



# Epidemiological Alert: Update on Dengue Outbreaks in the Americas

(8 September 2010)

## HEALTH ALERT DUE TO AN INCREASE OF DENGUE IN THE REGION

During the first semester of 2010, the epidemiological situation of dengue in the Region has displayed unstable behavior, with intense outbreaks of dengue in various countries of the Region. The climatological conditions have remained favorable for the proliferation of the *Aedes aegypti* mosquito – its transmitting agent – while certain unusual alterations have been observed in its seasonality, where, since the beginning of the year, Central American countries and Caribbean islands have been affected during periods that are considered unusual.

Currently, the Central American and Caribbean sub-regions are experiencing their rainy season. As a result, there has been an increase in transmission that could result in large populations being affected- including in areas where the problem was not common previously. This could be due either because they have been heretofore protected by cold weather or because they have experienced a delay in the start of the cold season; both conditions which prevent the spread of the agent.

Several factors exacerbate this situation. For instance, the lack of substantial changes in health infrastructure; persistent problems, like irregular water supply, which leads populations to store water inadequately; poor environmental sanitation, such as trash (plastic containers) and improperly disposed used tires, which accumulate water during rains. Added to the aforementioned elements, these factors contribute to increasing the mosquito population, and thus, allowing for the emergence of the disease and raising the risk of its spread.

Through this epidemiological alert, PAHO/WHO invites the countries of the Region to intensify their dengue control measures and to provide an integrated response, where these actions coincide to achieve a higher impact in the efforts to control the disease. The health sector will have to place its best effort in the diagnosis and treatment of dengue patients to prevent deaths while strengthening vector control measures. This should be done parting from the principle that an answer should be provided in an integrated manner; that is, the answer should be a collective effort from all the institutions in the health sector, other Ministries of Health, NGOs, the private sector and the general population.

At the same time, PAHO/WHO urges countries of the Region to continue the efforts in advancing in the implementation of the National Strategies for Integrated Management for the control and prevention of dengue, and to strengthen those components that are weakest. PAHO/WHO will continue providing technical support to the countries for the prevention and control of dengue outbreaks in the Region through the Dengue Expert Group (GT-Dengue International), especially in the areas of epidemiological surveillance, vector control, clinical management, laboratory diagnosis, environment and social and risk communication.

The rapid notification of increases in cases and/or outbreaks allows the Pan American Health Organization to rapidly coordinate international cooperation to increase the response capacity of

the affected country. The last section of this alert provides technical recommendations for the control of dengue outbreaks.

## Dengue Outbreaks in the Americas

The information in this update is based on data provided by the Ministries of Health of Member States through reports sent to the Pan American Health Organization/World Health Organization (PAHO/WHO), or on updates found on their websites.

**To date, the countries of the Region have reported a total of 1,432,410 dengue cases, 30,820 of which have been severe dengue. A total of 710 deaths have been reported, with a case fatality rate of 2.3%.**

The dengue incidence map shows the most affected countries by incidence, accumulated as of epidemiological week 34. Currently, the sub-regions with active transmission are Mexico and Central America and the Caribbean.

