World Health Organization

ZIKA VIRUS MICROCEPHALY AND GUILLAIN-BARRÉ SYNDROME

SITUATION REPORT
21 APRIL 2016

SUMMARY

From 1 January 2007 to 20 April 2016, Zika virus transmission was documented in a total of 66 countries and territories.

Mosquito-borne transmission:

- 42 countries are experiencing a first outbreak of Zika virus since 2015, with no previous evidence of circulation, and with ongoing transmission by mosquitos.
- 17 countries have reported evidence of Zika virus transmission prior to 2015, with or without ongoing transmission or have reported an outbreak since 2015 that is now over.

Person-to-person transmission:

- Eight countries have now reported evidence of person-to-person transmission of Zika virus, other than mosquito-borne transmission (Argentina, Chile, France, Italy, New Zealand, Peru, Portugal and the United States of America).

In the week to 20 April, no additional countries have reported mosquito-borne Zika virus transmission. Peru and Portugal are the latest countries to report person-to-person transmission.

Microcephaly and other fetal malformations potentially associated with Zika virus infection or suggestive of congenital infection have been reported in six countries (Brazil, Cabo Verde, Colombia, French Polynesia, Martinique and Panama). Two cases, each linked to a stay in Brazil, were detected in Slovenia and the United States of America. A further case, linked to a brief stay in Mexico, Guatemala and Belize, was detected in a pregnant woman in the United States of America.

In the context of Zika virus circulation, 13 countries and territories worldwide have reported an increased incidence of Guillain-Barré syndrome (GBS) and/or laboratory confirmation of a Zika virus infection among GBS cases.

Based on a growing body of research, there is scientific consensus that Zika virus is a cause of microcephaly and GBS.

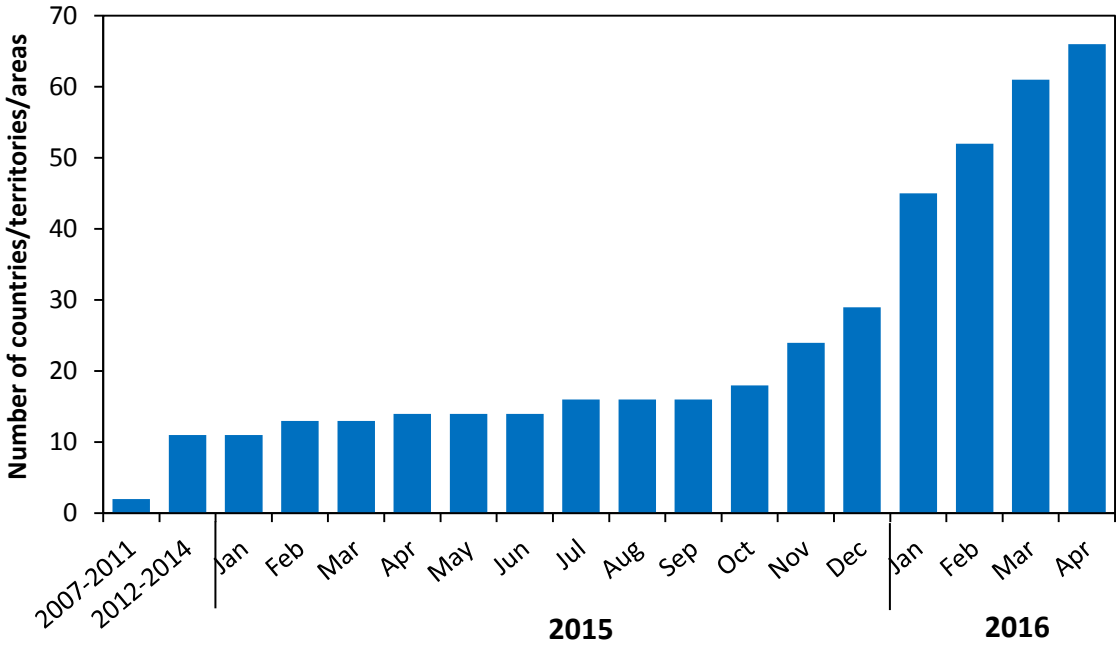
The global prevention and control strategy launched by the World Health Organization (WHO) as a Strategic Response Framework encompasses surveillance, response activities and research. This situation report is organized under those headings.

I. SURVEILLANCE

Incidence of Zika virus

- From 1 January 2007 to 20 April 2016, Zika virus transmission was documented in a total of 66 countries[1] and territories (Fig. 1; Tables 1 and 2). 42 countries are experiencing a first outbreak of Zika virus since 2015, with no previous evidence of circulation, and with ongoing transmission by mosquitos. 17 countries have reported evidence of Zika virus transmission prior to 2015, with or without ongoing transmission or have reported an outbreak since 2015 that is now over.
- Four countries, islands or territories have no further reports of ongoing transmission (Cook Islands, French Polynesia, ISLA DE PASCUA – Chile and YAP (Federated States of Micronesia), though transmission has been reported in another island of Federated States of Micronesia.
- In the week to 20 April, no additional countries have reported mosquito-borne Zika virus transmission.
- Eight countries have now reported evidence of person-to-person transmission of Zika virus, in the absence of mosquito-borne transmission (Argentina, Chile, France, Italy, New Zealand, Peru, Portugal and the United States of America) (Table 2).

