

Introduction to Chikungunya & Zika

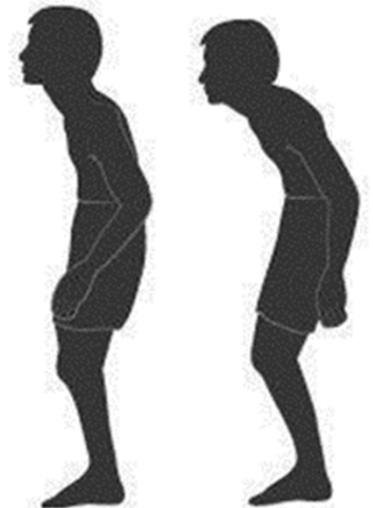


Kim Bautista
Chief of Operations
National Vector Control Program



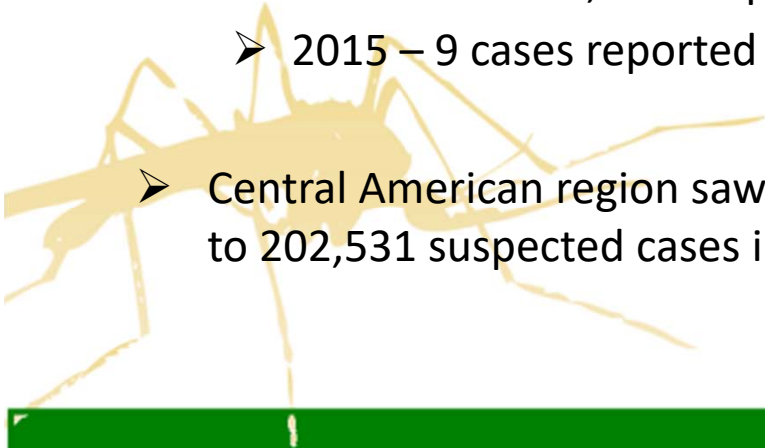
What is Chikungunya?

- Other common names: Chik-V
- Caused by an Alpha Virus is a relatively rare form of viral fever (debilitating non-fatal viral illness)
- Spread by bite of *Aedes aegypti* or *Aedes albopictus* mosquitoes
- Is a Makonde (Tanzania – Africa) word meaning “that which bends up”
- Describes the posture patient assumes to relieve the severe joint pains
- Chikungunya (CHIK) virus first isolated from the serum of a febrile human in Tanzania in 1953.
- Chik-V virus has caused numerous out breaks in Africa and South Eastern Asia, involving hundreds and thousands of people.

