Zika Virus Infection

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OUTBREAK/HIGHLIGHTS 2015

Local

- EREID
- Food Poisoning
- Dengue
- tOPV-bOPV Switch

International

- Ebola
- MERS-CoV
- **Zika Virus**

Zika Virus Infection

- Feb 1, 2016 – WHO declared outbreaks of microcephaly and other neurologic abnormalities that may be linked to Zika virus as "**Public Health Emergency of International Concern**"

Zika Virus Infection

- Mosquito-borne arbovirus
- Flavivirus family
- Causes infection that is newly emerging in Western hemisphere
- Clinical manifestations seen in approx. 20%
- Associated with congenital microcephaly & fetal loses in women infected during pregnancy
- Ongoing outbreak in Americas

Zika Virus Infection
Epidemiology

- Occurred in Africa, Southeast Asia, Pacific Islands
- Ongoing outbreak in Americas
- 1st identified in Uganda 1947 in rhesus monkeys
  - Named after Ugandan forest where 1st isolated
  - Spread to SE Asia with sporadic infections

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Timeline – Zika's origin and global spread

1947 – Scientists researching yellow fever in Uganda's Zika Forest identify the virus in a rhesus monkey

↓

1948 – Virus recovered from Aedes africanus mosquito in Zika Forest

↓

1952 – First human cases detected in Uganda and Tanzania

↓

1954 – Virus found in Nigeria

↓

1960s-1980s – Zika detected in mosquitoes and monkeys across equatorial Africa

Source: World Health Organization, Reuters

Timeline – Zika's origin and global spread

1969-1983 – Zika found in equatorial Asia, including India, Indonesia, Malaysia and Pakistan

↓

2007 – Zika spreads from Africa and Asia, first large outbreak on Pacific Island if Yap

↓

2012 – Researchers identify two distinct lineages of the virus, African and Asian

↓

2013-2014 – Zika outbreaks in French Polynesia, Easter Island, the Cook Islands and New Caledonia. Retrospective analysis shows possible link to birth defects and severe neurological complications in babies in French Polynesia

Source: World Health Organization, Reuters

Timeline – Zika's origin and global spread

March 2, 2015 – Brazil reports illness characterized by skin rash in northeastern states

↓

April 29, 2015 – Brazilian samples test positive for Zika

↓

July 17, 2015 – Brazil reports detection of neurologic disorders in newborns associated with history of infection

↓

Oct 5, 2015 – Cape Verde has cases of illness with skin rash

↓

Oct 22, 2015 – Colombia confirms cases of Zika

Source: World Health Organization, Reuters

Timeline – Zika's origin and global spread

Oct 30, 2015 – Brazil reports increase in microcephaly, abnormally small heads, among newborns

↓

Nov 11, 2015 – Brazil declares public health emergency

↓

Nov 2015-Jan 2016 – Cases reported in Suriname, Panama, El Salvador, Mexico, Guatemala, Paraguay, Venezuela, French Guiana, Martinique, Puerto Rico, Guyana, Ecuador, Barbados, Bolivia, Dominican Republic, Nicaragua, Curacao, Jamaica

↓

Feb 1, 2016 – World Health Organization declares a public health emergency of international concern

Source: World Health Organization, Reuters

Timeline – Zika's origin and global spread

Feb 2, 2016 – First case of Zika transmission in United States; local health officials say likely contracted through sex, not mosquito bite

↓

Feb 5, 2016 – Outbreaks confirmed in 33 countries in the Americas

↓

Feb 12, 2016 – World Health Organization says suspected link between Zika and the neurological disorders microcephaly and Guillan-Barre syndrome could be confirmed in weeks

↓

Feb 12, 2016 – Brazil Investigating potential link between Zika infections and 4,314 suspected cases of microcephaly. Of those, 462 confirmed as microcephaly and 41 determined to be linked to virus

Source: World Health Organization, Reuters

Countries Affected

http://www.paho.org/hq/index.php?option=com_content&view=article&id=11585&Itemid=41688&lang=en

Zika Virus Infection
Transmission

- Bite of infected Aedes mosquito
- Maternal-fetal transmission occur
  - Intrauterine transmission
    - Congenital infection
    - Intrapartum transmission from viremic mother to newborn