Figure 1. Cumulative number of countries, territories and areas reporting Zika virus transmission in years, 2007-2014, and monthly from 1 January 2015 to 13 April 2016



- In the Region of the Americas, the geographical distribution of Zika virus has steadily widened since the presence of the virus was confirmed in October 2015. By 13 April 2016, 35 countries and territories in the Region of the Americas reported mosquito-borne transmission of the virus. In addition, four countries have reported sexual transmission of Zika virus (Fig. 2, Table 1).

[1] Note that Chile appears in both table 1 and 2, but is counted only once in the total of 66 countries.

- From 1 October 2015 to 10 April 2016, Colombia reported 65 338 suspected cases of Zika virus and 3292 laboratory confirmed cases of Zika.[2]

Table 1. Countries reporting vector-borne Zika virus transmission

Classification	WHO Regional Office	Country / territory / area	Total
Category 1. Countries experiencing a first outbreak of Zika virus since 2015, with no previous evidence of circulation, and with ongoing transmission by mosquitos.	**AFRO**	Cabo Verde	**1**
	AMRO/PAHO	Aruba, Barbados, Belize, Brazil, Bolivia (Plurinational State of), BONAIRE – Netherlands, Colombia, Costa Rica, Cuba, Curaçao, Dominica, Dominican Republic, Ecuador, El Salvador, French Guiana, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Puerto Rico, Saint Lucia, Saint Martin, Saint Vincent and the Grenadines, Sint Maarten, Suriname, Trinidad & Tobago, United States Virgin Islands, Venezuela (Bolivarian Republic of)	**35**
	SEARO	Maldives	**1**
	WPRO	American Samoa, Fiji, Marshall Islands, Samoa, Tonga	**5**
Subtotal			**42**
Category 2. Countries where there is evidence of Zika virus transmission prior to 2015, with or without ongoing transmission; or countries where an outbreak since 2015 is reported to be over.	**AFRO**	Gabon	**1**
	SEARO	Bangladesh, Indonesia, Thailand	**3**
	WPRO	Cambodia, Cook Islands, French Polynesia, Lao People's Democratic Republic, Malaysia, Micronesia (Federated States of), New Caledonia, Papua New Guinea, Philippines, Solomon Islands, Vanuatu, Viet Nam	**12**
	PAHO	ISLA DE PASCUA - Chile	**1**
Subtotal			**17**
Total			**59**

Categories are defined as follows:

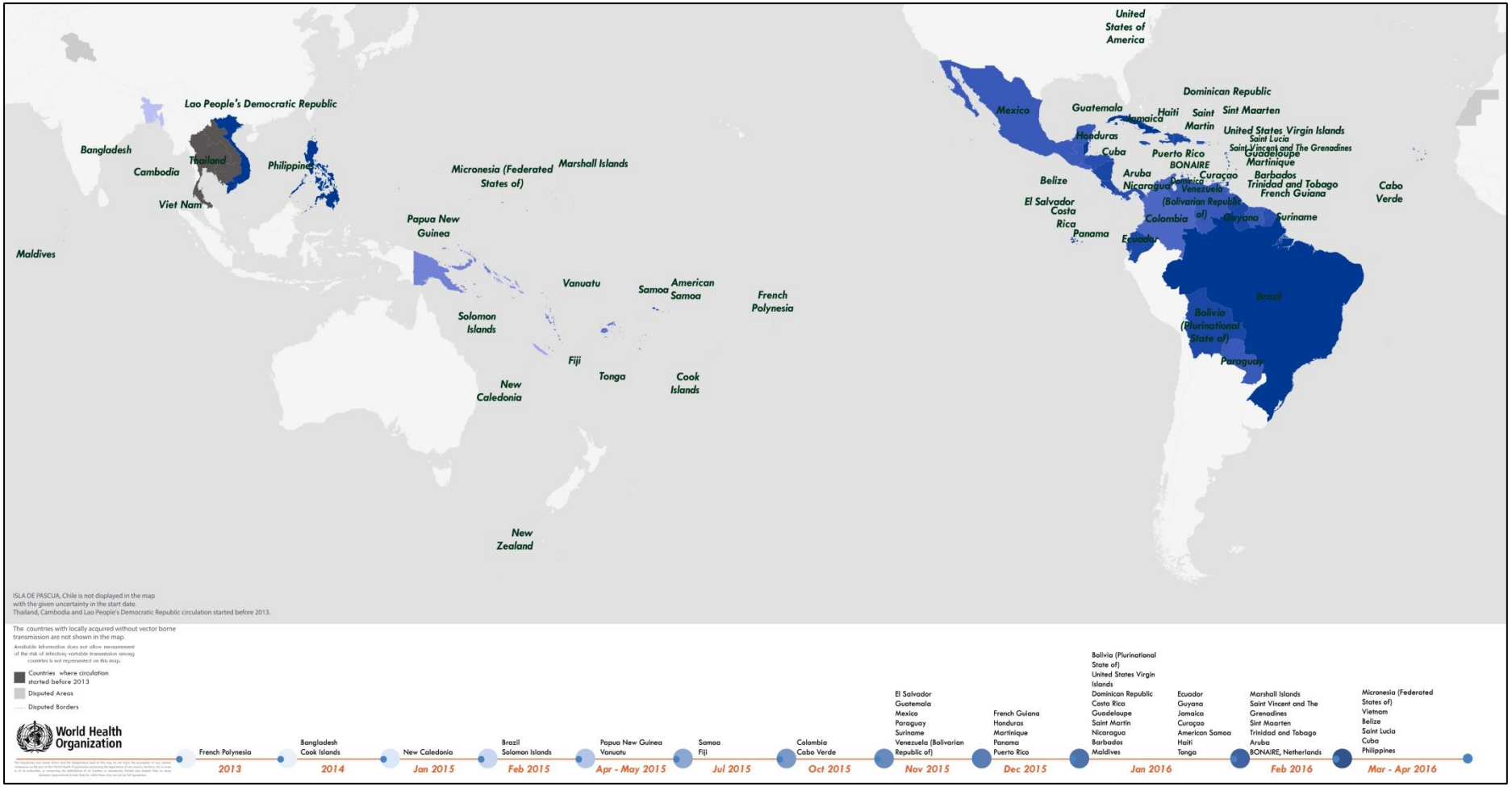
- ***Category 1. Countries experiencing a first outbreak of Zika virus, with no previous evidence of circulation, and with ongoing transmission by mosquitos:*** *countries where Zika virus has recently been introduced, with no evidence of circulation in the past and where there is ongoing transmission. These countries present a high risk of Guillain-Barré syndrome, microcephaly and other neurological disorders associated with Zika virus.*
- ***Category 2. Countries where there is evidence of Zika virus transmission prior to 2015, with or without ongoing transmission or where the outbreak is reported to be over:*** *this group includes countries that are not experiencing a first outbreak and where transmission has occurred at low levels in the past, and where transmission may or may not be ongoing or countries that have reported an outbreak since 2015 that is not over. This table lists countries that have experienced outbreaks after 2007, all countries with evidence of infection prior to 2007 are listed in http://www.who.int/bulletin/online_first/16-171082.pdf*

Table 2. Countries reporting non vector-borne Zika virus transmission

Classification	WHO Regional Office	Country / territory / area	Total
Countries with evidence of person-to-person transmission of Zika virus, other than mosquito-borne transmission	**AMRO/PAHO**	Argentina, Chile, Peru, United States of America	**4**
	EURO	France, Italy, Portugal	**3**
	WPRO	New Zealand	**1**
Total			**8**

