



Epidemiological Alert

Chikungunya and dengue fever in the Americas

29 August 2014

Given the continued spread of chikungunya virus in the Americas, and the start of the period with higher dengue circulation in Central America and the Caribbean, the Pan American Health Organization / World Health Organization (PAHO / WHO) advises Member States who have the vector mosquito of both viruses (*Aedes aegypti*), to increase vector density reduction efforts, based on the Dengue Integrated Management Strategy (Dengue-IMS), in addition to establishing and maintaining dengue and chikungunya case management capacity, and to implement effective public communication strategies to eliminate mosquito breeding sites.

Situation summary

The first evidence of autochthonous chikungunya transmission in the Americas was recorded in December 2013, since then, autochthonous transmission has been detected in 33 countries and territories of the Americas (27 countries and territories in the Caribbean, 3 countries in Central America, 1 country and 1 territory in South America and 1 country in North America).^{1,2} As of epidemiological week (EW) 35 of 2014, the Pan American Health Organization / World Health Organization (PAHO/WHO) has been informed of a total of 659,367 cases, including 37 deaths, in the Americas.

Usually during the second semester of the year, Central America, Mexico and the Caribbean experience a seasonal increase in dengue fever transmission. Currently, the Dominican Republic, El Salvador, Guatemala, and Honduras, are recording increases in cases coinciding with this period of greater transmission.

The threats posed by the seasonal increase of dengue transmission and the introduction, or risks of introduction of the chikungunya virus in the Region require an integrated approach of prevention and vector control activities of both diseases. With the rapid spread of the chikungunya virus observed in some countries of the Americas, simultaneous dengue and chikungunya outbreaks may occur, which would result in increased health care demand. Accordingly, health care services must be prepared to meet expected increased demand without compromising quality of care; preparations should be guided by the PAHO/WHO recommendations for clinical management of patients with dengue or chikungunya.

¹ Anguilla, Antigua and Barbuda, Aruba, the Bahamas, Barbados, the British Virgin Islands, Curacao, the Cayman Islands, Costa Rica, Dominica, the Dominican Republic, El Salvador, French Guiana, Granada, Guadeloupe, Guyana, Haiti, Jamaica, Martinique, Panama, Puerto Rico, Saint Barthelemy, Saint Kitts and Nevis, Saint Lucia, Saint Martin (French), Saint Vincent and the Grenadines, Sint Maarten (Dutch), Suriname, Trinidad and Tobago, Turks and Caicos, the United States of America, the US Virgin Islands, and Venezuela .

² An updated table of the distribution of recorded chikungunya cases is posted weekly on the PAHO/WHO chikungunya website available at: <http://www.paho.org/chikungunya>

To optimize available resources, activities should be stratified based on risk of transmission. Recommendations on key technical components to take into account for surveillance and response include the following:

Guidance for national authorities

Since 2003³, countries of the Region of the Americas have been implementing the Dengue Integrated Management Strategy (Dengue-IMS) for dengue prevention and control. This strategy and its components lead to a strengthened integrated institutional response through a multi and inter-sectorial approach, operationalized by, the Dengue Task Force (GT-Dengue, from its acronym in Spanish). The Dengue-IMS includes six areas of work: epidemiology, laboratory, patient care, social communication, environment and integrated vector management.

PAHO/WHO advises countries to continue strengthening the six areas of work to respond to dengue and chikungunya, while preserving the technical specificities of each disease in the components of patient care and epidemiology.

Epidemiology

The epidemiological surveillance is a key element of this component and should be adapted to the epidemiological situation of each country given that, different scenarios may occur. In order to direct actions and optimize the use of resources, each country must pre-define and analyze the different possible scenarios and implement corresponding surveillance activities.

Following are three possible scenarios:

Scenario I: *Current dengue transmission with no evidence of chikungunya transmission:*

- Surveillance of febrile or dengue fever patients should continue in accordance to national guidelines or protocols. In such a scenario, chikungunya surveillance is primarily aimed at detecting autochthonous transmission. The surveillance should be oriented to enable the detection of clinically compatible cases of chikungunya⁴ (negative for dengue). A fraction of this cluster (or the entire cluster, depending on resources available) should be tested to confirm the presence of chikungunya.⁵

Scenario II: *Evidence of chikungunya transmission and current dengue transmission:*

Surveillance should be focused on gathering information to describe each disease, in other words:

³ During the 44th PAHO/WHO Directing Council, adopted [Resolution CD44.R9](#), in which the new strategy of integrated management for the dengue prevention and control was introduced.

