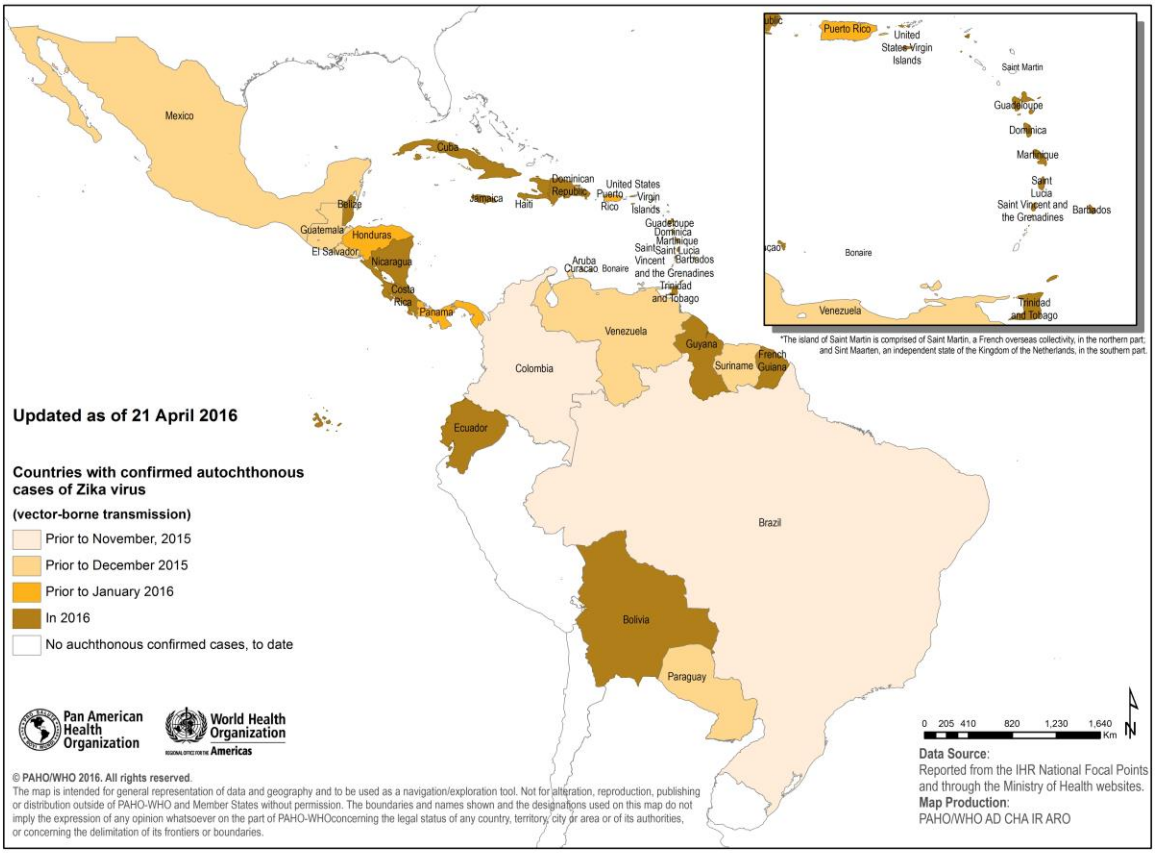
Zika - Epidemiological Update

21 April 2016

Zika virus – Incidence and trends

To date, 35 countries and territories have confirmed local, vector-borne transmission of Zika virus in the Region of the Americas since 2015 (**Figure 1**). Since the last Pan American Health Organization/ World Health Organization (PAHO/WHO) Zika Epidemiological Update of 14 April, no new countries or territories have confirmed vector-borne autochthonous transmission of Zika virus.

Figure 1. Countries and territories in the Americas with confirmed autochthonous (vector-borne) Zika virus cases, 2015-2016 (as of 21 April 2016)



Trends of Zika virus, at the Regional level, have been showing a downward trend in most countries of the Region of the Americas, as is being observed with other vector-borne