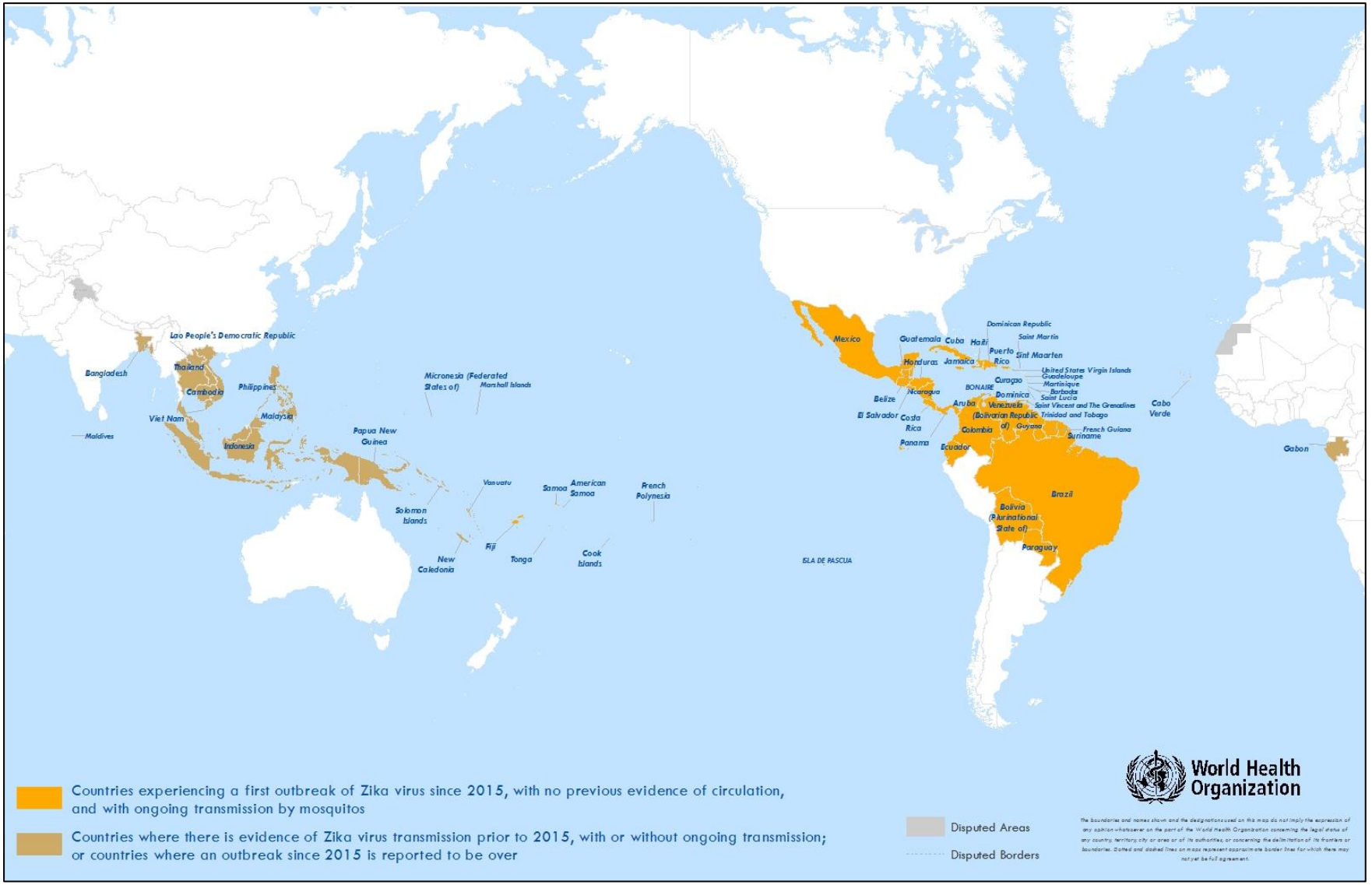
[2] http://www.ins.gov.co/boletin-epidemiologico/Boletn%20Epidemiolgico/2016%20Bolet%C3%ADn%20epidemiol%C3%B3gico%20semana%2014.pdf

Figure 2. Distribution of Zika virus, 2013-2016



ISLA DE PASCUA –Chile is not displayed in the map given the uncertainty in the start date. Circulation of Zika virus in Thailand, Cambodia and Lao People's Democratic Republic started before 2013. Countries where sexual transmission occurred are not represented in this map. Available information does not permit measurement of the risk of infection in any country; the variation in transmission intensity among countries is therefore NOT represented on this map. Zika virus is not necessarily present throughout the countries/territories shaded in this map

Figure 3. Countries, territories and areas reporting Zika virus, 2007-2016.



**These reports do not exclude the possibility that Zika virus is present in other countries, notably in Africa and Asia.*

- From 2007, locally acquired Zika virus cases have been reported in 17 countries and territories in the Western Pacific Region. In addition, one instance of sexual transmission in New Zealand has been reported. Ten of these countries and areas have reported mosquito-borne Zika virus infections in 2016 (American Samoa, Fiji, Marshall Islands, Micronesia (Federated States of), New Caledonia, Papua New Guinea, Philippines, Samoa, Tonga and Viet Nam).
- Cabo Verde, in the African Region, has reported that as of 11 April 2016, preliminary analysis of the 878 samples from suspected cases of Zika virus disease identified 198 with Zika virus IgM antibodies and 5 were positive for ELISA IgM. A total of 113 pregnant women were tested and found positive for Zika virus by serological and molecular tests.