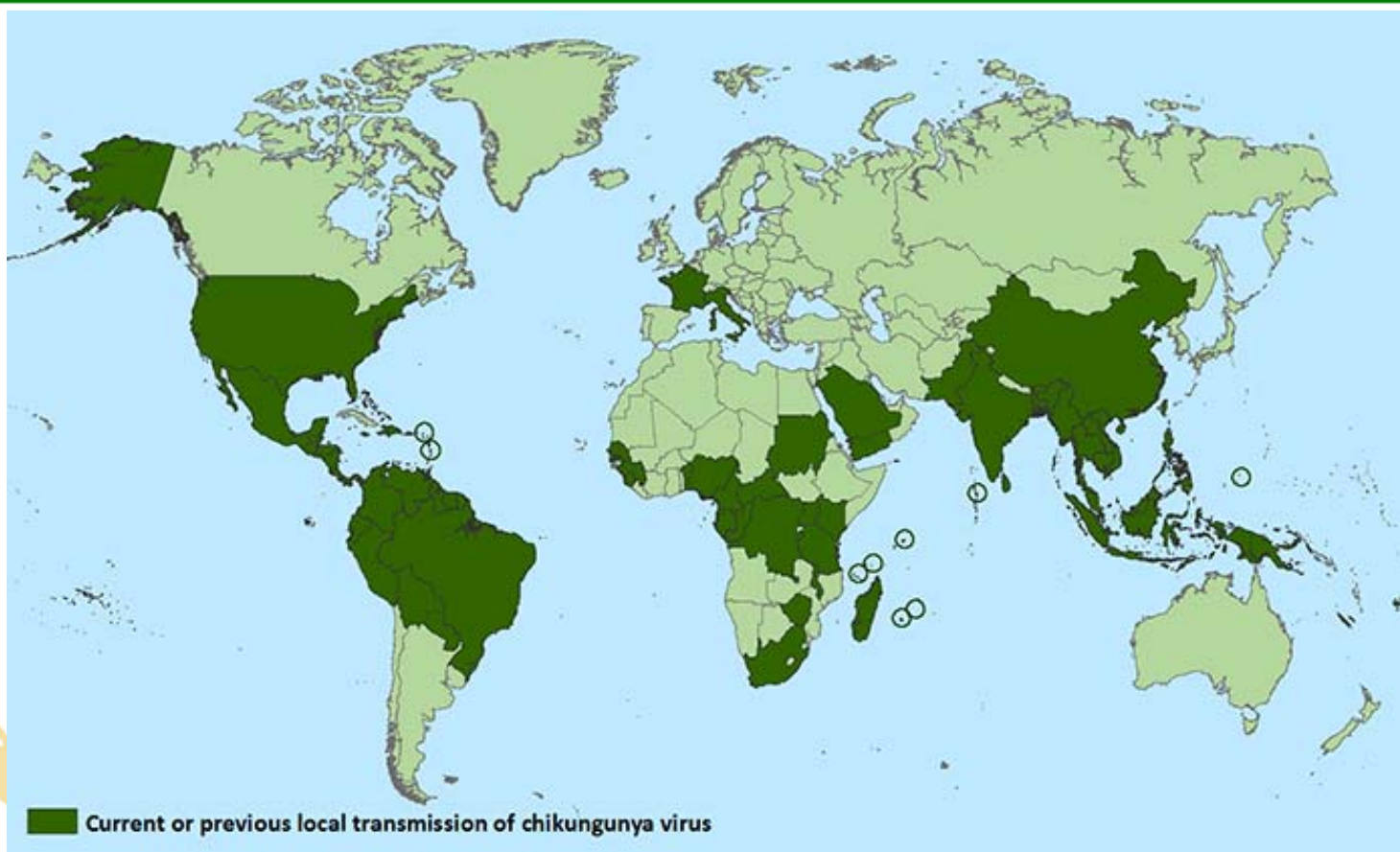


What is Chikungunya?

- A viral infection transmitted to humans by the bite of an infected mosquito
- First outbreak in 1952 on the Makonde Plateau - Border between Tanganyika and Mozambique
- First published report is from Africa in 1955 by Marion Robinson and W.H.R. Lumsden
- Recent large epidemic occurred in Malaysia in 1999
- Belize:
 - 7 cases in 2014, two imported and 6 local.
 - 2015 – 9 cases reported
- Central American region saw an increase from 162,940 suspected cases in 2014 to 202,531 suspected cases in 2015.