⁴ Suspected cases: patients with fever >38.5°C (101.3°F) and severe arthralgia or acute onset of arthritis not explained by other medical conditions and who resides or has visited epidemic or endemic areas during the two weeks preceding the onset of symptoms.

⁵ See page 6 of the Preparedness and Response for Chikungunya Virus Introduction in the Americas. Available at http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=index.php?option=com_docman&task=doc_download&gid=26869&Itemid=

For dengue:

- Organize and present epidemiological data based on the three epidemiological variables (time, place and persons), trends, proportion of severe cases, case fatality rate, and circulating serotypes.

For chikungunya:

- Trend, geographic distribution of the virus, clinical presentation, impact on society (e.g. days missed from work, school closures, etc.), identify risk factors for infection or severe disease, identifying circulating chikungunya virus lineages. Surveillance through sentinel sites is proposed for this purpose.

Scenario III: Concomitant chikungunya and dengue outbreaks:

Surveillance should be oriented to identify the epidemiological and ecological changes in transmission of both viruses and to monitor the clinical presentation of infected patients with the objective of implementing actions to minimize severe cases and deaths caused by dengue. The following is proposed:

For dengue:

- Surveillance of clinical cases with warning signs and monitor circulating serotypes.⁶

For chikungunya, according to the resources available in the country:

- Monitor the disease trend and geographic distribution of the virus through surveillance of clinically compatible cases (in areas where the transmission of the virus has been confirmed) and identify new areas of transmission through surveillance of clinically compatible chikungunya cases/clusters.
- Depending on resources available, the following should also be monitored: the different types of clinical presentation, impact on society (e.g. days missed from work, school closures, etc.), identify risk factors for infection or severe disease, and circulating chikungunya virus lineages. Surveillance through sentinel sites is advised for this purpose.

Special attention must be given in the clinical management and evolution of patients co-infected with both viruses.

Patient care

The clinical case management component of the EGI-Dengue aims to prevent severe cases and deaths; accordingly, this component must be designed to ensure early detection, identification of warning signs and appropriate and timely treatment of cases, regardless of the suspected disease (dengue or chikungunya). Considering the clinical differences of both illnesses, it is recommended that all patients, children in particular, be managed as a dengue case until confirmed by laboratory diagnostic, or unless the clinical picture is very indicative of chikungunya infection.

⁶ As recommended by the EGI-Dengue

Patients and families should be educated to identify the illnesses and warning signs, and to seek assistance from the nearest health care services accordingly.

In addition, health personnel handling cases at both the primary care and other levels of care should be continuously trained.

Patient referral and health care services organization

Health care networks must be organized to take into consideration the possibility of expanding services in case of an increase of cases. In addition, health services should be organized to immediately refer for hospitalization those patients with warning signs of dengue, requiring specialized medical attention, or with the presence of illness, or of concomitant conditions or persons whose social situation impede access to necessary care (for example: persons living in remote areas, refugees, displaced persons, etc.).

With regards to patient management in the context of simultaneous circulation of dengue and chikungunya, adapting and revising the patient care component, within the Dengue-IMS framework, with the following:

- Both diseases should initially be evaluated and managed at the primary care level. Appropriate management at this level will ensure that the hospital level is reserved for patients with warning signs of dengue and severe dengue, and for atypical or severe cases of chikungunya which are unusual.
- The screening/triage at clinical, medical attention centers, emergency rooms and medical practices, is key to prioritizing patients who need the most attention. In scenarios of simultaneous transmission of both diseases, clinical management should be oriented to identify dengue warning signs, which are not present in chikungunya. The presence of warning signs indicates the need for strict patient monitoring and specialized attention, both, are critical to saving lives in the case of dengue.
- At secondary care levels (usually hospitals), where medical care for dengue and chikungunya are sought, it is important to organize the provision of health services, to ensure that patients with warning signs of dengue are cared for in specific wards that include intensive monitoring⁷. This is a key element for timely treatment and to prevent evolving to a severe case or death.