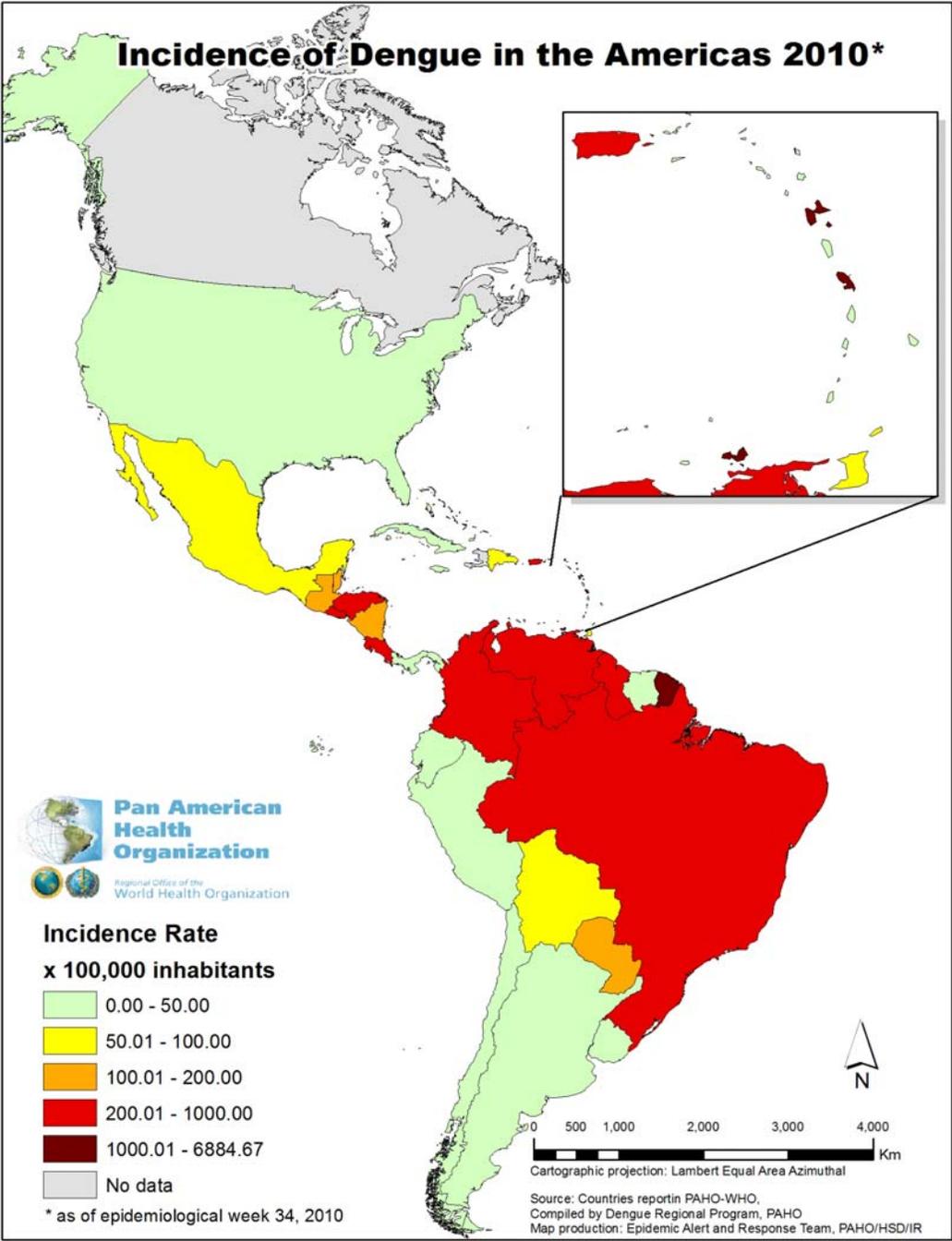


Table 1. Cases of dengue, severe dengue and deaths in the Region of the Americas, as of EW 34, 2010

Sub-region	Dengue total	Incidence Rate per 100.000 pop.	Severe Dengue	Deaths	Fatality Rate (%)
Central America and Mexico	169,960	115.66	4,743	109	2.30
Andean	209,011	204.04	14,845	152	1.02
Southern Cone	953,977	393.41	9,725	382	3.93
Caribbean (Hispanic)	18,306	77.24	755	46	6.09
Caribbean (non-Hispanic)	81,156	1,022.67	752	21	2.79
<b>TOTAL</b>	<b>1,432,410</b>	<b>273.62</b>	<b>30,820</b>	<b>710</b>	<b>2.30</b>

## Central America and Mexico

### COSTA RICA

**Number of Cases:** As of Epidemiological Week (EW) 33, 2010, Costa Rica's Ministry of Health reported 20,675 dengue cases. The cases reported at the national level during epidemiological weeks 1 to 23, 2010 surpassed the registered cases during the same period in the previous year by 621%. A downward trend can be observed starting on EW 30; however, the behavior is not homogenous and varies by region and within each region.

**Severity:** 10 severe dengue cases have been confirmed. Four possible deaths as a result of severe dengue – one in the Abangares area, one in Santa Cruz and one in Liberia – are currently under investigation.

**Serotypes in Circulation:** DEN-1, 2 and 3.

**Affected Areas:** Regions of Chorotega (Cañas, Carrillo, Abangares and Santa Cruz), Pacifico Central (Peninsula, Canton de Puntaneras and Rural), Central Norte (Alajuela), Huetar Atlantica, Central sur and Brunca, with 98% of the total incidence accumulated.

### EL SALVADOR

**Number of Cases:** As of EW 33, 2010, El Salvador's Ministry of Health reported 18,082 dengue cases of which 7,558 have been confirmed by laboratory.