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Zika Virus Infection
Transmission

- Transmission through breastfeeding not established
  - Benefits of breastfeeding outweigh potential neonatal risks
  - Continue breastfeeding
- Sexual transmission reported
- ZIKV RNA detected in blood, urine, semen, CSF, amniotic fluid & breastmilk

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Zika Virus Infection
Clinical Manifestations

Core Symptoms of Zika Virus Infection	
Fever 37.2^{0}C to 38^{0}C	Muscle and.or joint pain
Itchy maculopapular rash	Weakness
Non-purulent conjunctivitis	Edema of the lower limbs
Headache	
Less Common Symptoms	
Retro-orbital pain	
Vomiting, diarrhea	

Zika Virus Infection
Complications

- Spectrum of outcome associated with infection during pregnancy not fully understood
- Further investigation ongoing
- ZIKV infection confirmed in several infants w/ microcephaly
  - Not known how many are associated with Zika

- Brazilian newborns with microcephaly observed in parallel with current Zika outbreak
  - Mar 2015 – Jan 2016 → > 3500 cases of microcephaly reported
    - 20-fold increase in microcephaly

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Zika Virus Infection
Complications

- Yap Islands of Micronesia in 2007
  - No birth defects reported
- French Polynesia outbreak 2013 – 2014
  - No fetal abnormalities identified initially
  - Retrospective evaluation – 17 cases of microcephaly
- Brain abnormalities in Brazil 2015
  - Microcephaly
  - Intracranial calcification
  - Ventriculomegaly
  - Club foot

- Neuronal migration disorder
- Congenital Contractures
- Macular atrophy

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Zika Virus Infection
Complications

- Guillain Barre Syndrome
  - ↑ rate observed in association with ZIKV infection
  - Direct causal relationship not established
  - Countries reported increase in cases of GBS, in parallel with ongoing Zika virus outbreak
  - Outbreak in French Polynesia (2013 – 2014)
    - 74 patients with neurologic or autoimmune syndromes after symptoms of Zika virus infection
    - 42 classified as GBS

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Zika Virus Infection
Diagnosis

- Suspected in those with relevant epidemiologic exposure within 2 weeks prior to onset of illness and 2 or more of the clinical manifestations
- Confirmed by RT-PCR for viral RNA or serology
  - 7 days after onset of symptoms
    - RT-PCR serum
    - (+) for brief period (3 – 7 days)

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Zika Virus Infection
Diagnosis

- 4 days or more – diagnosis by serologic testing (ZIKV IgM & neutralizing antibody titers ≥ 4-fold higher than dengue)
- Virus-specific neutralizing antibodies is useful
  - Discriminate between cross-reacting antibodies
  - Acute and convalescent sera obtained to detect ↑antibody titer
    - Taken 2 – 3 weeks interval

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Zika Virus Infection
Diagnosis

- Lab testing for asymptomatic pregnant women with exposure and (+) ultrasound findings
  - Serologic testing
- Newborns to be tested for ZIKV infection
  - Born to women who traveled to or resided in an area with ongoing ZIKV transmission during pregnancy that were:
    - Diagnosed with microcephaly or intra-cranial calcifications detected perinatally or at birth
    - Mother (+) or inconclusive test results for ZIKV

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Zika Virus Infection
Diagnosis

- For infants
  - RT-PCR on serum
  - Serology to detect ZIKV-specific IgM & neutralizing antibodies
  - Not established which is reliable → RT-PCR and IgM test both performed
  - PRNT may also be done

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Recommended Clinical Evaluation and Laboratory Testing for Infants with Possible Congenital Zika Virus Infection

- Physical examination – head circumference, length, weight, gestational age
- Evaluation of neurologic abnormalities, dysmorphic features, splenomegaly, hepatomegaly, rash
  - Should be documented
  - Consultation with appropriate specialist if w/abnormality

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Recommended Clinical Evaluation and Laboratory Testing for Infants with Possible Congenital Zika Virus Infection