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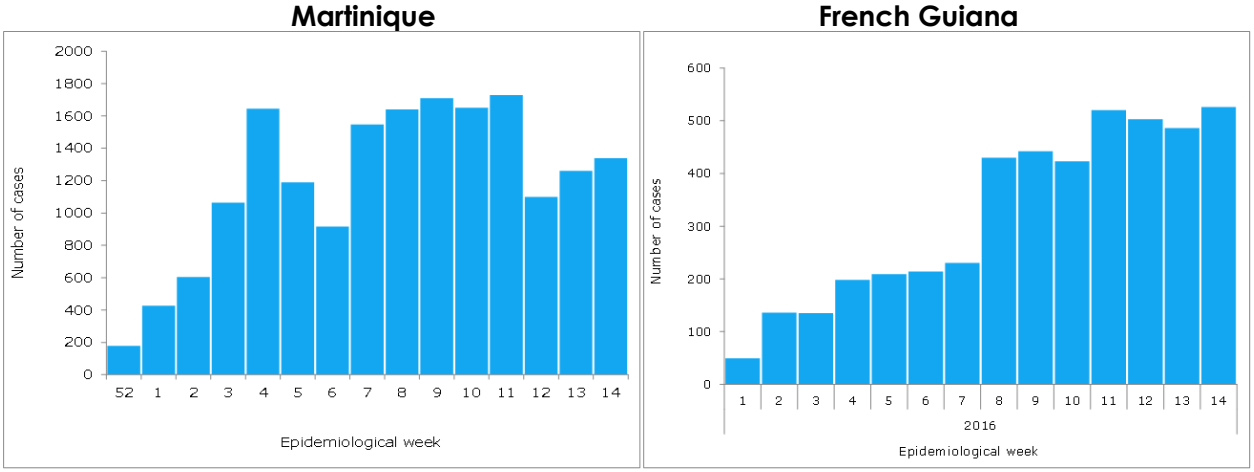
diseases in the same areas. However, this trend could change in the coming weeks when retrospective data is received and with some sub-regions entering their seasons of highest circulation of vector-borne diseases.

This week the Zika virus situation in Martinique and French Guiana are highlighted below.

In **Martinique** Zika virus cases have been increasing since epidemiological week (EW) 52 of 2015 to EW 7 of 2016 (**Figure 2**). Subsequently a stable trend with elevated case numbers is observed between EW 7 to 11 with an average of 1,650 cases per week. A noticeable decrease in case numbers is observed in EW 12 and the following weeks; this decline is likely due to school holidays, including Easter, and the closure of some medical offices. Accordingly data from those weeks should be interpreted with caution. During the EW 14 the number of cases increased slightly compared to the previous week.

Similarly, in **French Guiana**, reports of Zika virus cases started increasing since EW 1 to EW 8 of 2016 (**Figure 2**). After a sharp increase in EW 8, a stable trend with 454 cases per week was reported until EW 11. Subsequently, a decrease in cases is observed in EW 12 and EW 13, for the first time since the beginning of the outbreak. French Guiana, like Martinique, observes the same holidays signifying the closure of schools and some medical offices during that time. The data for that period should be interpreted with caution. Like Martinique, in EW 14 the number of cases increase slightly compared to the previous week.

Figure 2. Cumulative Zika virus (confirmed and suspected) cases reported in Martinique and French Guiana by epidemiological week (2015-2016)



Source: Published by the French Institute of Public Health Surveillance (Institut de veille sanitaire -INVS) and reproduced by PAHO/WHO.

Guideline for surveillance of Zika virus disease and its complications, PAHO/WHO, 2016

On 15 April 2016, PAHO/WHO published the *Guideline for surveillance of Zika virus disease and its complications*. The Guideline was developed through the experience gained during the current outbreak in the Region of the Americas. This document includes a brief clinical description of Zika virus disease, its neurological manifestations, and the Zika congenital syndrome. Finally, case definitions and laboratory procedures for case detection and

diagnosis are presented. The Guideline is available online in Spanish and the English version will be released soon. PAHO/WHO encourages Member States to adopt the proposed case definitions, document its uses in order to review and updated on evidence based as needed. See full Guideline.

