

# Mosquito Borne Diseases – Facts vs Fiction



October 03, 2016

# Mosquito Facts:

- They have been found all over the planet, and can reproduce in virtually any type of natural or man-made water deposit.
  - On mountain peaks
  - In snow pools
  - In mines and caves
  - Even in crab-holes
- They play an important role in our ecosystems in aquatic communities and as a food source in both aquatic and terrestrial food chains.
- They are in the same insect order as flies and gnats
  - There are 167 species of mosquito in the U.S.
  - There are 80 species in Florida

# Mosquito Borne Diseases



- Malaria
  - Caused by a protozoa
  - Carried by the Anopheles mosquito
  - Anti-malarial medication is available if traveling to areas where endemic
- Yellow Fever
  - Occurs only in Africa, South America, and Central America
  - Vaccine is available and is effective in preventing the disease
- Various types of Encephalitis
- Dengue
  - Called break-bone fever because of the severe joint pain it causes.
- Dengue Hemorrhagic Fever
  - A severe form of Dengue which can result in massive bleeding, shock, and death.

# Mosquito Borne Diseases



- Encephalitis:
  - A viral disease that results in an inflammation of the brain and spinal cord.
  - The life cycle of the disease is complex in nature and usually involves mosquitoes and a non-human vertebrate host. Humans can contract the disease when it escapes it's normal life cycle between the mosquito and the natural vertebrate host.
    - St Louis Encephalitis (SLE)
    - Eastern Equine Encephalitis (EEE)
    - Western Equine Encephalitis (WEE)
    - West Nile Virus (WNV)
    - California Encephalitis Group of Viruses (CEV)
  - Monitoring for these diseases often done through placement of sentinel flocks of birds (chickens) and laboratory examination of their blood for presence of the virus
  - Can also be done through laboratory examination of mosquito pools.

# Mosquito Borne Diseases



- Yellow Fever, Chikungunya, Dengue, Zika:
  - They are grouped together because they are transmitted to humans via the same species of mosquito
    - *Aedes aegypti*:
      - The primary vector for all these diseases
      - Also commonly referred to as the Yellow Fever Mosquito, it lays its eggs in shallow containers of water
      - Doesn't travel far from where it breeds (less than 100 yards)
      - Not a strong flier, but is actively biting throughout the day.
  - Unlike the encephalitis cycle where other animal hosts are involved, these diseases are transmitted via mosquitoes among humans.
    - Human is ill with the disease – mosquito receives a blood meal from the infected human – disease develops in the mosquito – infected mosquito bites another human and spreads the infection.