Incidence of microcephaly

- Microcephaly and/or central nervous system (CNS) malformations potentially associated with Zika virus infection or suggestive of congenital infection have been reported in Brazil (1168 cases), Cabo Verde (two cases), Colombia (seven cases), French Polynesia (eight cases), Martinique (three cases[3]) and Panama (three cases). Two cases, each linked to a stay in Brazil, were detected in Slovenia and the United States of America. A further case, linked to a brief stay in Mexico, Guatemala and Belize during 11th week of gestation was detected in a pregnant woman in the United States of America.
- Between 22 October 2015 and 16 April 2016 a total of 7150 suspected cases of microcephaly and/or central nervous system malformations were reported by Brazil. Of these 7150 cases investigations have been concluded for 3409 and 1168 were suggestive of congenital infection (Table 3).[4]
- These 7150 cases of microcephaly and/or CNS malformations reported in Brazil represent a sharp increase in comparison with the period from 2001 to 2014, when an average of 163 microcephaly cases was recorded nationwide per year.[5]
- Microcephaly and/or CNS malformation cases have been detected throughout Brazil, but the reported increase is concentrated in the northeast region.
- Among the 7150 cases of microcephaly and/or CNS malformation reported in Brazil, 246 child deaths occurred after birth or during pregnancy (including miscarriage or stillbirth); 51 of these had microcephaly and/or CNS malformation suggestive of congenital infection, 165 remain under investigation and 30 were discarded.
- An outbreak of Zika virus in French Polynesia was followed by an increase in the number of CNS malformations in children born between March 2014 and May 2015.[6] A total of 19 cases was reported including eight microcephaly cases during that period. This represents an increase compared to the national average of 0-2 cases per year. A published study estimated the risk to be 95 cases of microcephaly per 10 000 women infected during the first trimester.[7]

[3] Two microcephaly cases and one fetal malformation.
[4] http://portalsaude.saude.gov.br/index.php/cidadao/principal/agencia-saude/23326-microcefalia-1-168-casos-foram-confirmados-em-todo-o-pais
[5] http://www.cdc.gov/mmwr/volumes/65/wr/mm6509e2er.htm?s_cid=mm6509e2er_w
[6] http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)00651-6.pdf
[7] http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(16)00651-6.pdf

Figure 4. Distribution of microcephaly and /or CNS malformation cases suggestive of congenital infections

Table 3. Countries, territories and areas reporting microcephaly and /or CNS malformation cases potentially associated with Zika virus infection.

Reporting country	Number of microcephaly and /or CNS malformation cases suggestive of congenital infections or potentially associated with a Zika virus infection	Probable location of infection
Brazil	1168	Brazil
Cabo Verde	2	Cabo Verde
Colombia	7	Colombia
French Polynesia	8	French Polynesia
Martinique	3	Martinique
Panama	3	Panama
Slovenia[8]	1	Brazil
United States of America[9, 10]	2	Brazil; Mexico, Belize or Guatemala (undetermined)

- In the context of the Cabo Verde Zika virus outbreak, two microcephaly cases were reported. For the first case, samples from both the mother and the infant exhibited anti-Zika virus IgG antibodies confirmed by seroneutralization, while for the second case preliminary test of the woman's serum yielded positive results for Zika virus IgM antibodies.
- On 30 March, Colombia reported 50 live births with microcephaly between 4 January 2016 and 20 March 2016. So far, seven of the investigated cases presented Zika virus positive results by real-time PCR (Table 2).

Incidence of Guillain-Barré syndrome (GBS)

- In the context of Zika virus circulation 13 countries or territories worldwide have reported increased GBS incidence and/or laboratory confirmation of a Zika virus infection among GBS cases (Table 4; Fig. 5).
- Between October 2013 and April 2014, French Polynesia experienced the first Zika virus outbreak ever recorded in the country. During the outbreak, 42 patients were admitted to hospital with GBS. This represents a 20-fold increase in incidence of GBS. A case-control study showed a strong association between Zika infection and GBS.[11]