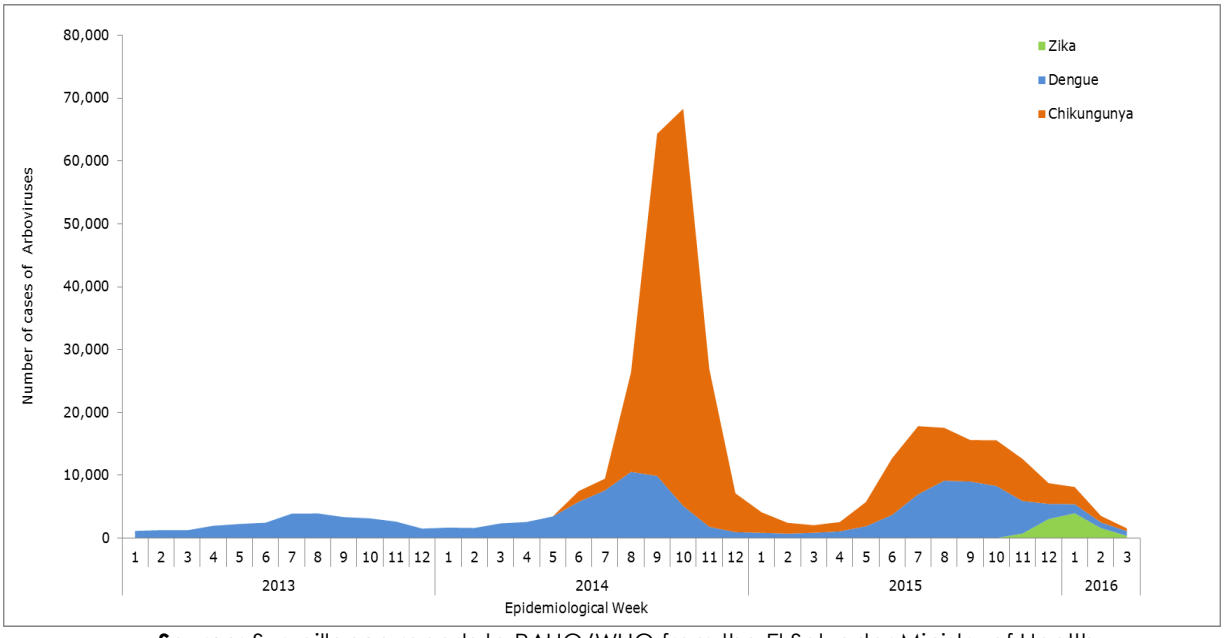
Trends of reported arbovirus cases (dengue, chikungunya, and Zika virus) and suspected measles and rubella cases

In this Epidemiological Update the trends of Zika virus and other arboviruses (dengue and chikungunya) in El Salvador and trends of Zika virus, other arboviruses (dengue and chikungunya) and suspected measles and rubella cases in Honduras are presented below.

El Salvador

Since June 2014, **El Salvador** has been experiencing simultaneous circulation of dengue and chikungunya with seasonal peaks between July and August every year. Zika was detected in El Salvador in October 2015 and as of mid-April 2016, a total of 9,187 suspected cases of Zika virus had been reported at the national level, with a peak of 3,691 cases observed in January 2016. The trends for all three arboviruses have since been decreasing with the number of chikungunya and dengue cases returning to below epidemic threshold levels as expected for this time of the year (**Figure 3**).

Figure 3. Reported cases of chikungunya, dengue and Zika virus by month, El Salvador 2013-2016.



Source: Surveillance reports to PAHO/WHO from the El Salvador Ministry of Health

Honduras

Between 2013 and 2015, an average of 42,000 cases of dengue cases was reported annually in **Honduras**. In 2013, the dengue peak occurred in July, and in contrast in 2014, the peak occurred three months later. This peak in 2014 and the continuing increase of

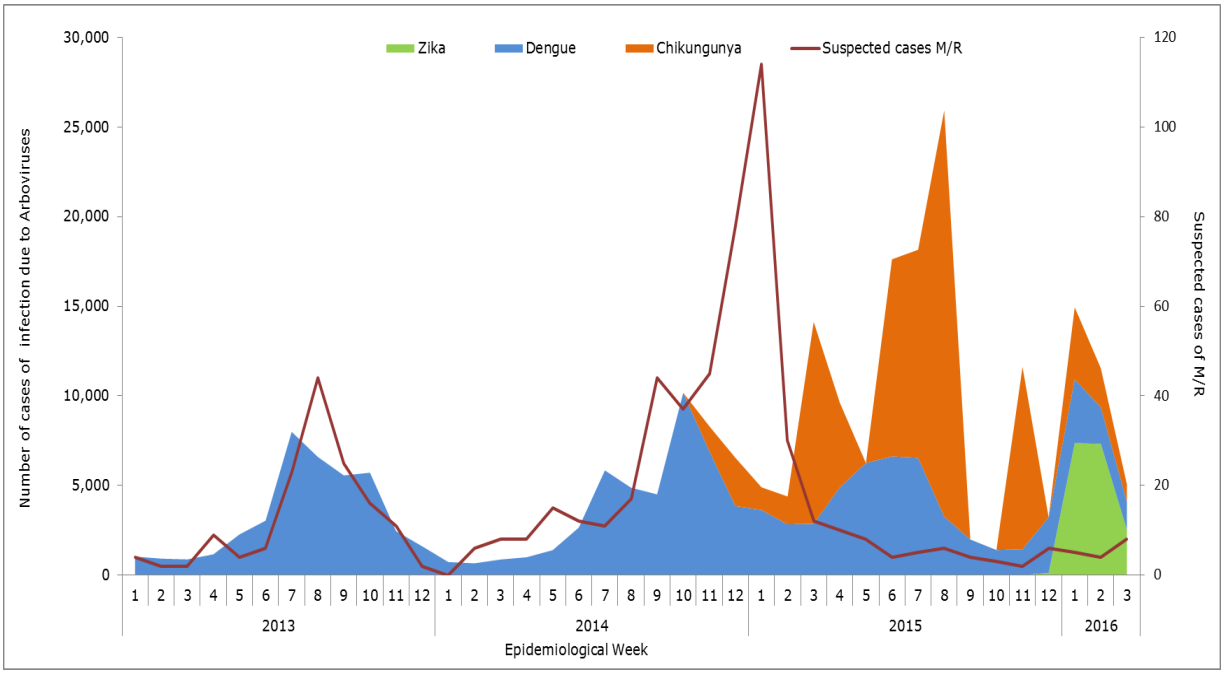
cases in the subsequent months coincided with the detection of first chikungunya cases (**Figure 4**). A similar situation was observed with the detection of Zika virus in December 2015, when dengue reported cases increased threefold in comparison to the average number of cases reported in the preceding three months.