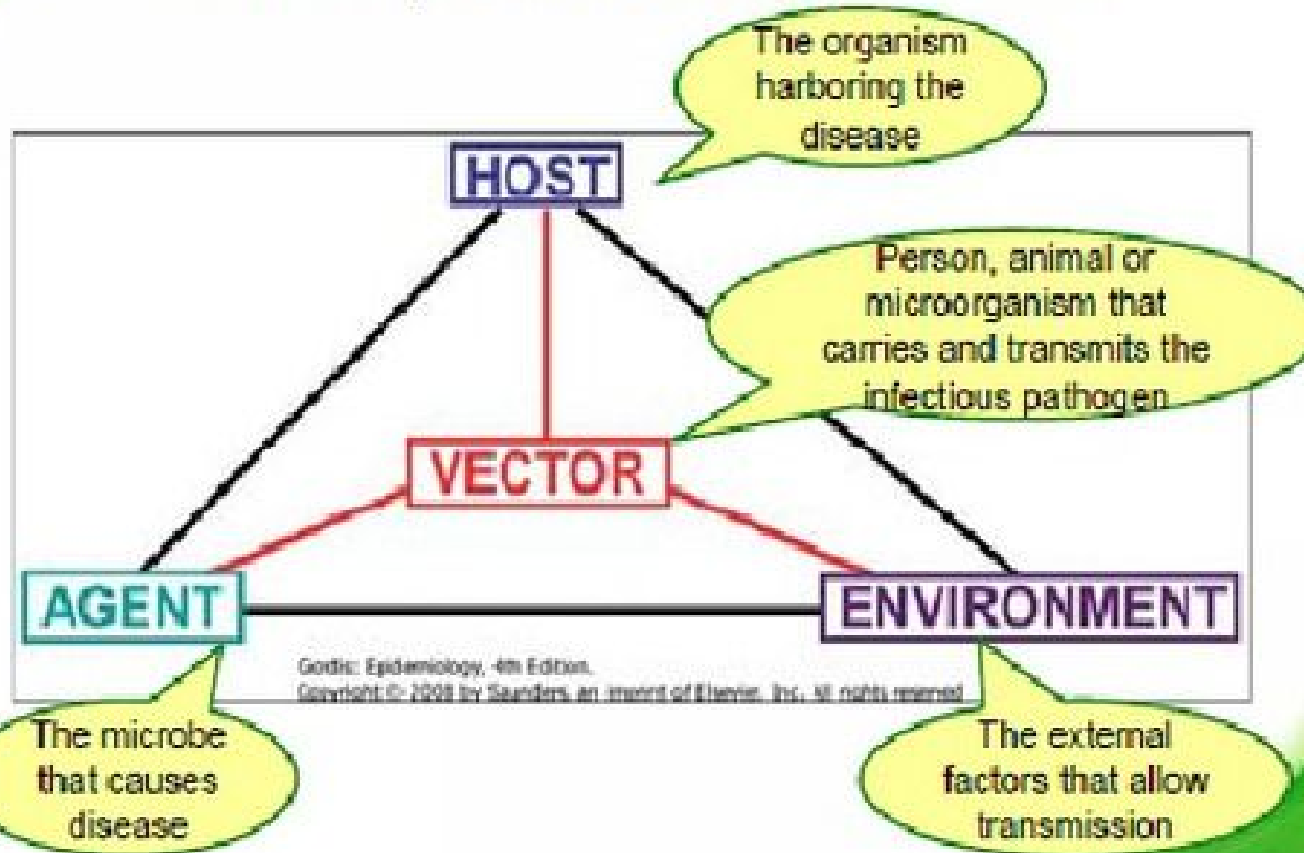


Global Distribution

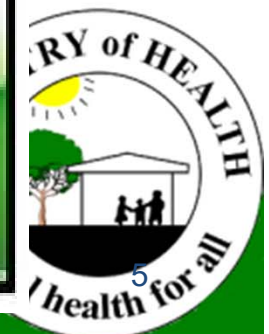


Epidemiological Triangle

The Epidemiologic Triad



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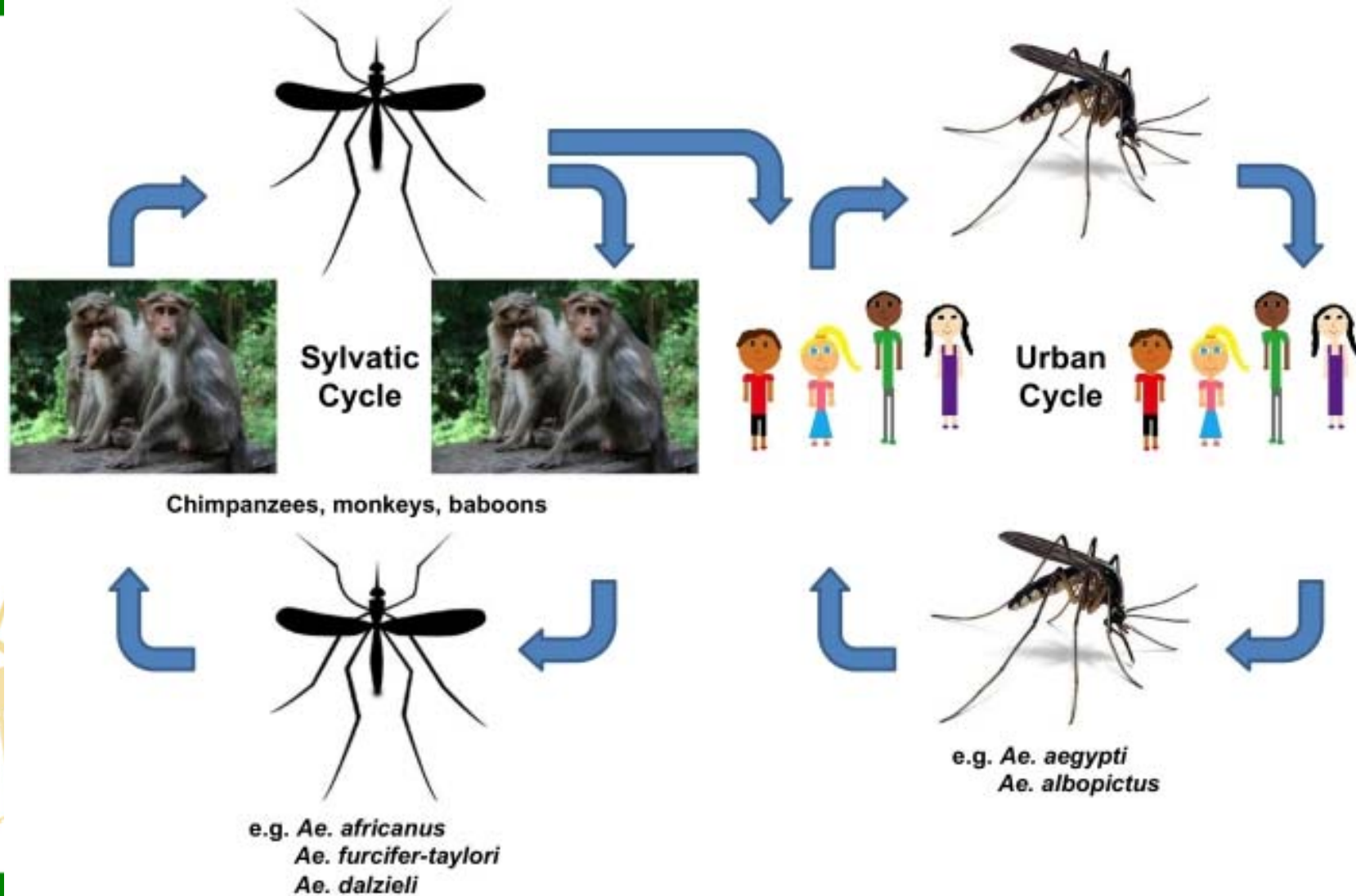


Transmission

- Reservoir – Non-human primates in Africa
- Maintained in nature by man – mosquito – man cycle
- Vector – *Aedes aegypti*, *Ae. albopictus* mosquitoes
- Same vector as for Dengue, Yellow fever, and Zika
- No known mode - other than mosquito bite
- Incubation Period – average of 3 days to 7 days w/ maximum of 1 – 12 days from the mosquito bite
- Rare – blood transfusion, organ/tissue transplant



Transmission Cycle



Distribution of potential CHIK vectors in the Americas

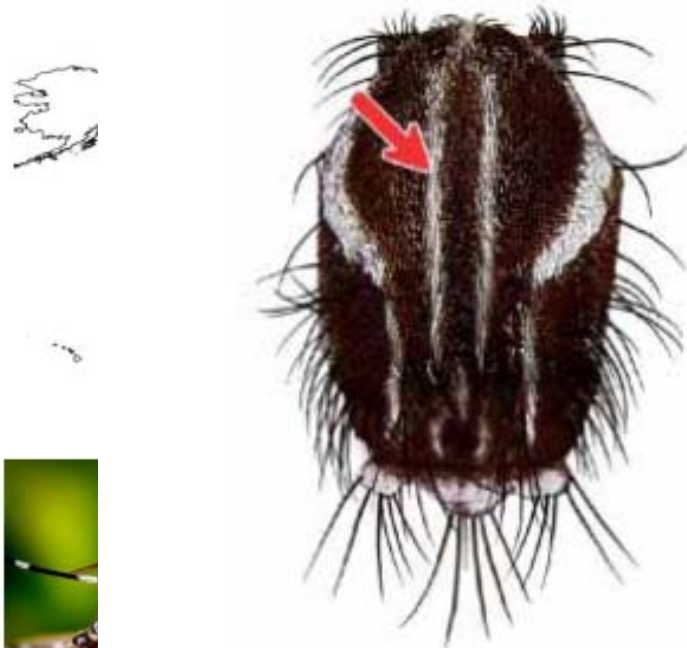


FIGURE 129. *Aedes (Stegomyia) aegypti*.