**Severity:** 135 severe dengue cases have been confirmed, including one death, with a case fatality rate of 0.74%

**Serotypes in Circulation:** DEN-1, 2.

**Affected Areas:** The provinces with the highest incidence rates for cases confirmed by the Sanitary System of Health for every 100,000 people are: Santa Ana (270.7), Chalatenago (261.3), Cabanas (256.4), Oriente de San Salvador (239.7), Cuscatlan (234.5) and La Paz (195.3).

**Measures Taken:** The rainy season raises the risk of increasing the larval indexes of *Aedes aegypti*. Control measures aimed at eliminating hatcheries, as well as at tracking the epidemic in coordination with organizations that make up the Inter-institutional Commission of Health (CISALUD), are still in place. On Thursday, 26 August, Salvadorians celebrated the "National Day Against Dengue", which was established by decree. Also during that week, there were hatchery elimination and control mobilizations at each of the 17 Integrated Basic Health System Improvement (SIBASI) centers of the country.

## GUATEMALA

**Number of Cases:** As of EW 33, 2010, the Ministry of Health of Guatemala reported 11,873 clinical cases of dengue, of which 1,939 have been confirmed by laboratory.

**Severity:** 123 severe dengue cases have been confirmed, including 25 deaths. The case fatality rate is 20%.

**Measures Taken:** Measures to control the vector are in effect in the most affected municipalities. In August, PAHO/WHO provided technical assistance in the area of patient care. The Ministry of Health continues training health personnel in dengue patient management. Also, there was a meeting between the ministries of health of Honduras, Guatemala, and El Salvador to coordinate cross-border measures for dengue control.

## HONDURAS

**Number of Cases:** As of EW 33, 2010, the Ministry of Health of Honduras reported the largest dengue outbreak in its history with 53,796 clinical dengue cases. The disease's trend had an exponential growth from EW 19 to EW 29, and then it stabilized for two weeks to experience a sustained decline in the last three weeks.

**Severity:** 1,791 severe dengue cases have been confirmed, including 60 deaths. The case fatality rate is 3.3%.

**Serotypes in Circulation:** DEN-1, 2, 3, and 4.

**Affected Areas:** Metropolitan area of the capital district, 28,114 cases (52%); Metropolitan area of San Pedro Sula, 5,121 cases (10%); Olancho, 5,111 cases (10%) Choluteca, 2,641 cases (5%); El Paraiso, 2,043 cases (4%). These four regions accumulated 81% of the total cases.

**Measures Taken:** Since the declaration of emergency on 22 June, the government of Honduras increased control activities for the outbreak. PAHO/WHO of Honduras has been supporting from the beginning of the outbreak measures based on recommendations by the dengue team, which visited the country in March 2010 (GT-dengue).

In the past two months, permanent support has been given to the components of management, risk communication, entomology, laboratory, and patient care. Currently, coordination for new support in the management of severe dengue with PAHO/WHO's GT-dengue expert, Dr. Ernesto Pleites, is underway (13 to 17 September).

## MEXICO

**Number of Cases:** As of EW 32, Mexico's Secretariat of Health reported 57,971 severe clinical dengue cases.

**Severity:** 2,520 severe dengue cases, including 20 deaths, have been recorded, with a case fatality rate of 0.79%.

**Serotypes in Circulation:** DEN- 1, 2, 3, with DEN-2 predominating.

**Affected Areas:** The most affected states are: Guerrero, Yucatan, Quintana Roo, Colima, and Jalisco. At the national level, the number of confirmed cases is smaller with respect to what was registered in the previous two years; however, the disease's trend during the last five weeks shows an increase that coincides with the period of highest transmission in the country.

**Measures Taken:** Vector control, environmental improvement and public education measures are currently in place.

## United States of America (Florida)

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**Number of Cases:** In 2009, 27 autochthonous cases were identified in Key West, Monroe County, Florida, with DEN 1 isolations. It had been 40 years since autochthonous cases had been detected in Florida. On 13 August, 2010, health authorities once again confirmed the circulation of autochthonous cases (26 cases), all of them from Key West, Monroe County, Florida.

**Serotypes in Circulation:** DEN-1.

**Severity:** All the cases have been identified as dengue with no complications.

**Measures Taken:** Given the presence of *Aedes aegypti* and *Aedes albopictus*, and the numerous dengue cases in Florida, the introduction of a sustained transmission cycle in the state is a real threat. The measures taken have been oriented at controlling the vector and educating the population.