In Honduras the Zika virus trends shows an ongoing outbreak with a slight decrease in number of cases reported between January and February 2016. However, due to the upcoming period of higher transmission of mosquito-borne diseases in the country the number of cases reported may increase.

It is noteworthy that the first chikungunya outbreak in November 2014 coincided with a steady increase in number of suspected measles and rubella cases (**Figure 4**). A total of 348 suspected measles and rubella cases were reported between September 2014 and February 2015 which represent five times and 14 times the total number reported in the same period in 2013-2014 and 2015-2016 respectively.

These observations reinforce the need for having strong surveillance systems for measles and rubella (eliminated diseases in the Region of the Americas) and highlight the importance of integrated analysis of different surveillance systems to better understand the emergence of Zika virus and other arboviruses.

Figure 4. Reported cases of arboviruses (dengue, chikungunya, and Zika virus) and suspected measles and rubella (M/R) cases, Honduras, 2013-2016.



Source: Surveillance reports to PAHO/WHO from the Honduras Ministry of Health

Sexual transmission of Zika virus

Although the primary mode of transmission of Zika virus is vector-borne, surveillance system in countries, without autochthonous circulation of Zika virus or presence of the vector mosquito, have detected sexually transmitted cases of Zika virus. In the Americas Region,

Argentina (1 case), Chile (1 case), Peru (1 case), and the United States of America (6 cases) have reported sexually transmitted Zika virus cases.

In all reported cases, transmission occurred in people who had sexual contact with men who had history of travel to countries where Zika virus is circulating, and presented Zika virus symptoms shortly before or at the time of sexual contact. Seven of the nine sexually transmitted cases of Zika virus reported clinical characteristics which are presented in **Table 1.**

Table 1. Clinical characteristic of sexually transmitted Zika virus in the Region of the Americas (as of 21 April 2016)

Signs and symptoms	Number of Cases*	%
Rash	6	86
Conjunctivitis	5	71
Fever	5	71
Arthralgia	5	71
Myalgia	4	57
Pruritus	3	43
Headache	2	29

*Total of 7 cases reporting clinical characteristics.

Zika virus infection in pregnant women

Detection of Zika virus infection in pregnant women is being heightened in countries in the Region due to risk of congenital Zika syndrome. Confirmed and suspected cases of Zika virus infection have been reported in pregnant women in 20 countries and territories of the Americas (**Table 2**). Results of the surveillance of pregnant women in both Colombia and Martinique are highlighted below.

Table 2. Countries and territories in the Americas reporting confirmed and suspected cases of Zika virus in pregnant women (as of 21 April 2016).

Countries and territories reporting Zika virus in pregnant women			
Barbados	Dominican Republic	Guatemala	Panama
Brazil	Ecuador	Honduras	Paraguay
Bolivia	El Salvador	Martinique	Puerto Rico
Colombia	French Guiana	Mexico	Saint Martin
Costa Rica	Guadeloupe	Nicaragua	Venezuela

Colombia

In **Colombia**, a total of 12,380 pregnant women have been identified with suspected or confirmed Zika virus infection since the beginning of the outbreak up to EW 14 of 2016. Of

these, 1,706 pregnant women have been laboratory confirmed with Zika virus; the remaining 10,674 presented with symptoms of Zika virus without laboratory confirmation.