Aedes aegypti



FIGURE 133. *Aedes (Stegomyia) albopictus*.

Aedes albopictus

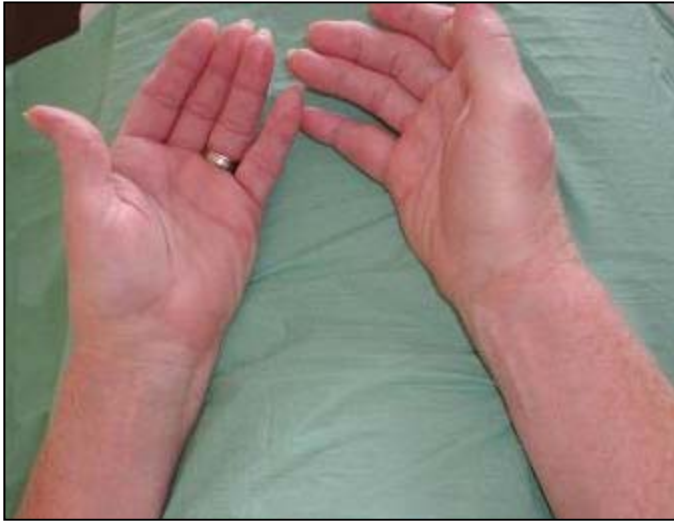
CLINICAL FEATURES

- Sudden onset of fever >38.5 degrees Celsius or 101.3 degrees Fahrenheit
- Severe arthralgia(ankle ,wrist, phalanges)
- Myalgia (muscle pain)
- Chills
- Headache, back pain, retro-orbital pain, conjunctivitis, rash, nausea, vomiting, abdominal pain, severe weakness
- Lasting for period of 7 to 10 days w/ possibility of joint pains lingering for several weeks to several months (Chronic/Severe Arthralgia)











The Contorted Posture



Skin Rash in Dengue CHIKV



Attack Rates

- In urban localities it is more – why ?
- Usual age group is above 15 years
- Less common in children and infants
- Family clustering of cases usual
- Attack rates vary from 3 to 40% of population
- Average attack rate is 10%
- Herd immunity restricts further spread
- Possibility of co-infections with Dengue



Treatment

- There is no specific treatment for CHIKV
- No vaccine or preventive pill is available
- The illness is usually self-limiting (resolves spontaneously without treatment)
- It will resolve with time over a week to 10 days
- No relapses occur – no second attacks
- Symptomatic treatment only



ZIKA



What is Zika?

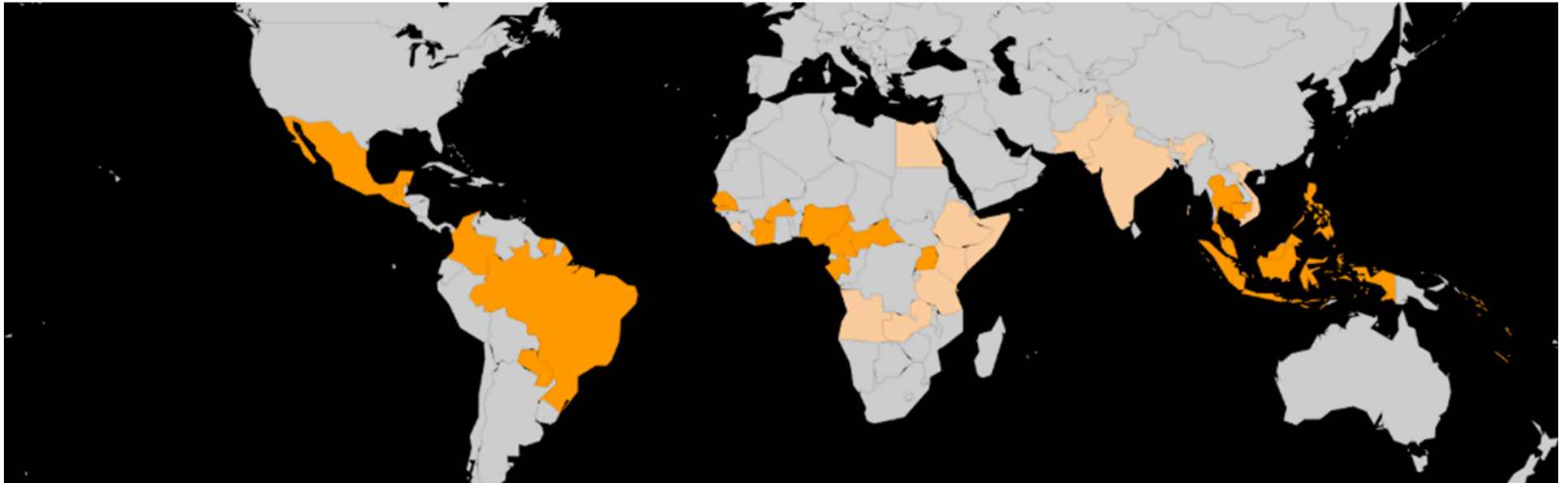
- Also known as Zika-V
- Is a Flavivirus related to Yellow Fever, Dengue, West Nile
- First isolated from a “Rhesus Monkey” in the Zika Forest of Uganda in 1947
- Isolated in humans in 1970's
- Americas & Caribbean – Easter Island – Chile (Feb 2014)
- Brazil – May 2014
- 2015 – 2016: 32 countries in the region



- Genre: Flavivirus
- Primary Vector: Aedes Mosquito (usually bite in the morning and late afternoon/evening hours)
- Reservoir: U



Global Distribution



Regional Distribution

Countries and territories with confirmed cases of Zika virus (autochthonous transmission) in the Americas, 2015-2016.