# How bad is it in Florida?



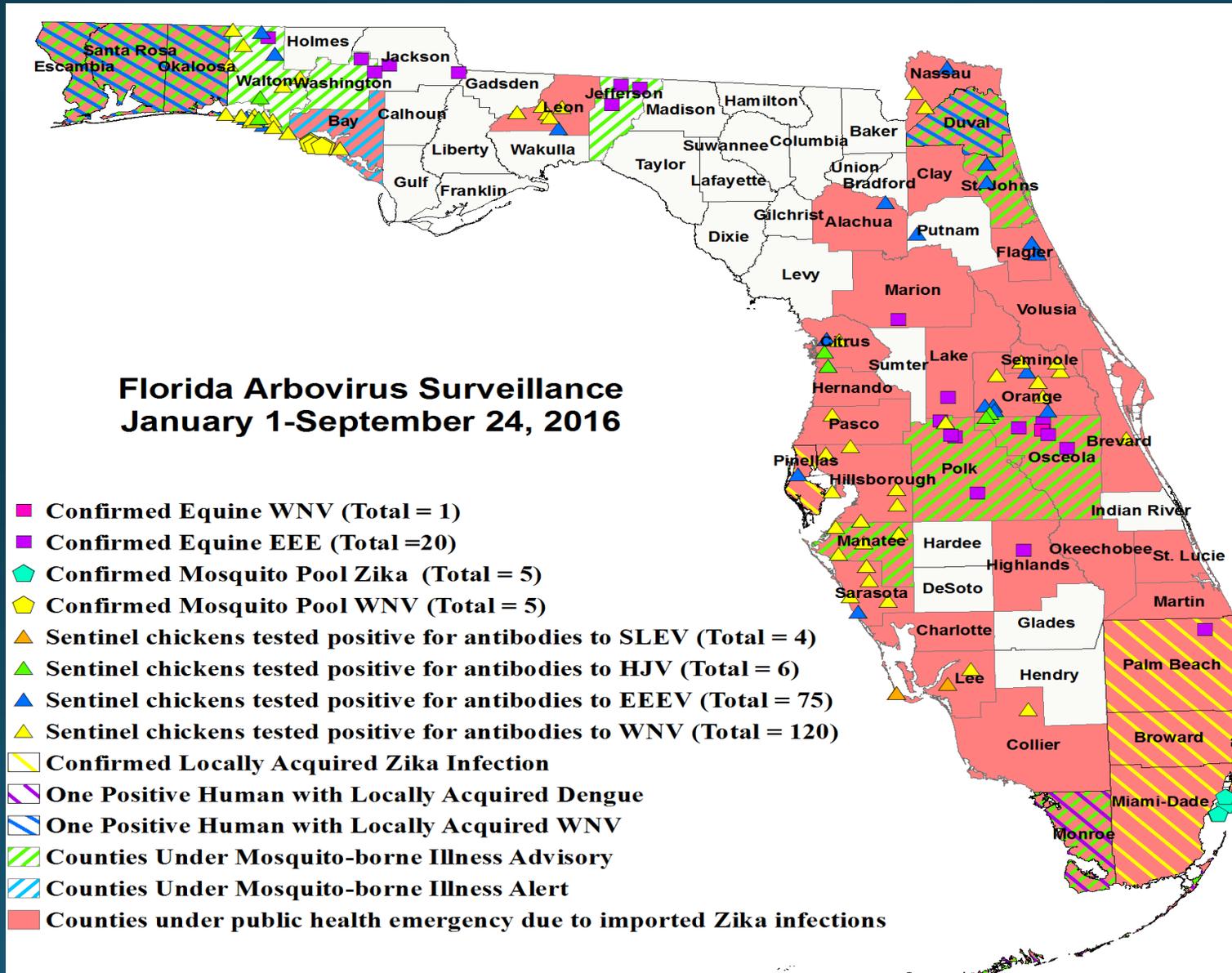
- Zika cases in Florida
  - 948 cases reported
  - Until recently all were acquired from travel outside the U.S.
    - Largest sources of infection were from Puerto Rico (143), Dominican Republic (117), Nicaragua (87), Jamaica (85), Colombia/Brazil (38).
  - 97 cases are in pregnant women
  - 124 cases are locally acquired (not associated with international travel)

- Dengue cases in Florida:
  - 40 cases identified associated with international travel
  - 1 case acquired in Florida (Monroe County/Key West)

- Chikungunya cases in Florida
  - 6 cases and all were associated with international travel



# What does that mean for Florida?



# What does that mean for KSC?

- Fourteen reported Zika cases in Brevard County in 2016.
  - All associated with foreign travel.
- One case of travel associated Dengue in Brevard for 2016
- One sentinel chicken in Brevard identified with West Nile Virus
- Mosquito surveillance continues at the Space Center and at CCAFS.

# What can you do?

- Remove all water holding containers around your property, or at least drain them, cover them, or flush them every two or three days.
- Use natural predator fish in ornamental fountains or ponds.
- Avoid outdoor activities when mosquitoes are most likely to be present and feeding (normally around dusk and dawn).
- Wear protective clothing which includes long sleeves, long pants, and socks.
- Use repellents that contain DEET
- Go to the Florida Department of Health website at [www.floridahealth.gov](http://www.floridahealth.gov)

# Inspect Repellents:

Product Name	Active Ingredient	Protection Time
Off! Deep Woods	23.8% DEET	5 hours
Sawyer Controlled Release	20% DEET	4 hours
Off! Skintastic	6.65% DEET	2 hours
Bite Blocker for Kids	2% Soybean Oil	1.5 hours
Off! Skintastic for Kids	4.75% DEET	1.5 hours