Martinique

In **Martinique**, since the emergence of the virus as of 14 April 2016, Zika virus infection was confirmed in 142 pregnant women. This figure is cumulative and some of the women have already given birth.

Congenital syndrome associated with Zika virus infection[1]

No new countries have reported cases of congenital syndrome associated with Zika virus (**Table 3**) since the last PAHO/WHO Zika Epidemiological Update of 14 April. For the United States of America, the number of confirmed congenital syndrome associated with Zika virus infection was updated to two cases to reflect the previous imported case, a fetus born to a woman with brief period of travel to Belize, Guatemala or Mexico mentioned in the New England Journal of Medicine article titled "Zika Virus Infection with Prolonged Maternal Viremia and Fetal Brain Abnormalities" and mentioned in the previous Epidemiological Update.

Table 3. Countries and territories in the Americas with reported congenital syndrome associated with Zika virus infection (as of 21 April 2016)

Countries reporting congenital syndrome associated with Zika virus	Number of confirmed cases to date
Brazil	1,168
Colombia	7
Martinique[2]	3
Panama	3
United States[3]	2

Brazil

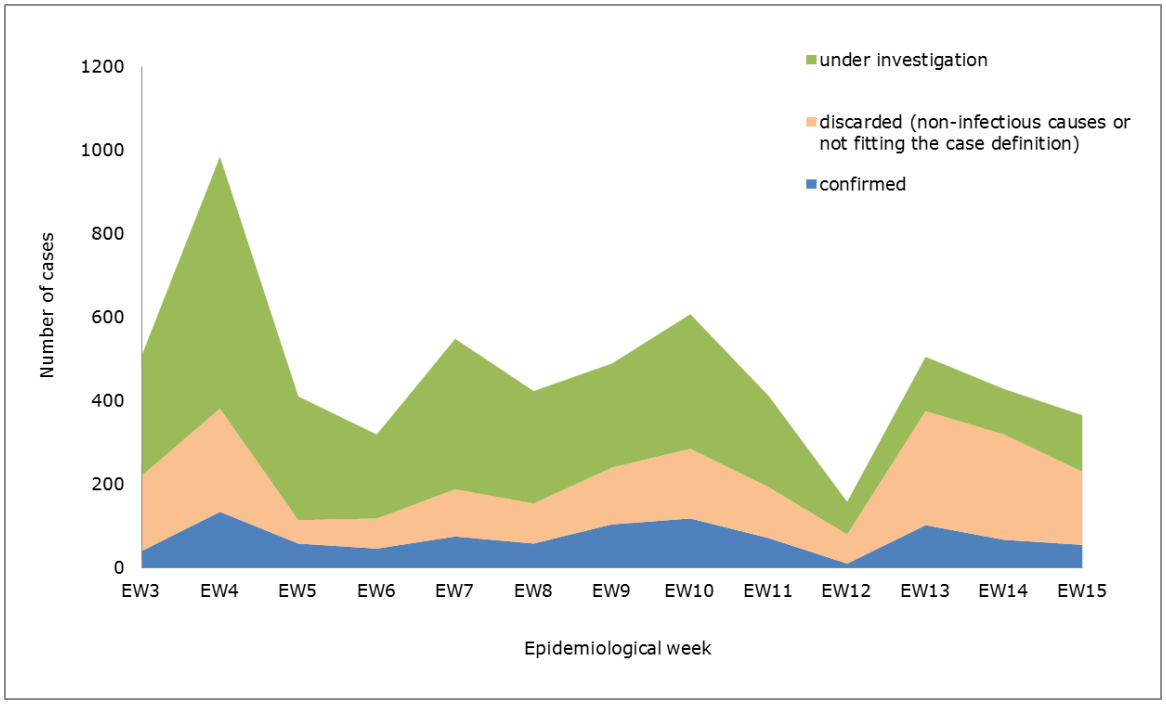
According to the Ministry of Health of **Brazil**, between 22 October 2015 and 16 April 2016, a total of 7,150 suspected cases of microcephaly and other congenital malformation as per Brazil's Surveillance and Response Protocol[4] have been reported in 1,384 out of 5,570 municipalities. Of these, the Brazil Ministry of Health confirmed 1,168 cases of microcephaly by clinical, radiological and/or laboratory methods (192 have been confirmed by PCR and serology). Out of the total reported cases, 2,241 cases were discarded as being due to non-infectious causes or not fitting the case definition, and 3,741 remain under investigation.