Updated as of
Epidemiological Week 2
(Jan 10 - 16, 2016)

Legend

Countries with confirmed cases of Zika virus

Orange box: Countries with confirmed cases

White box: Country limits

Caribbean:



Data Source:

Reported from the IHR National Focal Points and through the Ministry of Health websites.

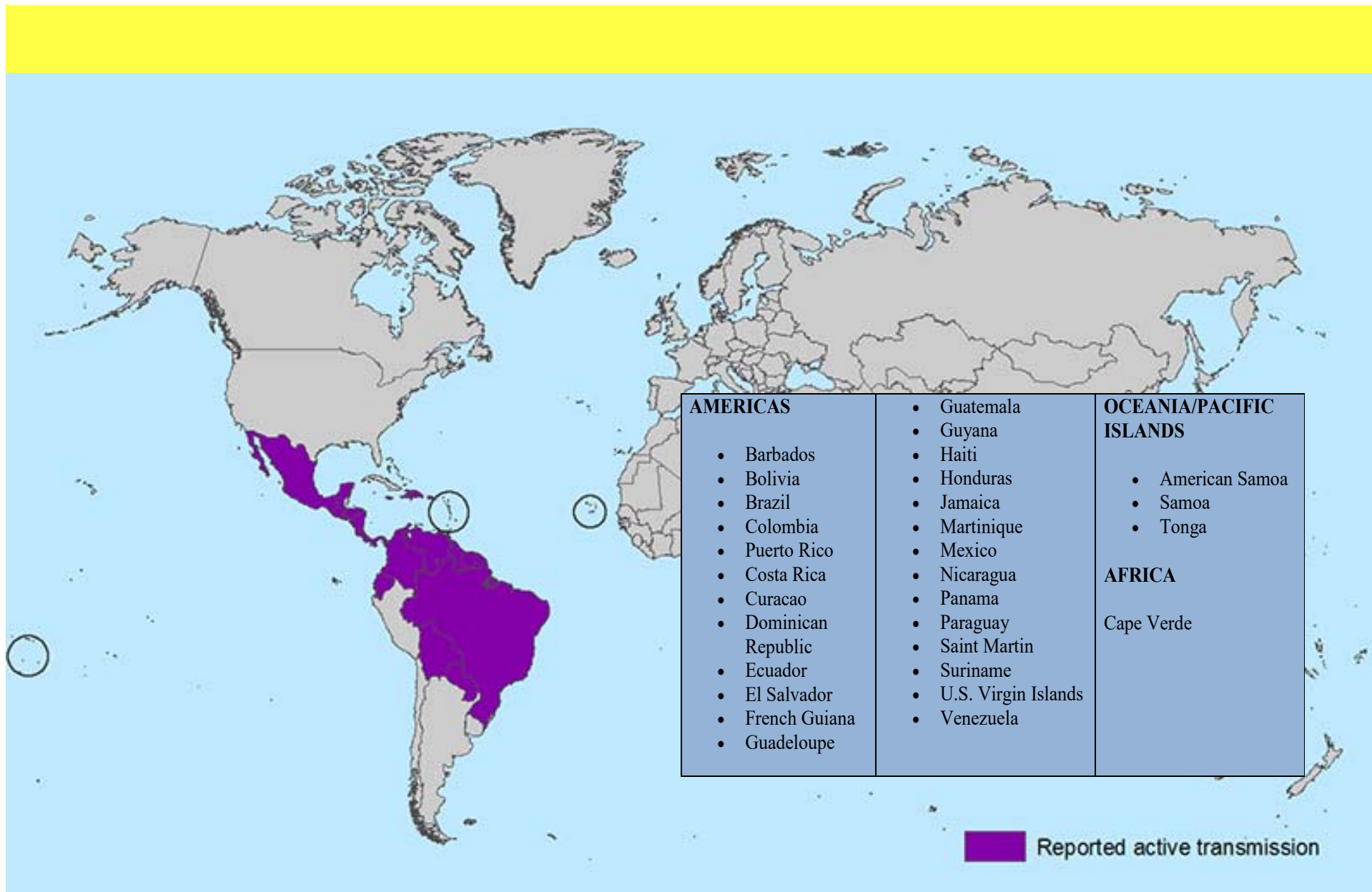
Map Production:

PAHO-WHO AD CHA IR ARO



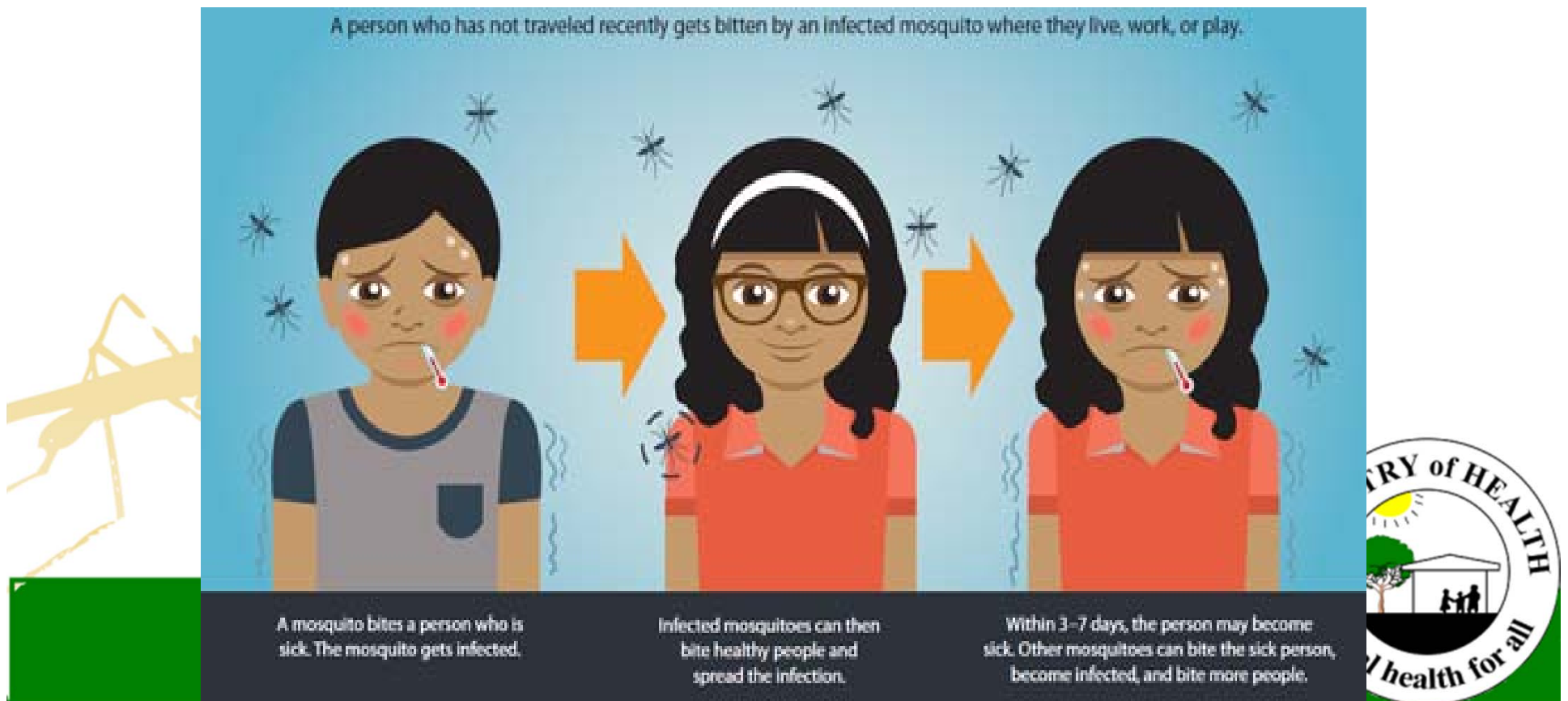
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Transmission

- To individuals through the bite of an infected mosquito (*A. aegypti*)
- Sexually transmitted (Documented case in Dallas, Texas)



Signs/Symptoms

- Incubation period is unclear → 2 – 7 days
- Most cases are self-limited and without symptoms (80% asymptomatic)
- Symptoms similar to other arbovirus and are usually mild



Common Symptoms

The Zika virus

Symptoms

Slight fever
headache

Conjunctivitis

Aching
joints

Heat rash

Muscular pain

General
discomfort

Linked to microcephaly

Abnormally small brain and skull

Placenta

Uterus

Can lead to death in the womb
or neurological disabilities (intellectual
and/or physical) in infants

Aedes aegypti

Vector for:

- Zika
- Dengue
- Yellow fever
- Chikungunya

Size
7 mm



Source: WHO

Photo: Marvin Recinos

AFP



Severe Clinical Features

- Neurological syndromes, including Guillain Barré Syndrome
- Autoimmune syndromes
- Meningoencephalitis
- Congenital Anomalies
- Fisher Syndrome (Miller Fisher Syndrome) is a variant of Guillain-Barre syndrome, characterized by ophthalmoplegia, ataxia and areflexia. These clinical signs can overlap with other signs and symptoms of Guillain-Barre syndrome).



Clinical Features: Zika Virus Compared to Dengue and Chikungunya

Features	Zika	Dengue	Chikungunya
Fever	++	+++	+++
Rash	+++	+	++
Conjunctivitis	++	-	-
Arthralgia	++	+	+++
Myalgia	+	++	+
Headache	+	++	++
Hemorrhage	-	++	-
Shock	-	+	-



Purulent - consisting of, containing, or discharging pus.

Left: non purulent conjunctivitis



Right: purulent conjunctivitis



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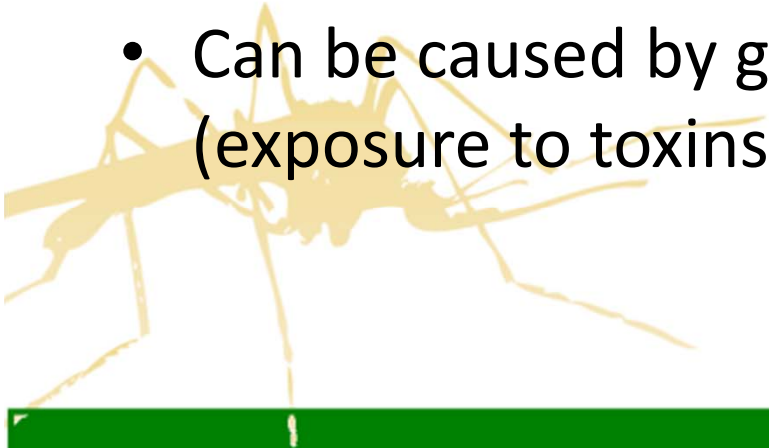
Other Concerns

- Link to microcephaly in newborns as a result of infection of mother during pregnancy
- Microcephaly - abnormal smallness of the head, a congenital condition associated with incomplete brain development.



