CHIKUNGUNYA, DENGUE AND ZIKA:

EMERGING INFECTIOUS DISEASES AND WHAT YOU SHOULD KNOW
Nothing to Disclose.
OBJECTIVES

• Briefly describe the epidemiology of the three infectious diseases, Chikungunya, Dengue and Zika
• Be able to list the vectors and current geographic spread of each infection
• Be able to discuss the prevention and treatment of each infection
NATURE’S KILLING MACHINE

https://www.youtube.com/watch?v=rD8SmacBUCU
MOSQUITO-BORNE INFECTIONS

- Malaria
- West Nile Virus
- Yellow Fever
- Japanese Encephalitis
- Eastern Equine Encephalitis
- St. Louis Encephalitis
- Dengue Fever
- Chikungunya
- Zika
CHIKUNGUNYA
FROM THE KIMAKONDE LANGUAGE “TO BE CONTORTED”
From the time one is bitten, symptoms appear within a range of 2-12 days with the average being 4-8.
WORLD-WIDE DISTRIBUTION

GLOBAL DISTRIBUTION OF CHIKUNGUNYA VIRUS*

- Countries currently, or previously, with local transmission of the Chikungunya virus
- Islands with local transmission

SOURCE: Centers for Disease Control (CDC) *as of December 2, 2014
CHIKUNGUNYA

- First discovered in 1952 in an outbreak in Tanzania
- The name means “to become contorted” to describe the hunched or stooped appearance of those suffering from arthralgia
CHIKUNGUNYA IN US, 2015

![Map showing Chikungunya cases in the US, 2015](image)

- Dark blue: Locally-acquired cases reported
- Light blue: Travel-associated cases reported

(Reported cases in states highlighted.
- Texas: Locally-acquired cases
- Other states: Travel-associated cases)
# Chikungunya by State 2015

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<tr>
<th>States</th>
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*Additional information available from the Puerto Rico Department of Health at [www.sldc.gov/pr/EndemicSituations/Publishers/PuertoChikungunya.aspx](http://www.sldc.gov/pr/EndemicSituations/Publishers/PuertoChikungunya.aspx)
SIGNS AND SYMPTOMS

• Fever
• Severe joint pain (in areas with Dengue Fever can be misdiagnosed)
• Muscle pain
• Nausea
• Fatigue
• Rash

Diagnosed by typically by enzyme-linked immunosorbent assays (ELISA) testing.
CHIKUNGUNYA

- Can be transmitted to a newborn during the delivery process, however, if a pregnant women contracts it early in pregnancy, immunity will be conveyed to the fetus and newborn for up to a year.
- No cure, only palliative care during the recovery process (fluids, anti-pyretics, analgesics)
- Infection confers life-long immunity
DENGUE FEVER

ALSO KNOW AS "BREAKBONE FEVER"
Symptoms typically last 2-7 days after a bite from an infected mosquito. This is following an incubation period of 4-10 days. Infected patients transmit the virus for 4-5 days with a maximum of 12.
WORLD-WIDE DISTRIBUTION

Distribution of dengue fever

Source: CDC
SIGNS AND SYMPTOMS

- Severe, flu-like illness
- High fever (40°C/104°F)
- Headache
- Pain behind the eyes
- Muscle and joint pain
- Nausea and vomiting
- Swollen glands
- Rash
- Fever
- Joint pain and muscle aches
- Rashes (maculopapular and pruritic)
- Fatigue
- Headaches
- Conjunctivitis
Severe Dengue (Dengue Hemorrhagic Fever) is the leading cause of hospitalization and death in Asian and Latin American countries.

Similar to Yellow Fever, warning signs occur 3-7 days after the initial onset of symptoms and include:
- Decrease in fever
- Severe abdominal pain
- Persistent vomiting
- Bleeding gums.