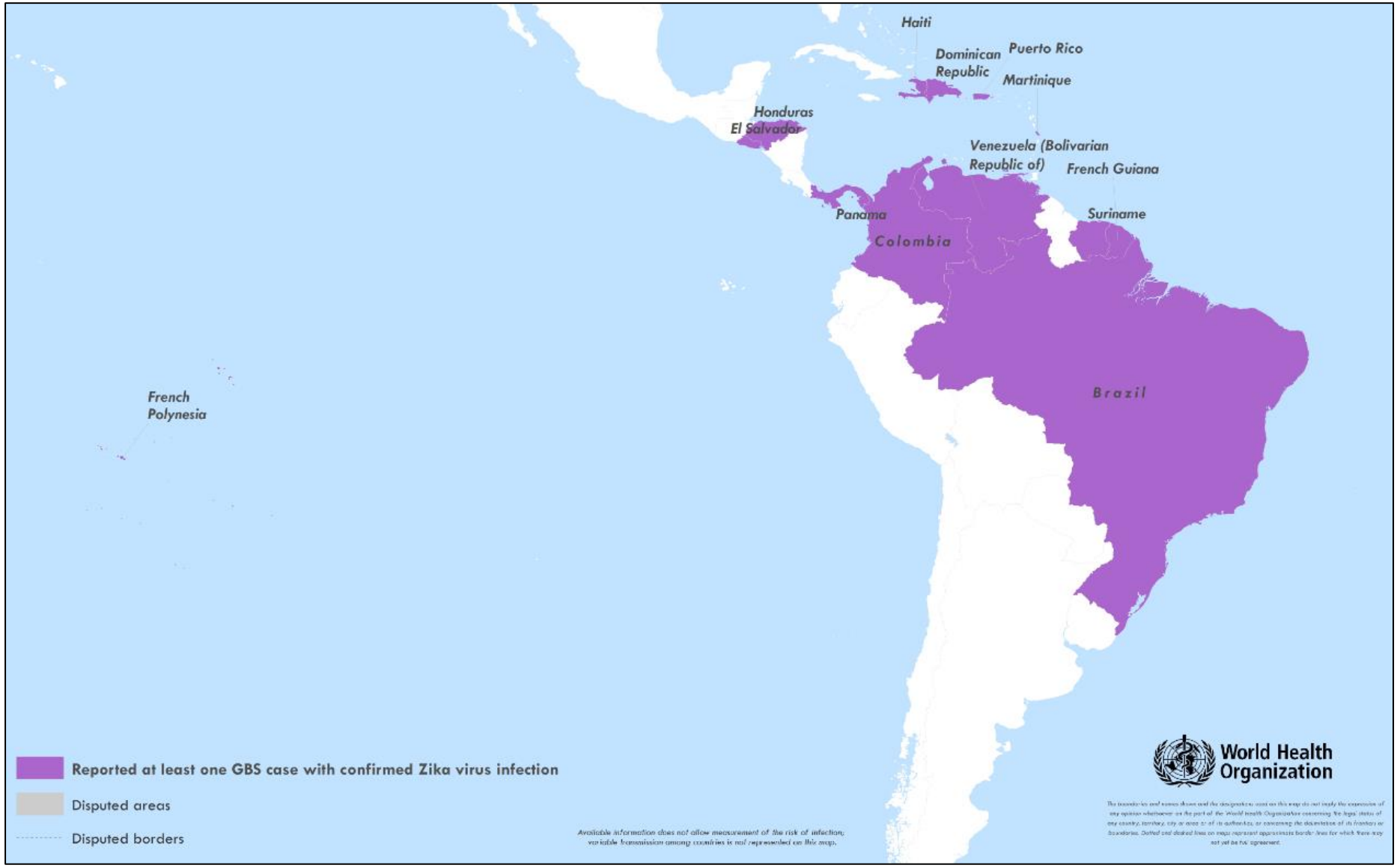
Table 4. Countries, territories or areas reporting Guillain-Barré syndrome (GBS) potentially related to Zika virus infection.

Classification	Country / territory / area
Reported increase in incidence of GBS cases, with at least one GBS case with confirmed Zika virus infection	Brazil, Colombia, Dominican Republic, El Salvador*, French Polynesia, Honduras, Suriname, Venezuela (Bolivarian Republic of)
No increase in GBS incidence reported, with at least one GBS case with confirmed Zika virus infection	French Guiana, Haiti*, Martinique, Panama, Puerto Rico

***** GBS cases with previous history of Zika virus infection were reported by the International Health Regulations (2005) National Focal Point in United States of America

[8] http://www.nejm.org/doi/pdf/10.1056/NEJMoa1600651
[9] http://governor.hawaii.gov/newsroom/doh-news-release-hawaii-department-of-health-receives-confirmation-of-zika-infection-in-baby-born-with-microcephaly/
[10] http://www.nejm.org/doi/full/10.1056/NEJMoa1601824
[11] http://dx.doi.org/10.1016/S0140-6736(16)00562-6

Figure 5. Distribution of reported cases of GBS with confirmed Zika virus infection



- In 2015, 42 GBS cases were reported in the Brazilian state of Bahia, among which 26 (62%) had a history of symptoms consistent with Zika virus infection.[12] A total of 1708 cases of GBS were registered nationwide, representing a 19% increase from 2014.
- From 1 December 2015 to 9 April 2016, Colombia reported 445 cases with neurological syndromes and clinical symptoms of Zika virus infection, of which 298 are GBS cases. In the context of polio surveillance, there has been a report of 39 acute flaccid paralysis cases, in children under 15 years old with a clinical history of Zika virus infection between 14 September 2015 and 19 March 2016.
- El Salvador recorded 178 GBS cases from 5 December 2015 to 22 March 2016, including five deaths, while the annual average number of GBS cases is 169. One GBS case has been laboratory confirmed for Zika virus infection.
- On 29 January 2016, Suriname reported an increased incidence of GBS: 10 GBS cases were reported in 2015 and 9 cases during 2016, while Suriname registers on average approximately four cases GBS per year. A Zika virus infection was confirmed by RT-PCR in three of the GBS cases reported in 2015.
- The Bolivarian Republic of Venezuela has also reported an increased incidence of GBS. Between 12 December 2015 and 18 April 2016, 578 GBS cases were reported, from which 50% presented symptoms consistent with Zika virus infection. In 2016, six GBS cases were confirmed by RT-PCR for Zika virus infection.
- The Dominican Republic has reported 11 GBS cases with history of Zika-like illness from 1 January to 12 March 2016. Six of these cases are children aged under 15 years and the remaining five are people aged over 50 years. Zika virus infection has been confirmed by RT-PCR in one GBS case.
- GBS cases with laboratory confirmed Zika virus infections were also reported from French Guiana (two cases), Haiti (one case), Honduras (one case), Martinique (six cases), Panama (two cases) and Puerto Rico (one case).
- Two reports, published in March 2016, describe other neurological disorders associated with Zika virus infection: a 15-year-old girl in Guadeloupe who developed an acute myelitis,[13] a disorder caused by inflammation of the spinal cord, and in an 81-year-old man a case of meningoencephalitis, an inflammatory process involving both the brain and meninges.[14] These reports highlight the need to better understand the range of neurological disorders associated with Zika virus infection.
- Based on a growing body of research, there is scientific consensus that Zika virus is a cause of microcephaly and GBS.[15, 16, 17]