[1] Case definition available at: http://bit.ly/1TpcVIS
[2] Two microcephaly and one other fetal anomaly. See full report.
[3] Imported case from Brazil (see full report) and imported case where the mother had travel history to Belize, Guatemala and Mexico (see full report).
[4] Surveillance and Response Protocol. See full report.

The confirmed cases are distributed in 22 out of 27 Federal Units, with the Northeast region continuing to report the majority of the cases. Of the total cases, the Northeast region reported 73% (2,721) of the total of suspected cases and 92% (1,077) of the total of confirmed cases.

An average of 197 microcephaly cases were investigated (confirmed and discarded) weekly between EW 3 and EW 12 of 2016 and between EW 13 and 15 of 2016, there was an average of 308 cases investigated weekly (**Figure 5**). This weekly increase of around fifty percent between the two periods suggests an increased celerity in confirming and discarding cases in the more recent weeks compared to the earlier epidemiological weeks.

Figure 5. Reported cases of microcephaly and other congenital malformation, under investigation, discarded or confirmed by epidemiological week, Brazil, EW 3 – EW 15 of 2016



Source: Data published by the Brazil Ministry of Health and reproduced by PAHO/WHO

As of EW 15 of 2016, there have been 246 reported deaths (including miscarriages or stillbirths), of which 51 were confirmed as microcephaly cases by clinical, radiological and/or laboratory methods. See full report.

Guillain-Barré syndrome (GBS) and other neurological disorders

To date, 7 countries in the Region have reported an increase in cases of Guillain-Barré syndrome (GBS) with at least one case laboratory confirmed for Zika virus. As mentioned in the PAHO/WHO Zika Epidemiological Update of 14 April, **Paraguay** reported an increase in GBS cases, and none of the cases have laboratory results confirming Zika virus. Five other countries and territories have not recorded increases but identified Zika virus-associated cases of GBS (**Table 4**).

Table 4. Countries and territories in the Americas with GBS in the context of Zika virus circulation (as of 21 April 2016)

Increase in GBS plus Zika virus lab confirmation in at least one case of GBS	Zika virus lab confirmation in at least one case of GBS	Increase in GBS with no Zika virus lab confirmation in any of the cases
Brazil	French Guiana	Paraguay
Colombia	Haiti	
Dominican Republic	Martinique	
El Salvador	Panama	
Honduras	Puerto Rico	
Suriname		
Venezuela		

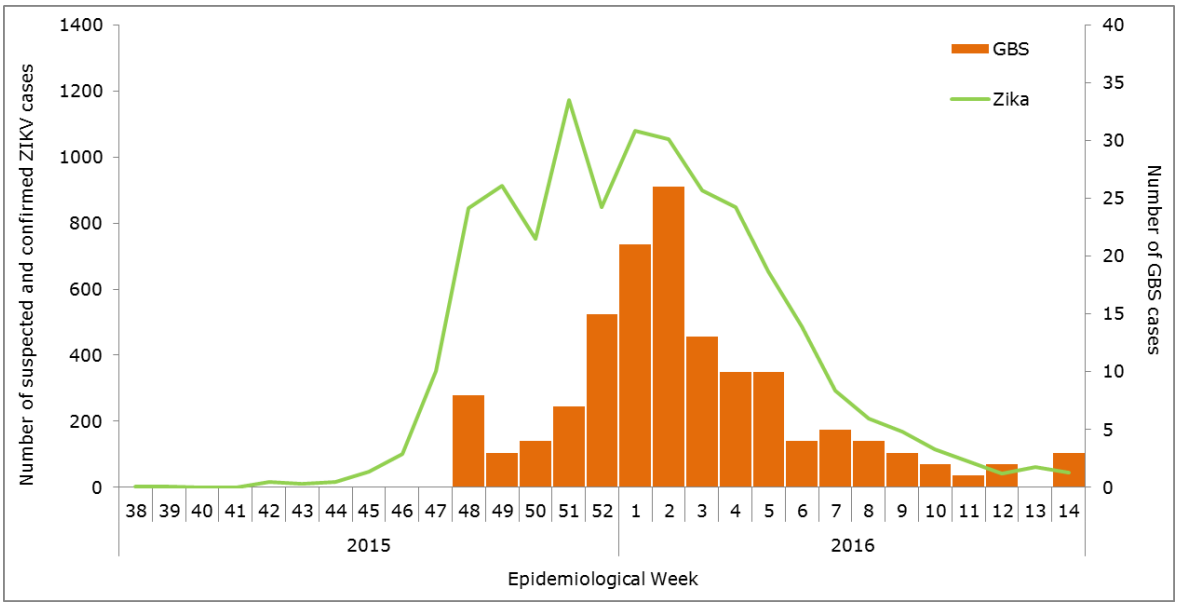
The following is new information on countries with updates.