- Cranial ultrasound
- Evaluation of hearing
- Ophthalmologic Evaluation
- Other evaluations specific to the infants clinical presentation

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For Infants with Microcephaly or Intracranial Calcifications, Additional Evaluation includes the following

- Consultation with geneticist or dysmorphologist
- Consult with Pediatric neurologist
  - Determine appropriate brain imaging and additional evaluation
- Test for other congenital infections
  - Consider consult with Pedia ID
- CBC, platelet count, liver function test
- Consider genetic and other teratogenic causes based on additional congenital anomalies identified

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Pregnant (symptomatic or asymptomatic) woman with history of travel to affected areas

Test for Zika virus infection

Fetal ultrasound to detect microcephaly or intracranial calcificatons

FIndings present

No findings present

Consider amniocentesis for Zika virus testing

Long term follow up

Recommended Clinical Evaluation and Laboratory Testing for Infants with Possible Congenital Zika Virus Infection

- Cranial ultrasound
- Evaluation of hearing
- Ophthalmologic Evaluation
- Other evaluations specific to the infants clinical presentation

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Zika Virus Infection
Management

- No treatment
- Supportive
  - Rest
  - Symptomatic treatment
    - Fluids
    - Paracetamol

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Zika Virus Infection
Prevention

- No vaccine available
- Avoid mosquito bites
  - Personal protection

  - Environmental Control measures

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Pan American Health Organization
World Health Organization
Regional Office for the Americas

Cumulative Zika confirmed and suspected cases reported by countries and territories in the Americas, 2015-2016

Updated as of February 12, 2016

Sub-Region	Country / territory	Confirmed	Suspected	Deaths
North America	Mexico	65	0	0
	Subtotal	**65**	**0**	**0**
Central America	Costa Rica	1	0	0
	El Salvador	3	7,923	0
	Guatemala	105	278	0
	Honduras	2	4,590	0
	Nicaragua	47	0	0
	Panama	42	0	0
	Subtotal	**200**	**12,791**	**0**
Latin Caribbean	Dominican Republic	10	0	0
	French Guiana	88	430	0
	Guadaloupe	17	0	0
	Haiti	5	329	0
	Martinique	12	3,940	0
	Puerto Rico	30	0	0
	Saint Martin	1	0	0
	Subtotal	**163**	**4,699**	**0**
Andean	Bolivia	1	0	0
	Colombia	1,331	24,314	3
	Ecuador	25	0	0
	Venezuela	4	4,696	1
	Subtotal	**1,361**	**29,010**	**4**
South Cone	Brazil	236	70,611	4
	Paraguay	6	0	0
	Subtotal	**242**	**70,611**	**4**
Non Latin Caribbean	Barbados	7	0	0
	Curacao	1	0	0
	Guyana	1	0	0
	Jamaica	1	0	0
	Suriname	6	1,097	4
	United States Virgin Islan..	1	0	0
	Subtotal	**17**	**1,097**	**4**
Total		**2,048**	**118,208**	**12**