[12] http://apps.who.int/ihr/eventinformation/bulletin/31523-event-update-2015-07-17
[13] http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)00644-9/fulltext
[14] http://www.nejm.org/doi/full/10.1056/NEJMc1602964?query=featured_zika
[15] http://www.nejm.org/doi/full/10.1056/NEJMp1602708
[16] http://www.nejm.org/doi/full/10.1056/NEJMsr1604338
[17] http://www.who.int/mediacentre/factsheets/zika/en/

II. RESPONSE

- Key interventions being undertaken jointly by WHO and international, regional and national partners in response to this public health emergency are laid out in Table 4.
- WHO and partners are working together on a combination of activities within six main areas of work; coordination, surveillance, care, vector control, risk communication and community engagement, and research at the global, regional and country level.

Table 4. Strategic Response Framework and Joint Operational Response Plan: summary of key response interventions

Objectives	Activities
Public health risk communication and community engagement activities	▪ Coordinate and collaborate with partners on risk communication messaging and community engagement for Zika. ▪ Develop communication and knowledge packs and associated training on Zika virus and all related and evolving issues for communication experts. ▪ Engage communities to communicate risks associated with Zika virus disease and promote vector control, personal protection measures, reduce anxiety, address stigma, and dispel rumours and cultural misperceptions. ▪ Disseminate material on Zika and potentially associated complications for key audiences such as women of reproductive age, pregnant women, health workers, clinicians, and travel and transport sector stakeholders. ▪ Conduct social science research to understand perceptions, attitudes, expectations and behaviours regarding fertility decisions, contraception, abortion, pregnancy care and care of infants with microcephaly and persons with GBS. ▪ Support countries to monitor impact of risk communications.
Vector control and personal protection against mosquitoes	▪ Regularly update and disseminate guidelines/recommendations on emergency *Aedes spp*. mosquito control and surveillance. ▪ Support insecticide resistance monitoring activities. ▪ Support countries in vector surveillance and control, including provision of equipment, insecticides, personal protection equipment (PPE) and training.
Care for those affected and advice for their caregivers	▪ Assess and support existing capacity and needs for health system strengthening, particularly around antenatal, birth and postnatal care, neurological and mental health services, and contraception and safe abortion. ▪ Map access barriers limiting women's capacity to protect themselves against unintended pregnancy. ▪ Develop guidance for: families affected by microcephaly, GBS or other neurological conditions; women suspected or confirmed to have Zika virus infection, including women wanting to get pregnant, pregnant women and women who are breastfeeding; health workers on Zika virus health care, blood transfusion services, tools for triage of suspected Zika virus, chikungunya and dengue cases; and for health services management following a Zika virus outbreak. ▪ Provide technical support to countries on health service delivery refinements and national level planning to support anticipated increases in service needs. ▪ Procure and provide equipment and supplies to prepare their healthcare facilities in provision of specialized care for complications of Zika virus for prioritized countries.

- WHO, in collaboration with Zika response partners, has developed a Knowledge Attitude and Practices (KAP) survey resource pack as part of the Zika Strategic Response Framework. The resource pack is intended to be used by affected and at-risk countries, WHO, UN agencies and NGOs who plan to conduct KAP surveys in a community setting with adult respondents. It provides a bank of key questions in the domains of knowledge, attitudes and practices. It is intended that partners will identify key areas for

investigation according to their operational priorities, select the most relevant questions and update them to reflect national and sub-national contexts. WHO will also coordinate the mapping of operational research on community perceptions and needs as results from the KAP surveys become available. The resource pack is currently available in English and it is being translated into Spanish and Portuguese.