## Andean Sub-Region

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### COLOMBIA

**Number of Cases:** As of EW 33, 2010, a total of 126,378 cases were reported to the National Surveillance System (SIVIGILA), of which 59,350 have been laboratory confirmed.

**Severity:** 8,422 severe dengue cases, 4,370 of which have been laboratory tested, were reported. Additionally, 149 deaths were recorded as a result of dengue, and 31 are currently being studied.

**Serotypes in Circulation:** DEN-1, 2, 3 and 4, with DEN-2 predominating.

**Affected Areas:** At the national level, the epidemic curve continued above the epidemic threshold, but with a declining trend for over 10 weeks. During week 33, an increasing trend in cases has been observed in the departments of Antioquia, Barranquilla, Cartagena, and Sucre.

**Measures Taken:** Vector control measures remain in place.

### VENEZUELA

**Number of Cases:** As of EW 31, 2010, Venezuela's Ministry of Health reported a total of 68,753 dengue cases. The number of cases has surpassed the epidemic threshold, with a stabilizing trend during the last weeks (21-31), with a slight decline.

**Severity:** A total of 6,418 severe dengue cases were confirmed. No fatal cases were reported by the health authorities, but there are two cases which are currently under investigation.

**Serotypes in Circulation:** DEN-1, 2, 3, and 4, with DEN 2 predominating.

**Affected Areas:** the national incidence rate is of 238.4 for every 100,000 inhabitants; however, this rate is surpassed in 13 departments (Amazonas, Merida, Tachira, Monagas, Nueva Esparta, Miranda, Trujillo, Guarico, Barinas, Federal District, Apure, Lara y Aragua).

**Measures Taken:** There is permanent technical assistance and cooperation between PAHO/WHO and Venezuela's Ministry of Health.

## Southern Cone

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### BRAZIL

**Isolation of DENV 4 serotype in Roraima, Brazil.** On 30 July, 2010, Roraima's Secretary of Health notified the Secretariat of Health Surveillance/Superintendence of a suspected case of Dengue due to DEN 4. This case is autochthonous of Boa Vista, capital of the state, and was detected at a viral surveillance reference test unit. The initial diagnosis was obtained through RT-PCR and viral isolation, and was processed at the central laboratory of Roraima and confirmed through counter tests by the Evandro Chagas Institute. It is important to point out this event's epidemiological significance given that DEN 4 has not been in circulation in Brazil for many years.

**Measures Taken:** The epidemiological investigations of the transmission of nine autochthonous DEN 4 cases confirmed the infection of 8 cases in the municipality of Boa Vista, and one case in Cato. The average age of the cases was 23 years, and all were classified as dengue without complications.

Measures taken include communication to the population, epidemiological surveillance, and vector control in the municipalities of Boa Vista and Cato, where the cases were isolated. DEN 4 serotype had not been identified in Brazil since 1984, although it actively circulates in various countries of the Americas, including Argentina, Colombia, Peru, Venezuela, Puerto Rico, Dominican Republic, and Honduras.

## Hispanic Caribbean

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### PUERTO RICO

**Number of Cases:** As of EW 21, 2010, the Secretariat of Health of Puerto Rico reported 9,719 dengue cases, 4,811 of which have been confirmed by laboratory. According to the epidemic curve, the outbreak's trend continues to increase, and the trend has yet to stabilize.

**Severity:** 27 severe dengue cases have been reported, including 8 deaths.

**Serotypes in Circulation:** DEN-1, 2, 4.

**Measures Taken:** Control measures by the Secretariat of Health are still in place. Also, the population has been instructed on preventive measures, which help control the vector.

### DOMINICAN REPUBLIC

**Number of Cases:** As of EW 33, 2010, the Dominican Republic's Ministry of Health reported 8,587 dengue cases, 4,288 of which have been confirmed by laboratory.

**Severity:** 729 severe dengue cases have been confirmed, including 38 deaths. The case fatality rate is 5.2%.

**Serotypes in Circulation:** DEN-1, 2, 4.

**Affected Areas:** The largest number of cases come from 13 provinces: Santiago, Santo Domingo National District, San Cristobal, La Vega, Espaillat, Monte Cristi, Monsenor Noel, Puerto Plata, Salcedo, Peravia, Duarte, and Valverde. The provinces with incidence trends superior to the national trend, in order of frequency are: Monte Cristi, Salcedo, Santiago, Espaillat, San Jose de Ocoa, Monsenor Noel, Peravia, Hato Mayor, Da Jabon, La Vega, Valverde, and Puerto Plata.