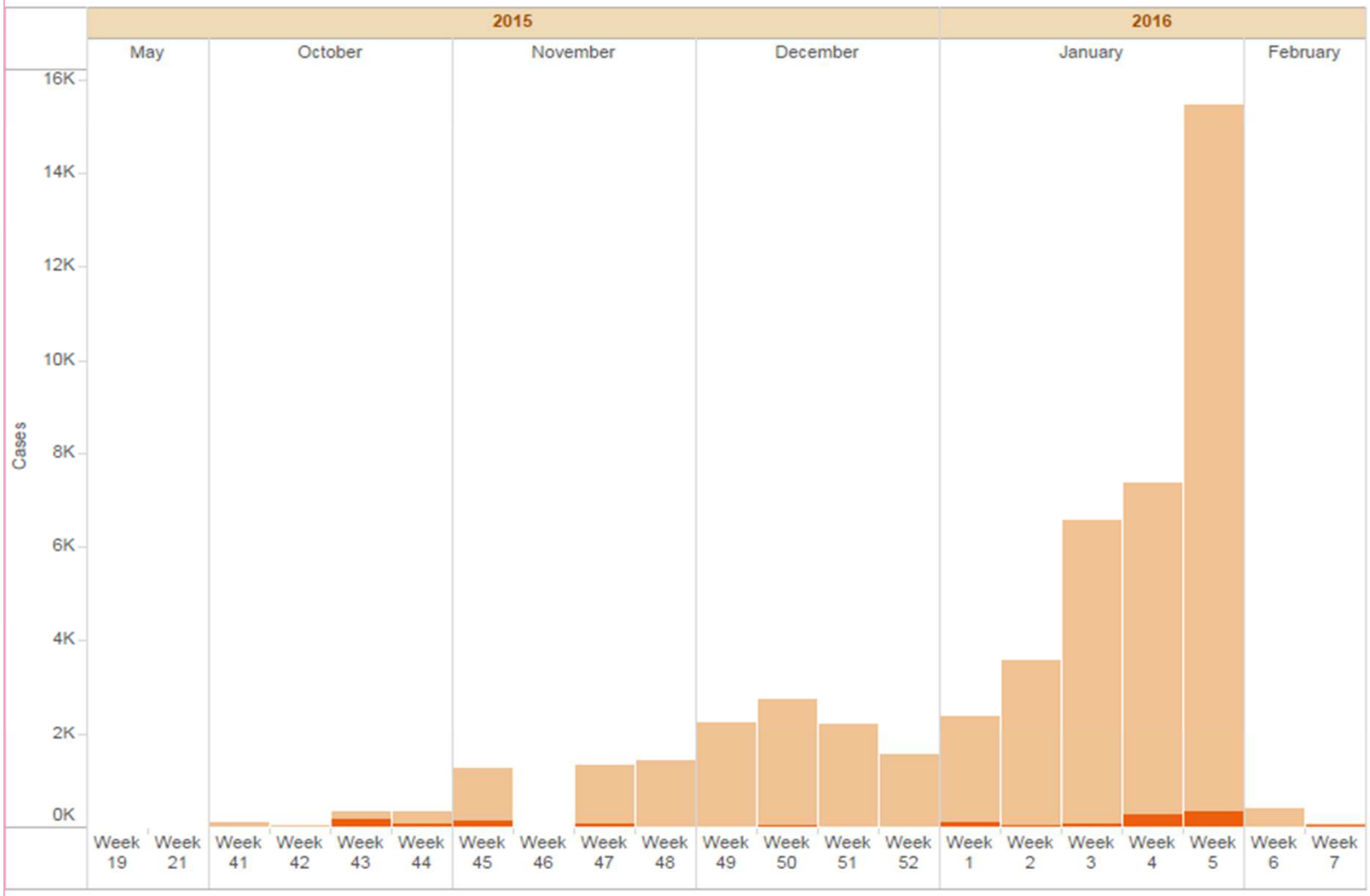
Sources: Cases reported by the IHR National Focal Points to the WHO IHR Regional Contact Point in the Americas and through the Ministry of Health websites, 2016. **Notes:** Deaths correspond to laboratory Zika virus infection confirmed cases. Final cause of death are under investigation. The suspected cases in Brazil are unofficial (media monitoring). Brazil Ministry of Health reported minimum 497.523 and 1,482,701 as maximum estimated cases. Report Available at: http://portalsaude.saude.gov.br/images/pdf/2016/janeiro/22/microcefalia-protocolo-de-vigilancia-e-resposta-v1-3-22jan2016.pdf

Report Production: PAHO/WHO AD CHA IR ARO

Pan American Health Organization
World Health Organization
Regional Office for the Americas

Confirmed and suspected Zika cases reported by countries and territories in the Americas, 2015-2016

(New cases by Epidemiological Week)



Country / territory
All

Sources: Cases reported by the IHR National Focal Points to the WHO IHR Regional Contact Point in the Americas and through the Ministry of Health websites, 2016.
Notes: The suspected cases in Brazil are unofficial (media monitoring). Brazil Ministry of Health reported minimum 497.523 and 1,482,701 as maximum estimated cases.
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Total cumulative cases as of Feb 12, 2016

Confirmed	2,048
Suspected	118,208
Total Cases	120,256


THANK YOU