Without immediate medical care, the patient could then experience plasma leakage, severe bleeding, respiratory distress, organ impairment and ultimately death.
DENGUE

- 4 different serotypes of the virus, thus a person can contract the virus 4 times in a lifetime
- Can be transmitted to the newborn during the delivery process
- Diagnosis is typically through EILSA testing
- No specific treatment but in cases of severe dengue, fluid management and treatment by medical experts can reduce fatalities from 20% to 1%
- A live tetravalent vaccine is now recommended for ages 9-45 living in endemic countries and has been approved for use in Mexico.
ZIKA

NAMED FOR UGANDA’S ZIKA FOREST
The incubation period for Zika is from 3-12 days. Symptoms usually last 2-7 days for mild cases.
ZIKA

- First discovered in 1947 in the Zika forest of Uganda, the first large outbreak occurred in 2007 in the Pacific Island of Yap in Micronesia. 73% of the population was infected.
- In March 2015 Brazil reported an outbreak of 7000 cases.
- From there, it spread throughout South America, Central America and the Caribbean.
WORLD-WIDE DISTRIBUTION

The Spread Of The Zika Virus
Countries and territories with active Zika virus transmission* and reported cases

Reported active transmission
Zika case(s) currently reported
Zika reports prior to 2015

Source: Centers for Disease Control and Prevention
*As of February 2016
ZIKA IN THE UNITED STATES
BURDEN OF INFECTION
SIGNS AND SYMPTOMS

• 80% of cases are asymptomatic
• Fever
• Joint pain and muscle aches
• Rashes (maculopapular and pruritic)
• Fatigue
• Headaches
• Conjunctivitis
COMPLICATIONS OF ZIKA

- The virus can be transmitted during pregnancy and cause congenital brain abnormalities such as microcephaly.
- The virus has also been linked to Guillain-Barré syndrome.
ZIKA

- Infection leads to life-long immunity.
- Testing is done on blood to rule out similar infections such as Dengue and Chikungunya.
- No vaccine currently exists.
- Symptoms are managed with fluids, rest, antipyretics and analgesics. NSAIDS and ASA should be avoided until Dengue is ruled out.
ZIKA VACCINE

• Experimental vaccine has moved into broader human testing phase with sites in Houston, Miami, San Juan Puerto Rico.
• By June, researchers hope to enroll 2400 volunteers into the program from other regions in the Americas.
• The vaccine is to be given in 3 doses, 4 weeks apart and the volunteers will be monitored for up to 2 years for any signs or symptoms of the Zika infection.
• Killed-virus vaccine
# Zika, Dengue, and Chikungunya

<table>
<thead>
<tr>
<th>Zika</th>
<th>Dengue</th>
<th>Chikungunya</th>
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<tbody>
<tr>
<td>Fever</td>
<td>Fever</td>
<td>Fever</td>
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<tr>
<td>Joint pain and muscle aches</td>
<td>Joint pain and muscle aches</td>
<td>Severe joint pain</td>
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<td>Rashes (maculopapular and pruritic)</td>
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<td>Fatigue</td>
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<tr>
<td>Conjunctivitis</td>
<td>Conjunctivitis</td>
<td>Rash</td>
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PREVENTION

COMBATING AN ENEMY
PREVENTING MOSQUITO BITEs

- Wear light colored clothes that cover as much of the body as possible.
- Use physical barriers.
- Use an insect repellent with Deet or picaridin.
- Be mindful that the mosquitoes that carry these infections are active in the day as well as night.
MORE PREVENTION

• Be sure to assist the elderly and cover up young children as well who might be exposed.
• Remove any standing water from the home that might allow mosquitoes to lay eggs.
• Apply sunscreen first, then repellent.
PREVENT THE SPREAD OF ZIKA

• Pregnant or soon to be pregnant women should avoid travel to a Zika endemic area.
• Women who have had a potential exposure to Zika or have been symptomatic should wait 8 weeks until symptoms resolve before trying to conceive.
• Men who have traveled to an endemic country are asked to abstain or wear condoms for at least 6 months following possible exposure to Zika or following symptoms. The virus has been found in semen, 6 months post-infection.
SOURCES

- No Author. Chikungunya virus, Geographic Distribution. www.cdc.gov/chikungunya/geo/index.html
- No Author. Dengue and severe dengue. www.who.int/mediacentre/factsheets/fs117/en/
- No Author. The History of Zika Virus. www.who.int/test/timelines/zika-virus-storymap/