**Measures Taken:** Door-to-door campaigns to raise awareness of the problem and to eliminate hatching sites in every province. Distribution of educational materials at tolls, avenues, educational establishments, and shopping malls, starting in July in the provinces of Santo Domingo and National District. Creation of community social networks in 5 provinces of the country, representing

50% of the established goal. Currently, entomological surveys are taking place in provinces with the largest number of cases, and in 12 provinces the obtained data are being analyzed. School days dedicated to eliminating mosquito hatcheries, with guides for teachers and students in all basic and intermediate level schools of the country through an agreement with the Ministry of Health, and Ministry of Education are in place. Discuss the death audits associated with dengue. This week, a dengue expert's technical assistance will be provided for the assessment of dengue cases with the Ministry of Health.

## French Territories

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**Summary:** The *Cellules interrégionales d'épidémiologie Antilles* (CIRE) reported dengue outbreaks in French Guiana, Guadeloupe, and Martinique via its epidemiological newsletter.

- In **Guadeloupe**, as of EW 33, 2010, there were 36,000 suspected dengue cases, 4,400 of which were confirmed. The number of cases that needed hospitalization was 297. Also, DEN-1 and 4 is currently in circulation and there have been 5 reported deaths as a result of the disease.
- In **Martinique**, as of EW 33, 2010, 29,200 dengue cases were reported, including 1,593 confirmed cases. The number of cases that needed hospitalization was 401, and there have been 12 deaths as a result of the disease. DEN-1 and 4 are currently circulating.
- In **Guyana**, as of EW 32, 2010, 8,100 dengue cases were reported, including 2,200 confirmed cases. Currently, DEN-1 and 4 are in circulation, and one death has been confirmed as a result of the disease.

## Technical Comments to take into Consideration to Control Dengue Outbreaks and Epidemics

Given that some countries in the Region are currently being affected by a dengue outbreak and have intensified their prevention and control measures, we recommend taking into account the following technical elements:

- Dengue is primarily a problem of domestic sanitation, so the elimination of vector breeding sites are the most important measures.
- It is necessary to define areas of high transmission risk (risk stratification) and prioritize where there are concentrations of people (schools, terminals, hospitals, health centers, etc.) The presence of the mosquito must be eliminated within a diameter of at least 300mts.
- In areas with active transmission, spraying to kill adult mosquitoes to cut the transmission is of great importance.
- The critical factors for effective use of adulticide treatment (fumigation) include:
  - Proper selection of the insecticide, its formula, and knowing the susceptibility of mosquito populations to the insecticide.
  - Check the dosage and preparation of the mixture.
  - Ensure the size of the particle (droplet) spray, optimum 8-15 millimicrons MVD (Medium Volume Diameter), otherwise it will not impact the mosquito.
  - The implementation schedule should be in peak periods of mosquito flight.
  - Take into account optimal weather conditions; do not apply external spraying in rain, high winds, etc.
  - The greatest impact is achieved with domiciliary spraying, using individual equipment.
  - A minimum of three fumigation treatments in intervals of a maximum of seven days are necessary to reach complete virus elimination from both humans and the mosquitoes.
  - The degree of reduction of the population of adult females and survival of these must be assessed resulting from the applications to determine whether the suspension occurred in the transmission.
  - A misused fumigation strategy can mean the dispersal of adult mosquitoes to unaffected areas of the city.
- The monitoring and control actions (quality control) of field workers, in both focal and adulticide treatments (fumigation) is essential.
- The strategy of social communication for behavior change must be well targeted to the major vector breeding sites. Time should not be wasted with trash that does not produce mosquitoes (waste of trees, debris etc.).
- As actions for vector control increase (adulticide and larval control by trained personnel, sanitation measures and the promotion of community actions) their impact will be greater and results will be seen in less time.
- We must maintain high clinical and epidemiological surveillance. It is important to disseminate the warning signs of severe dengue among the population, so people can be treated on time, avoiding delayed diagnoses, severity and death.
- There must be a guide and an updated flowchart for a proper management of suspected dengue cases and severe dengue at all care levels, including the private sector. This will have a direct impact on preventing deaths.
- It is necessary and fundamental to involve other sectors, since many of the actions that can be taken within other ministries such as Environment, Education and Tourism, or other community institutions, police, municipality, and fire department among others.

Finally, it is worthy noting that countries have elaborated National Strategies for Integrated Management for the prevention and control of dengue. This is a strong technical instrument which should be implemented with all of its components.