It is not necessary to wait for or to have the laboratory results of dengue or chikungunya to start the clinical management and treatment of patients suspected of either of these diseases. The initial clinical diagnosis is sufficient to provide timely and quality treatment and medical care.

Integrated Vector Management (IVM)

An effective and operational dengue vector control program provides the basis for adequate preparation against chikungunya, because both viruses are transmitted by the same mosquito, *Ae. Aegypti*. Therefore, to respond to the introduction of the chikungunya virus,

⁷ Hospital wards have a routine for the monitoring of vital signs. In practice, it is frequently observed that deterioration of dengue patients that are monitored with the same routine are not detected in a timely manner. To avoid this, hospitalization of patients with warning signs in designated rooms for enhanced and continuous monitoring of signs and symptoms is recommended.

continuing to intensify surveillance and vector control developed as part of Dengue-IMS is recommended.

To ensure a successful integrated vector management (IVM) component for dengue and chikungunya it is key to include intersectoral participation and collaboration at all levels of government, including the health, education, environment, social, development and tourism sectors. In IVM programs non-governmental organizations (NGOs) and private organizations should be also integrated while maintaining communication channels and mobilizing community participation. Providing clear and quality information to the public about both diseases via communication campaigns is important.

Given the broad distribution of *Ae. aegypti* and *Ae. albopictus* in the Americas, prevention and control measures should be aimed at reducing vector density, and obtaining the acceptance and collaboration of communities in adopting such measures.

Prevention and control measures by national authorities should include the following:

- Strengthen environmental management in order to prevent or minimize vector propagation and human contact with the vector-mosquito by eliminating vector breeding sites in each household and in common areas of districts and cities (e.g. parks, schools, cemeteries, etc.).
- Organize mass communication campaigns for the elimination of breeding sites in specific areas where routine garbage collection has been interrupted.
- Implement breeding site control measures through the use of physical, biological and chemical methods, while actively involving communities.
- Identify high risk of transmission areas (risk stratification) and prioritize those where there are concentrations of people (e.g.: schools, transportation terminals, hospitals, health centers, etc.). The presence of mosquitoes should be removed at a diameter of at least 400 meter radius around these facilities.
- In areas where an autochthonous or imported case of chikungunya transmission is detected, adulticide treatment (primarily through spraying) could be used to remove infected adult mosquitoes in order to interrupt transmission. It is important to take into account that this action is exceptional and is only effective when executed by adequately trained personnel following internationally accepted technical guidelines and when performed concomitantly to other proposed actions (as described above). Spraying is the primary manner to intensively interrupt transmission and obtain time to consolidate the removal of larval habitats.
- Select appropriate insecticide (in accordance with PAHO/WHO recommendations), verify the product label and formula, and consider the susceptibility of mosquito populations to that insecticide.
- Maintain and use spraying equipment in an appropriate manner and maintain a stockpile of insecticides.
- Ensure intensified monitoring (e.g. quality control) of fieldwork operators both during larval control and during adulticide treatment.

Integrated (simultaneous or coordinated) actions for vector control, in space and time, (e.g. adulticide and larval control by trained personnel, coupled with sanitation and the promotion of community actions) is essential to achieving the greatest impact in the shortest amount of time.

Personal prevention measures

Patients infected with the dengue or chikungunya virus can be the reservoirs of infection for others in their household or in the community. Therefore, public health measures to minimize mosquito exposure are imperative to prevent an outbreak.

Patients and their household members must be educated about the risk of transmission to others and the ways to minimize this risk by reducing vector population and human-vector contact.

The following actions are recommended to minimize vector-patient contact:

Rest under mosquito net (bed-nets), impregnated with or without insecticide.

- Wear full sleeves to cover extremities; this applies to both the patient and other household members.
- Apply repellents containing DEET, IR3535 or Icaridina to exposed skin or clothing; its use must be strictly in accordance to the instructions indicated on the product label.
- Use of wire-mesh/ nets on doors and windows.