Microcephaly

- Uncommon condition where a baby's head circumference is less than expected based on the average for their age and sex
- Result of the failure of adequate brain development
- Can be caused by genetic or environmental factors (exposure to toxins, radiation or infections)



Guillain Barré Syndrome

- In its typical form is an acute illness of the nerves that produces lower, bilateral and symmetrical sensorimotor development deficit
- In many cases there is a history of infection prior to developing GBS



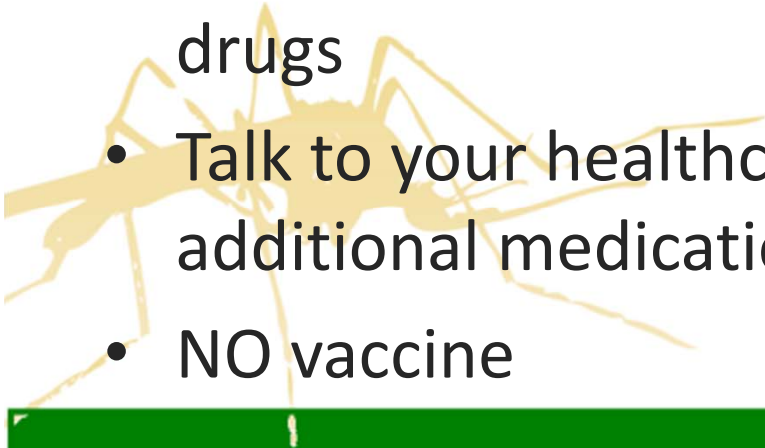
Availability of Testing

- ☐ Not available in country
- ☐ Polymerase Chain Reaction – PCR testing is the “Gold Standard”
- ☐ By serology can be difficult as the virus can cross-react with other viruses
- ☐ Available at referral laboratory – CARPHA
- ☐ Other sources of support: Panama, USA, and Mexico



Treatment

- Zika virus disease is usually mild and requires no specific treatment
- Rest
- Fluids
- Fever, pain reduction: acetaminophen or paracetamol
- NO aspirin or other non-steroidal anti-inflammatory drugs
- Talk to your healthcare provider before taking additional medication
- NO vaccine



New Information

- Very strong link of Zika causing birth defects (the rate is about 1%)
- Transmitted sexually - from male to female only
- Virus remains present in semen for as much as 60 days
- Strong link of Guillain Barré
- Non purulent conjunctivitis is not as common as initially thought
- Fever is short and in most cases between 24 - 48 hours
- Rash - an itchy rash is most common symptom
- Primary concern is Zika in pregnancies due to birth defects, compounded with the fact that the percentage of asymptomatic persons is as high as 80% - then the message to the public needs to be the use of condoms during pregnancy.
- *Culex quinquefasciatus* may also transmit Zika



Why prepare?

- Broad distribution of primary mosquito vectors
- Lack of knowledge of citizens and health care workers on CHIKV
- Frequent travel between Caribbean and CHIK-V endemic countries
- Potential for large outbreaks due to numerous high risk areas for Dengue
- Potential burden on existing health-care system
- Could potentially cripple some sectors



Why prepare?

The image is a screenshot of the Belize tourism website. At the top, a yellow banner contains the text "Why prepare?". Below this is a dark navigation bar with the "belize" logo on the left and a search icon on the right. The navigation bar includes links for "destinations", "things to do", "getting here", "getting around", "facts about belize", and "accommodation". A large red arrow points from the "Why prepare?" text down to the "getting here" link. The main content area features the "belize" logo with a toucan bird integrated into the letter 'i', followed by the tagline "is closer than you think". Below the tagline, a paragraph states: "With daily flights from many cities across North America, getting here is easier than you would imagine. Click below to see which flights are closest to you." A teal button labeled "flights and airlines" is positioned below the text. To the right of the text is a map of Central America with Belize highlighted in teal. Several orange location pins are placed on the map, each connected to a circular orange badge indicating flight duration: 4.5 HOURS, 2.5 HOURS, 3.5 HOURS, 3.5 HOURS, 2 HOURS, and 5 HOURS. The bottom of the page has a green footer with a circular logo on the right that reads "equal health for all" and depicts a tree and people.

belize

destinations things to do getting here getting around facts about belize accommodation

belize
is closer than you think

With daily flights from many cities across North America, getting here is easier than you would imagine. Click below to see which flights are closest to you.

flights and airlines

4.5 HOURS
2.5 HOURS
3.5 HOURS
3.5 HOURS
2 HOURS
5 HOURS

equal health for all

Global Airline Routes



24 Hour Global Air Traffic Simulation



Carnival Cruise Route



➤ Belize is a major tourist destination in the region

➤ 7 major points of entry into Belize

➤ Several un-regulated entry points



Potential Impact of Chikungunya on tourism

- Introduction of Chik-V through tourism is a major risk and can also have an impact on the industry
- In 2013, a total of 677,350 cruise passengers visited Belize.
- Last year Belize recorded 223,510 in PGIA (international airport) arrivals
- The total number of overnight visitors for 2013 was 294,177.
- Tourism accounts for 33% of the jobs in Belize
- World Travel & Tourism Council (WTTC) - travel and tourism netted Belize BZ\$1.2 billion, or 36.6% of GDP, in 2013