GBS trends in El Salvador

Between EW 48 of 2015 and EW 14 of 2016, **El Salvador** reported 141 cases of GBS, including 5 deaths. On average, 169 GBS cases have been recorded annually nationwide.

More than 45% of the reported Zika virus cases and 58% of the GBS cases occurred between EW 51 of 2015 and EW 3 of 2016. A downward trend in the number of Zika cases is observed starting in EW 3 and has continued steadily since. The GBS peak of 26 cases coincided with one of the epidemiological weeks reporting elevated Zika virus cases (EW 2) as well. Since its peak, the number of GBS cases has also been decreasing steadily. A temporal correlation is observed when comparing the dynamics of Zika virus with the incidence of GBS cases (**Figure 6**).

Figure 6. Reported (confirmed and suspected) cases of Zika virus and GBS in El Salvador by Epi Week, 2015 to 2016

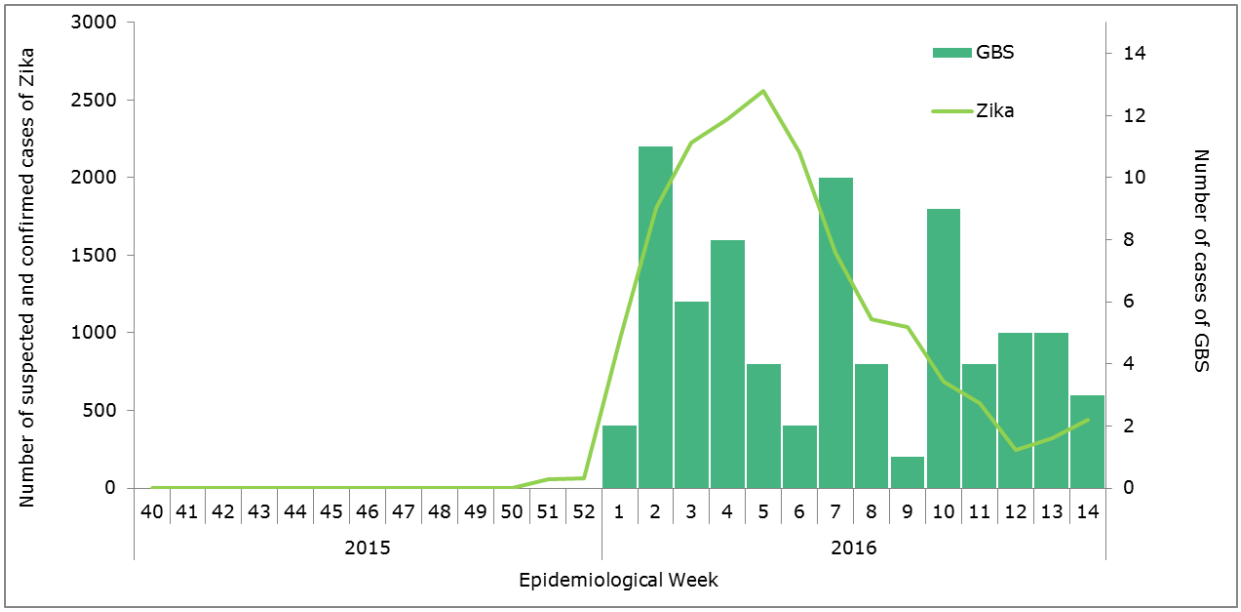


Source: Surveillance reports to PAHO/WHO from the El Salvador Ministry of Health

GBS trends in Honduras

Between EW 1 and EW 14 of 2016, **Honduras** reported 74 cases of GBS. On average, 112 cases of GBS have been reported annually in the country between 2010 and 2015 according to hospital discharge records. The first report of GBS cases in EW 1 of 2016 coincided with a 15 fold increase in Zika virus cases (**Figure 7**). The majority of Zika virus cases (82%) and GBS cases (62%) were reported between EW 2 and EW 9 of 2016. While cases of both Zika virus and GBS have been on a consistent downward trend since EW 7 of 2016, sporadic fluctuation in case numbers can be noticed, possibly due to delays in notification. Similar to El Salvador, a temporal correlation between Zika virus and GBS cases is observed in Honduras.