- WHO has developed new advice and information on diverse topics in the context of Zika virus.[18] WHO's latest information materials, news and resources to support risk communication, and community engagement are available online.[19]

III. RESEARCH

- Public health research is critical for establishing the causal link between Zika virus infection in pregnant women and congenital abnormalities in their babies and for understanding the pathogenesis of Zika virus infection. Technical assistance is being coordinated with various partner agencies globally and in affected countries to identify and answer critical questions (Table 5).
- WHO will continue to lead the harmonisation, collection, review and analysis of data.
- Five key priority areas have been defined for public health research:
    1. Establish causality between Zika virus infection and neurological disorders (in fetus, neonates, infants and adults): development of a causality framework and of a systematic review
    2. Risk of adverse outcomes of pregnancy in women infected with Zika virus and follow-up of babies and infants: establish a cohort of pregnant women
    3. Explore sexual transmission of Zika virus: establish a cohort of men and women and test regularly body fluids for the presence of Zika virus
    4. Vector control research: evaluate interventions based on community and resistance of the vectors, develop surveillance system
    5. Public health system research: evaluate the preparedness of health system to manage babies with microcephaly and assist their families, to manage patients with GBS; to evaluate the availability of contraception in health services to respond to the demand and assess abortion services.

Table 5. Strategic Response Framework and Joint Operational Response Plan: research and development

Objectives	Activities
Fast-track research and development of new products including diagnostics, vaccines and therapeutics.	▪ Identify research gaps. ▪ Support the conduct of research related to Zika virus diagnostics, therapeutics, vaccines and novel vector control approaches ▪ Convene research actors and stakeholders. ▪ Coordinate introduction of products after assessment and evaluation. ▪ Coordinate supportive research activities including regulatory support and data sharing mechanisms.

[18] See resources listed at end of report.
[19] http://www.who.int/risk-communication/zika-virus/en/

Zika virus and potential complications

WHO documents

As of 20 April 2016

World Health Organization

1. Epidemiology and Laboratory

Surveillance

1.1 Zika virus case definition
AR | CH | EN | FR | RU | SP | PT

1.2 Surveillance of Zika virus
AR | CH | EN | FR | RU | SP | PT

1.3 Laboratory testing for Zika virus
AR | CH | EN | FR | RU | SP | PT

2. Management of Complications

2.1 Prevention of potential sexual transmission of Zika virus
AR | CH | EN | FR | RU | SP | PT

2.2 Pregnancy management in the context of Zika virus
AR | CH | EN | FR | RU | SP | PT

2.3 Assessment of infants with microcephaly in the context of Zika virus
AR | CH | EN | FR | RU | SP | PT

2.4 Identification and management of Guillain-Barré syndrome in the context of Zika virus
AR | CH | EN | FR | RU | SP | PT

2.5 Breastfeeding in the context of Zika virus
AR | CH | EN | FR | RU | SP | PT

2.6 Psychosocial support for pregnant women and for families with microcephaly and other neurological complications in the context of Zika virus infection
EN | SP | PT

3. Vector Control

3.1 Monitoring and managing insecticide resistance in Aedes populations
EN

3.2 Entomological surveillance for *Aedes spp.* in the context of Zika virus
EN

3.3 Protecting the occupational health and safety of workers in emergency vector control of Aedes mosquitos
EN | FR | SP | PT |

4. Risk Communication and Community Engagement

4.1 Risk communications for Zika virus
AR | CH | EN | FR | RU | SP | PT

4.2 Knowledge, Attitudes and Practice surveys: Zika virus disease and potential complications
EN | SP | PT

5. Health Systems

5.1 Maintaining a safe and adequate blood supply during Zika virus outbreaks
AR | CH | EN | FR | RU | SP | PT

6. International Health Regulations

6.1 Aircraft disinsection for mosquito control
EN

6.2 Travel health advice on Zika virus
EN

7. General Information

Factsheets

7.1 Zika virus
AR | CH | EN | FR | RU | SP | PT

7.2 Microcephaly
AR | CH | EN | FR | RU | SP

7.3 Guillain-Barré syndrome
AR | CH | EN | FR | RU | SP

General information

7.4 Zika virus and potential complications: Questions and answers
AR | CH | EN | FR | RU | SP

7.5 Zika virus and safe blood supply: Questions and answers
AR | CH | EN | FR | RU | SP

7.6 Dispelling rumours around Zika and microcephaly
AR | CH | EN | FR | RU | SP

7.7 Information for travellers visiting Zika affected countries
AR | CH | EN | FR | RU | SP

7.8 Zika virus: video questions and answers
EN

7.9 Zika Strategic Response Framework & Join Operations Plan
EN

7.10 Zika virus disease timeline
EN

Information on research and data sharing

7.11 WHO involvement in Zika R&D
AR | CH | EN | FR | RU | SP

7.12 Data sharing in public health emergencies: a call to researchers
EN

7.13 Zika Open
EN