Preparedness and Response for Chikungunya Virus Introduction in the Americas in the context of Dengue



Jamaica Workshop (May 2012)

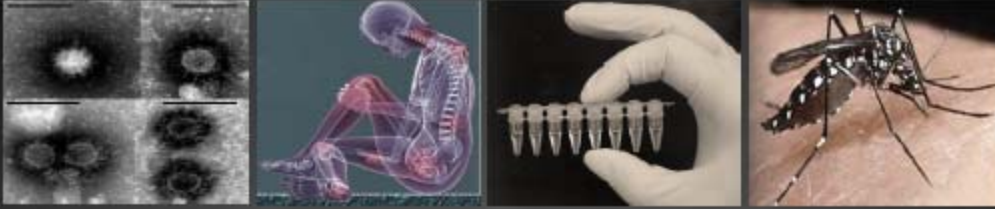
Objectives

- ☐ Discuss potential impact of Chikungunya
- ☐ Build capacity of health system for timely identification of CHIK-V in the context of other epidemic prone diseases such as Dengue
- ☐ Develop Preparedness and Response Plans

Topics

- ☐ Clinical response and case management
- ☐ Laboratory diagnosis
- ☐ Vector surveillance and control
- ☐ Outbreak response





Preparedness and Response Plan for Chikungunya Virus Introduction in the Caribbean sub-region

Prepared by a group of international experts and health professionals at the Chikungunya Caribbean sub-regional meeting in Kingston, Jamaica 2012.



➤ 1st Sensitization meeting with public health officials – 23rd April 2014

➤ Adoption of regional framework

➤ Distribution of material to 4 health regions for training at the local level





MINISTRY OF HEALTH, BELIZE

ZIKA PREPAREDNESS AND RESPONSE PLAN FOR OUTBREAK CONTROL

SURVEILLANCE PLAN

(REVISION 3: 8th February 2016)

BACKGROUND

Given the potential link to neurological syndromes and the increasing amount of overall reported cases of Zika in the region the Pan American Health Organization (PAHO) / World Health Organization (WHO) issued an Epidemiological Alert recommending that Member States establish and maintain the capacity for detection and confirmation of Zika virus cases. Member states are urged to increase the surveillance of congenital anomalies, microcephaly, and other neurological and autoimmune syndromes (GBS); and are urged to continue with effective vector control and communication strategies to the public to increase awareness and to reduce the presence of mosquito vectors. Overall prevention measures and vector control strategies are the hallmarks in addressing the Zika epidemic in the region.

PHASE 1: PREPAREDNESS

During the preparedness phase, the strengthening of the epidemiological surveillance system is as

Framework Zika Preparedness & Response Plan

Clinical & Epidemiological Surveillance

- Zika Epidemiological Surveillance system for timely alert and opportune response implemented.

Laboratory Surveillance

- Laboratory capacity is strengthened to support surveillance and outbreak investigation for a timely response to clinicians and public health officials.



Framework Zika Preparedness & Response Plan

Vector Control

- Integrated Vector management for Zika-V prevention and control implemented to reduce vector populations.

Include:

Develop vector control response and communication plan, describing increasing control activities based on epidemiological situation.



PREPAREDNESS & RESPONSE PHASES

☐ Phase 1

- Preparedness



☐ Phase 1A

- First suspected case

☐ Phase 2

- Established outbreak

☐ Phase 3

- End of the outbreak

☐ Phase 4

- Endemic seasonal transmissions



THE ONGOING RESPONSE



KEEP DRUMS AND WATER HOLDING
CONTAINERS COVERED



GET RID OF UNWANTED THINGS AROUND
YOUR YARD WHICH HOLD WATER



For more information visit your nearest health
facility and converse with your health
professional.

Prepared by the Health Education and
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<https://www.facebook.com/dhsbelize>

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“NOH GET BITE”

HOW TO PREVENT:
DENGUE, CHIKUNGUNYA
&
ZIKA

















Clean Up Campaigns



Clean Up Campaigns



Zika Awareness Campaigns



Conclusion

- Challenge with diagnostic capacity in country for Chikungunya and Zika – result will be delayed detection of Zika
- About only about 20 – 30% of persons tested for dengue are positive – need to test for other viral illnesses
- high risk areas based on infestation of aedes aegypti has remained constant over the past few years – need to take advantage of this
- The uncertainty/fear associated with Zika has seen better collaboration between stakeholders – something which was lacking for dengue prevention
- The emergence of Zika brings to the forefront the urgent need for aedes mosquito control, the opportunity must be seized to build relationships with stakeholders - government ministries and the private sector.



Conclusion

- The importance of fighting this vector collectively must be sold to citizens
- With respect to Zika, the ministry of health is taking the approach of making this a fight against the *aedes aegypti* and *aedes albopictus* mosquitoes – and not necessarily against Zika.
- Dengue is still rampant in many areas of the country and remains fatal – it still is responsible for dozens of deaths regionally.
- **We must remain focused on the vector and the message must be clear – WE EITHER WORK TOGETHER OR CONTINUE TO FACE AN UPHILL STRUGGLE BEING FOUGHT BY JUST OVER 50 FIELD OFFICERS COUNTRYWIDE!**



Preventing the bite



SACK

THE FIRST TIME
ONE OF THEM
SNEEZES,
CUT THE
ROPE



Thank you!