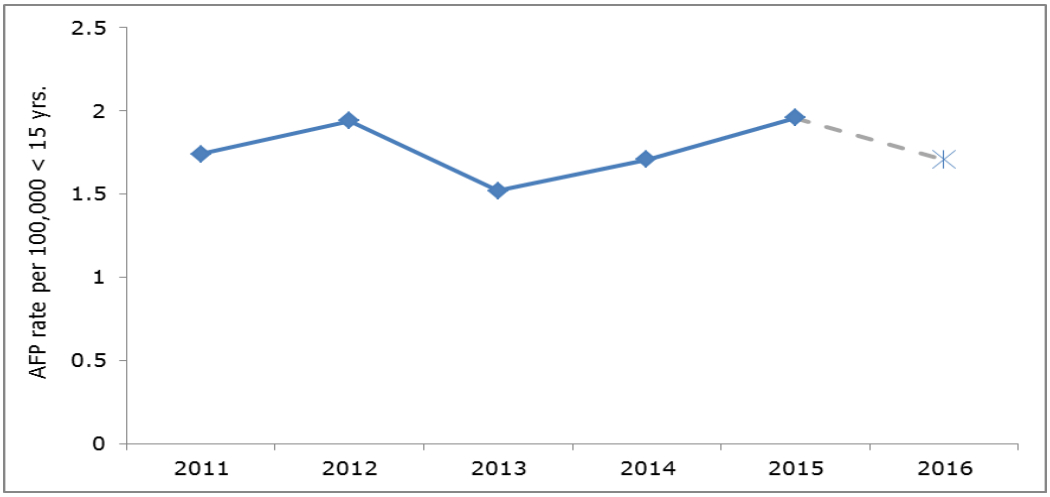
Figure 7. Reported cases of Zika virus and GBS in Honduras by Epi Week, 2015 to 2016



Source: Surveillance reports to PAHO from Honduras Ministry of Health

Furthermore, in 2015, an increase in the rate of acute flaccid paralysis (AFP) cases was observed compared to the previous two years, coinciding with the introduction of Zika virus in Honduras. In 2016, the AFP rate from the first 14 epidemiological weeks has already reached similar levels as the AFP rate for the whole year in 2013 and 2014 (**Figure 8**). If this trend continues, a greater than average rate of AFP can be expected for 2016 coinciding with the increased cases of GBS and Zika virus cases (**Figure 7**).

Figure 8. AFP rates per 100,000 in children up to 15 years old. Honduras, 2011-2016[5]



Source: PAHO/WHO Polio Weekly Bulletin. See Bulletin.

Significant Findings

Zika virus detection in *Aedes albopictus* in Mexico

On 20 April 2016, the Mexico International Health Regulations (IHR) National Focal Point (NFP) reported that on 28 March the Arbovirus and Hemorrhagic virus Laboratory of the Institute of Epidemiological Diagnosis and Reference (InDRE) received *Aedes albopictus* mosquitos for testing from the San Luis Potosi State Public Health Laboratory as part of the

[5] As of EW 14 of 2016

entomolo-virologic surveillance. The mosquitos were tested by real time RT-PCR to detect Zika virus.

On 1 April, the InDRE confirmed the detection of Zika virus in the mosquitoes. This is the first evidence of the presence of Zika virus in *Aedes albopictus* captured in the environment in Mexico and in the Americas.

This finding demonstrates the quality of work conducted by the Mexico Epidemiological Surveillance System (SINAVE).

Zika virus infection in nonhuman primates in Brazil

A recent study published by researchers from Brazil reported the discovery of nonhuman primates infected with Zika virus in the state of Rio Grande do Norte, located in the northeast of the country.

The detection occurred in samples of 4/15 marmosets (*Callithrix jacchus*) and 3/9 capuchin monkeys (*Sapajus libidinosus*) captured between July and November 2015 in the state of Ceara, an área where Zika virus is circulating. Subsequent sequencing of the virus showed 100% similarity with other Zika virus detected in South America. See full report.

Nonhuman primates were captured in several areas that are ecologically different and distant from one another.

A similar finding was reported in the PAHO/WHO Zika Epidemiological Update of 14 April, with regards to the detection of a howler monkey infected with Zika virus in Ecuador.

To date there is no evidence that Zika virus is transmitted to humans by contact with the monkeys. Further research is needed to determine the role of these nonhuman primates in the epidemiology of the disease.

Zika virus was first isolated in a Rhesus monkey in the Zika forest in Uganda in the 1940s. The prevalence of Zika virus in monkeys and other nonhuman primates remains unknown.