Product Name	Active Ingredient	Protection Time
Skin So Soft Bug Guard Plus	7.5% IR3535	23minutes
Natrapel	10% Citronella	20 minutes
Herbal Armor	12% Citronella 2.5% Peppermint Oil 2% Cedar Oil 1% Lemongrass Oil .5% Geranium Oil	19 minutes
Gone Original Wristband	9.5% DEET	0 minutes
Gone Plus Repelling Wristband	25% Citronella	0 minutes

# Myths

- Bug zappers can control mosquitoes!
  - Not really effective on mosquitoes and can reduce populations of beneficial insects
- Electronic repellents keep mosquitoes away!
  - No, NO, NO!
- Residential vegetation can produce mosquitoes and provides a place for them to nest!
  - Mosquitoes are produced in standing water, not in vegetation. Mosquitoes do not nest. The exception is in bromeliads.
- Bat, owls, and other birds can control mosquitoes!
  - Although they may consume mosquitoes in their diet, they cannot consume them in enough numbers to impact their populations
- Planting citrosa plants on my property will be a deterrent to mosquitoes!
  - While citronella oil has been used as a repellent, the plant does not release these oils, and is therefore not effective as a repellent.
- Spraying to kill adult mosquitoes is the best method of controlling populations!
  - Spraying to kill the adults is the least effective method. Eliminating them before they become adults is the best method.

- KSC Sanitation & Public Health
- Food Safety Inspection Reports
- Facility Sanitation Inspections
- Potable Water Safety
- Florida Animal & Plant Information ▶
- Mosquito, Repellents, Application & Control
- Smoking Cessation Program ▶
- KSC Support Groups ▶
- Helpful Links
- Get Moving Home

## KSC Sanitation & Public Health

### Welcome to the KSC Sanitation & Public Health Web site

The Kennedy Space Center (KSC) Sanitation and Public Health Program (SPHP) synergizes many aspects of KSC to support the health, safety and well-being of the community.

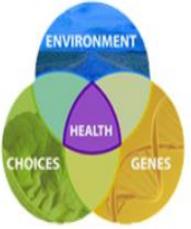


On this web site, you will find information concerning the diverse public and occupational health inspections that occur throughout KSC:

1. Food Establishment Inspection Reports, incl. Catering
2. Facility Health Inspection Reports
3. Animal Care Facility
4. Barbershop
5. Fitness Center
6. Chemical toilets
7. Potable water / coolers
8. Child Development Center

Additionally, the CCAFS mosquito status, the prevalence of regional arboviruses (tick and/or mosquito-borne diseases), as well as other disease trends worth noting, (e.g., rabies, influenza (flu), West Nile virus, and dengue fever) may be presented as required. When warranted, drinking water sampling reports will also be posted.

Supplemental information on relevant health and medical-related issues may also be published as necessary. View the [Public Health Preventive Medicine Connection](#) information.



**An Ounce of PUBLIC HEALTH is Worth a Pound of HEALTH CARE**



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## KSC Sanitation & Public Health

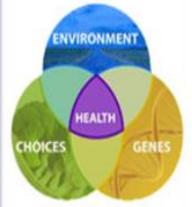
### Mosquitos & Biting Insects

While the risk of contracting a mosquito-borne illness is small, people can reduce their risk of a mosquito-borne illness by adopting the following strategies: staying indoors after dusk as much as possible, reschedule evening activities to an earlier time when appropriate, wear long-sleeved shirts and pants, use mosquito repellants when outside. If your work requires you to be outside in mosquito-infested areas, wear mosquito garments treated with repellent.



### Precautions when Using Insect Repellents

- Apply repellents only to exposed skin or clothing, as directed on the product label. Do not apply repellents under clothing
- Never use repellents over cuts, wounds, or irritated skin
- When using sprays, do not spray directly on face—spray on hands first and then apply to face. Do not apply repellents to eyes or mouth, and apply sparingly around ears
- Wash hands after application to avoid accidental exposure to eyes or ingestion
- Children should not handle repellents. Instead, adults should apply repellents to their own hands first and then gently spread on the child's exposed skin. Avoid applying directly to children's hands
- Use just enough repellent to cover exposed skin or clothing. Heavy application and saturation are generally unnecessary for effectiveness. If biting insects do not respond to a thin film of repellent, apply a bit more
- After returning indoors, wash repellent-treated skin with soap and water or bathe. This is particularly important when repellents are used repeatedly in a day or on consecutive days



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