These personal prevention measures are also effective in preventing transmission of the virus to healthy people.

Travelers

Prior to departure

Health authorities should advise travelers heading to any country with documented circulation of dengue and/or chikungunya to take the necessary steps to protect themselves from mosquito bites, such as through the use of repellents, appropriate clothes that minimize skin exposure, and use of insecticides or nets. It is also important to inform travelers of the symptoms of dengue or chikungunya fevers in order to permit them to identify it promptly during their trip. The advice could be relayed through travel medicine services or clinics, dedicated travel health web pages of the Ministry of Health or other relevant Governmental web pages, among others.

While visiting places with dengue and/or chikungunya transmission

Advise travelers to:

- Take appropriate measures to protect themselves from mosquito bites through use of repellents or use of appropriate clothes that minimize skin exposure.
- Avoid mosquito-infested areas.
- Use nets and/or insecticide.

- Recognize symptoms of dengue and/or chikungunya and seek professional health care if any of these symptoms occur.

Upon returning

- Advise travelers returning home, that if they suspect they have dengue or chikungunya, they should contact their health care provider.

Clinicians and health care providers

- While continuing to remind clinicians to always ask patients for their travel history, to also remind them that, if a returning traveler seeks medical assistance and is suspected to have dengue or chikungunya, they should contact the appropriate public health authorities, in accordance to national protocols.
- To take the opportunity to sensitize health personnel in the private sector to the need for notification of any dengue or chikungunya cases, to allow for a timely response by the national public health services.

These guidelines for travelers can be disseminated through:

- Medical services or travel clinics, and via warning panels at airports, ports, train stations and bus terminals and to airlines operating in the country.
- Travel agencies and other tourism-related entities; in addition, diplomatic channels, postal services and others should be considered so that travelers may be informed about steps to take before, during, and after their trip.

Related Links

Chikungunya

1. Preparedness and Response for Chikungunya Virus – Introduction in the Americas. PAHO/WHO and US Centers for Disease Control and Prevention, 2011. Available at: http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=16984&Itemid=
2. Chikungunya - PAHO/WHO Health Topics. Available at: <http://www.paho.org/chikungunya>
3. Chikungunya – WHO Fact sheet No. 327, March 2008. Available at: <http://www.who.int/mediacentre/factsheets/fs327/en/>
4. PAHO/WHO Diagnostic algorithm: http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=23978&Itemid=270&lang=en
5. PAHO/WHO Aide Memoire for the clinical management of cases: http://www.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=23974&Itemid=270&lang=en

Dengue

1. Dengue, Patient care guide in the Region of the Americas (in Spanish). PAHO/WHO. 2010: http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=11239&Itemid=
2. Dengue, Diagnostic, treatment, prevention and control guide (in Spanish). PAHO/WHO. 2009: <http://www1.paho.org/hq/dmdocuments/2011/ndeng31570.pdf>

References

1. Dominican Republic. Special epidemiological bulletin No.5 on chikungunya in the Dominican Republic. Available at: <http://www.digepisalud.gob.do/>
2. Haiti Ministry of Public Health and Population. Epidémie de Chikungunya : les partenaires du MSPP se positionnent. Available at: <http://www.mspp.gouv.ht/site/downloads/table%20sectorielle%20sante%20Chikungunya%20juin%202014%202.pdf>
3. Institut de Veille Sanitaire. Bulletin hebdomadaire international du 4 au 10 juin 2014. N°455. Available at: <http://www.invs.sante.fr/Publications-et-outils/Bulletin-hebdomadaire-international/Tous-les-numeros/2014/Bulletin-hebdomadaire-international-du-4-au-10-juin-2014.-N-455>
4. Institut de Veille Sanitaire. Situation épidémiologique du chikungunya dans les Antilles. Available at: <http://www.invs.sante.fr/Publications-et-outils/Points-epidemiologiques>
5. Ministerio de Salud de El Salvador. Boletín epidemiológico sobre dengue actualizado a la semana epidemiológica 32 de 2014. Available at: http://www.salud.gob.sv/archivos/vigi_epide2014/dengue2014/dengue32_2014.pdf