Zika.



Source: Pan American Health Organization. Recommendations for the detection and laboratory diagnosis of arbovirus infections in the Region of the Americas. Washington, D.C., PAHO; 2022. Available from: https://iris.paho.org/handle/10665.2/57555

Aedes prevention and control measures

PAHO/WHO urges Member States to make effective use of available resources to prevent and/or control vector infestations in affected areas and health services. This will be achieved through the implementation of integrated vector control strategies, which include the following processes:

- Selection of control methods based on knowledge of vector biology, disease transmission and morbidity.
- Use of multiple interventions, often in combination and synergistically.
- Collaboration of the health sector with public and private sectors linked to environmental management whose work has an impact on vector reduction.
- Integration of individuals, families and other key partners (education, finance, tourism, water and sanitation and others) into prevention and control activities.
- Strengthening of the legal framework to enable an integrated and intersectoral approach.

Given the high infestation of *Aedes aegypti* and the presence of *Ae. albopictus* in the Region, it is recommended that prevention and control measures be aimed at reducing the density of the vector and that they be accepted and collaborated with by the local population. Prevention and control measures to be implemented by national and/or local authorities should include the following:

- Strengthen environmental management actions, mainly the elimination of vector breeding sites in homes and common areas (parks, schools, cemeteries, etc.).
- Reorganize solid waste collection services to support the elimination of breeding sites prioritizing areas of high transmission and, if necessary, plan intensive actions in specific areas where regular garbage collection has been interrupted.
- Apply measures for the control *(7)* of breeding sites through the use of physical, biological and/or chemical methods that actively involve individuals, the family and the community.
- Define areas at high risk of transmission (risk stratification) *(8) and* prioritize those where there are concentrations of people (schools, terminals, hospitals, health centers, etc.). In these facilities, the presence of the mosquito should be eliminated within a diameter of at least 400 meters. It is important to pay special attention to health units, so that they are free of the presence of the vector and its breeding sites and do not become virus radiating points.
- In areas where active transmission is detected, it is suggested to implement measures aimed at eliminating infected adult mosquitoes (mainly through the use of insecticides) in order to stop and interrupt transmission. This action is exceptional in nature and is only effective when carried out by properly trained personnel under internationally accepted technical guidelines; and when performed concomitantly with the other proposed actions. The main action to interrupt transmission when it occurs intensively is the elimination of adult mosquitoes infected with the Dengue virus (active transmission) by intradomiciliary spraying, using individual equipment or spatial spraying using heavy equipment mounted on vehicles, in addition to the destruction and/or control of vector breeding sites inside homes and their surroundings *(9)*.

- An effective adult control modality that can be used, considering the available operational capacities, is indoor residual spraying, which should be applied selectively to the resting places of *Ae. aegypti,* taking care not to contaminate food, drinking water storage containers or those used for cooking. This intervention in treated areas is effective for up to four months and can be used in shelters, homes, health services, schools and others. For more information, consult PAHO's Manual for Indoor Household Residual Spraying for *Aedes aegypti* Control in Urban Areas *(10)* and the document Control *of Ae. aegypti* in the COVID-19 Simultaneous Transmission Scenario *(11)*.
- Adequate choice of the insecticide to be used (following PAHO/WHO recommendations), its formulation and knowledge of the susceptibility of *Aedes* populations to the insecticide *(12)*.
- Ensure the proper functioning of spraying equipment and its maintenance and ensure insecticide reserves.
- Intensify supervision actions (quality control and coverage) of operators' field work, both for intradomiciliary spraying actions with individual equipment, as well as for space spraying tasks with heavy equipment mounted on vehicles, ensuring compliance with personal protection measures.

Personal preventive measures

Patients infected with dengue, chikungunya and/or Zika viruses are the reservoir of infection for others in their homes and in the community. It is necessary to communicate to patients, their families and the affected community about the risk of transmission and ways to prevent transmission by reducing the vector population and vector-human contact.

To minimize vector-patient contact it is recommended:

- The patient should rest under mosquito nets, whether or not impregnated with insecticide.
- Sick people, as well as other members of the household, should wear long sleeves to cover the extremities.
- Repellents containing DEET, IR3535 or Icaridin may be applied to exposed skin or clothing, and their use must be in strict accordance with product label instructions.
- Use mosquito netting/netting on doors and windows.

Communication and community participation

It is recommended to establish and implement a rapid communication action plan focused on:

- Measures to prevent the formation of vector breeding sites and their elimination to avoid transmission, and
- Information on symptoms and warning signs of dengue when the epidemiological situation of the country so requires, for example, in the event of an increase in the number of cases or deaths due to dengue.

It is recommended to consider as main audiences: individuals, communities, neighborhood committees, municipalities, public and private sectors: messages on measures to prevent the formation of vector breeding sites and their elimination to avoid arbovirus transmission.

Hearings:

- Individuals, communities, neighborhood committees, municipalities, public and private sectors: messages on measures to prevent the formation of vector breeding sites and their elimination to avoid the transmission of dengue and other arboviruses. In addition, information on the warning signs of dengue to seek immediate medical attention.
- Health workers (including nurses, physicians, primary care and hospital staff) and vector control program technicians: information on symptoms and warning signs of dengue that are present or increasing in the country.

Every effort should be made to obtain community support for dengue prevention and control.

Simple Information, Education and Communication (IEC) materials can be disseminated through various media (including social networks or closed-circuit television (CCTV) in primary health care facilities).

The population and household members should be encouraged to eliminate sources of mosquito breeding, both household and peri-household. This is everyone's task: the family, the community, the public and private sector.

Highly productive mosquito breeding sites such as water storage containers (drums, elevated tanks, clay pots, etc.) should be targeted for prevention of vector breeding. Other breeding sites, such as roof gutters and other water retention containers, should also be cleaned periodically.

Both health care personnel and affected communities should be encouraged to know the symptoms of dengue, as well as its warning signs and how to act in the event of such manifestations.

Working with local teams is encouraged, as they know how to make this information more effective, and in many cases national campaigns and messages are not as effective as local initiatives *(7)*.

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Additional resources

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