Announcements

- Register for the Epi-Tech Trainings:
  1. Log-on or Request log-on ID/password: https://tiny.army.mil/r/zB8A/CME
  2. Register for Epi-Tech Surveillance Training: https://tiny.army.mil/r/7laAB/EpiTechFY16

- Please enter your name/service and e-mail into the chat box to the left or email the disease epidemiology program at: usarmy.apg.medcom-phc.mbx.disease-epidemiologyprogram13@mail.mil
  - You will receive a confirmation email within the next 48 hours with your attendance record

- Please mute your phones and DO NOT place us on hold. Press *6 to mute/unmute your phone.
Zika Virus
What is Zika Virus?

- Isolated in 1947 from Zika Forrest, Uganda and published in 1952 it was named as an arbovirus in 1957* along with the other often unrelated viruses.

- Arboviruses as a group are not related to each other but are transmitted by arthropods.
- They include *Alphavirus*, *Orbivirus*, *Coltivirus*, *Flavivirus*, and some *Rhabdovirus* among others.
  - Zika virus is in the genus *Flavivirus*, Family Flaviviridae; and
  - This family has some of the most infamous vector borne diseases (e.g., yellow fever, dengue, and tick-borne encephalitis).

- Zika virus is naturally transmitted by *Aedes* mosquitoes primarily in the subgenus *Stegomyia*.

*By William Reeves (that is not me).*
Phylogeny

- Zika virus is not closely related to many of the well known flaviviruses.

- Along with Spondweni virus it is half of the Spondweni serocomplex.

What does this mean?

- Only some antigenic tests cross react and PCR assays designed for Dengue, West Nile, or Yellow Fever viruses are not likely to produce false positives for Zika. Note: Chikungunya virus is not a Flavivirus.
- Most arboviruses are very poorly studied; thus, we know little about them. Zika virus is only slightly better studied than the majority of these viruses.

- Zika infects humans, a few other primates, and a few mosquitoes in the genus *Aedes*.

- We know very little about the possible reservoirs outside of Africa and have little data on the susceptibility of New World monkeys, native mosquitoes, or other wildlife.
Zika Virus Disease

- Most people infected with Zika Virus Disease do not present with symptoms (this is true for the majority of arboviruses).

~10-20% of classic Zika virus infections were mild febrile illness with a fever, rash, yellowing of the eyes and some general feelings of malaise and muscle pain.

Zika Virus Disease was not considered a significant disease for many years and like the vast majority of mosquito borne flaviviruses it was largely ignored.
More About Zika Virus History

- Discovered in Zika Forest in Uganda (1947) and believed to be a monkey virus.

- A few years later it was isolated from sick people in the same region. Note: In a follow up study up to 40% of the people in part of Nigeria were previously infected.

- The virus was soon determined to be endemic throughout much of Africa and later SE Asia.
Zika Virus Outbreak on Yap Island

- The first really large outbreak of Zika Virus reported occurred in 2007 on the Islands of Yap, Fed. States of Micronesia.
- The virus was initially misdiagnosed as dengue.
- In this outbreak over 70% of the population was seropositive.
- Subsequent outbreaks were reported in French Polynesia.

Photo from: Lt Col Mark Duffy
New World 2015-Present

- Zika Virus was discovered in Brazil in 2015 following the Chikungunya and historically large dengue outbreaks.

- Local transmission was suspected and by February 2016 almost every country in the Americas had local transmission.
- A large number of arboviruses are known or strongly suggested of being teratogenic or abortogenic.

  - Many other non-arboviruses have similar properties (e.g. rubella virus, CMV, ...).
  - These are well documented in the veterinary arboviruses.

- Thus the hypothesis that Zika Virus might also have this property is **not novel**.

- There have been similar observations about West Nile virus and numerous endemic *Flavivirus*, *Orthobunyavirus*, *Orbivirus*, and *Alphavirus* strains in the Americas.
In the Americas we have two probable vectors:

- *Aedes aegypti*
- *Aedes albopictus*
Basic Vector Biology

- These mosquitoes evolved to live around and in human structures.
- In the CONUS they have a hard time breeding inside houses; and
- They have relatively short flight ranges (½ mile - the majority don’t even fly ~500 yards).

Third World

VS

Key West, FL
Breeding habitats

Small containers made by people and filled with fresh water.
Not in other places

These species do not breed in large bodies of water (swamps, lakes, saline water or moving water).
Control relies on:
- Cleanup of containers with water;
- Treating with larvicides;
- Personal protection with DEET (or Picaridin);
- Permethrin treated uniforms; and
- Proper uniform wear
Mosquito Control

Note: Sprays must be applied when and where mosquitoes are active so many spraying activities are not effective or even recommended.
Extrinsic Incubation Period

The extrinsic incubation period is the time needed for a MOSQUITO to become infectious after it takes a blood meal.

This is limited by temperature.

At low temperatures mosquitoes often never complete the extrinsic incubation period.
A rapidly changing situation; however, basics will not change:

- Reverse Transcriptase PCR
  ~ 1 week after onset of symptoms

- Immunology
  IgG vs IgM
  Cross Reactions

- Virus isolation
  Zika is a BSL-2

- Fetal tissues (Refer to CDC guidance)
Treatment

- No specific antivirals or vaccines are available.

- There is a general recommendation to avoid the use of NSAIDs because of the possible hemorrhagic complications with dengue or similar viruses.

- Generally treat the signs and symptoms.

- Most patients apparently recover fully in ~2 weeks.

- There are a few reports of sexual transmission.
- Zika virus disease is not currently a reportable medical event (RME) in DoD, but it is a disease of concern.

- Laboratory confirmed cases should be reported in DRSi as "Any Other Unusual Condition Not Listed," with "Zika" entered in the comment field along with a pertinent travel history and, in the absence of a pertinent travel history, recent travel by their sexual partners. For female patients, pregnancy status should be recorded.

- Report Zika virus disease to the state and local health departments per local civilian reporting requirements to improve cross-communication and mitigate the risk of local transmission.

- Direct questions on reporting to the appropriate Service-specific public health POCs.
QUESTIONS?
Contact Information

- **Army**: APHC – Disease Epidemiology Program
  Aberdeen Proving Ground – MD
  Comm: (410) 436-7605  DSN: 584-7605
  usarmy.apg.medcom-phc mbx.disease-epidemiologyprogram13@mail.mil

- **Navy**: Contact your cognizant NEPMU
  NEPMU2: COMM: (757) 950-6600; DSN: (312) 377-6600
  Email: usn.hampton-roads.navhospporsva.list.nepmu2norfolk-threatassess@mail.mil
  NEPMU5: COMM: (619) 556-7070; DSN (312) 526-7070
  Email: usn.san-diego.navenpvntmedufive.list.nepmu5-health-surveillance@mail.mil
  NEPMU6: COMM: (808) 471-0237; DSN: (315) 471-0237
  Email: usn.jbphh.navenpvntmedusixhi.list.nepmu6@mail.mil
  Email: NEPMU7@eu.navy.mil

- **Air Force**: Contact your MAJCOM PH or USAFSAM/PHR
  USAFSAM / PHR / Epidemiology Consult Service
  Wright-Patterson AFB, Ohio
  Comm: (937) 938-3207  DSN: 798-3207
  usafsam.phrepservic@us.af.mil