Mosquito and Vector Control Program

Scott Stanley
Health Education Specialist
“The Division of Environmental Health Services (DEHS) is dedicated to improving the quality of life for all residents and visitors by protecting public health, promoting safety and preventing environmental hazards.”
“The mission of the San Bernardino County Mosquito and Vector Control Program (MVCP) is to protect health and enhance the quality of life of County residents through the suppression of mosquito and other vector transmitted diseases, and the reduction of annoyance levels caused by mosquitoes and other pests of public health importance.”
Mosquito & Vector Control Program

Three Components within the MVCP Program:

- Disease Surveillance
- Operations
- Community Education
Disease Surveillance

Mosquito-borne
- Zika Virus
- West Nile Virus
- St. Louis Equine Encephalitis
- Western Equine Encephalitis
- California Encephalitis
- Dengue
- Chikungunya

Tick-borne
- Lyme Disease
- Rocky Mountain Spotted Fever
- Relapsing Fever

Rodent-borne
- Hantavirus
- Plague
- Arenavirus
Operations

- Abatement of mosquito breeding
- Abatement of bee activity on public property
- Respond to citizen complaints and service requests for community control of vectors
- Sewer treatment
- Vector surveys for property development/demolition
- Tire processing facilities inspections
- Poultry ranch, dairy and equestrian center inspections
ZIKA VIRUS

Aedes aegypti

Aedes albopictus
Zika Virus History

- First detected in 1947, named after the Zika forest in Uganda.
- First human cases of Zika Virus were detected in 1952.
- Outbreaks of Zika have been reported in tropical Africa, Southeast Asia, and the Pacific Islands.
- Before 2007, at least 14 cases of Zika had been documented.
**Zika Virus**

- **Etiology:** Zika virus
- **Symptoms:** most infections are asymptomatic, ~80%
  - fever, rash (pruritic, maculopapular), joint pain, conjunctivitis, muscle pain, headache
  - Death is rare
  - Guillain-Barré syndrome reported following Zika infection, incidence increases with age
- **Incubation period:** unknown, *currently estimated* 3-14 days
- **Infectious period:** found in blood for about a week (longest in literature is 11 days)
  - Found in other bodily fluids such as semen, urine, amniotic fluid, breastmilk
- **Transmission:** mainly through the bite of an infected mosquito (*Aedes*)
  - Mother to child
  - Sexual contact
  - Blood transfusions
Zika Virus

Diagnosis:
- See your provider if you develop symptoms of Zika, and let them know if you recently traveled to an area where Zika is discovered.
- Blood tests for dengue and chikungunya diseases may be ordered, since they can mimic Zika.

Treatment:
- There is no vaccine or medicine to prevent or treat Zika virus.
- Get plenty of rest, drink plenty of fluids, and follow the recommendations of your medical provider.
Zika Virus Cycle

1. ZIKV-Infected Individual
2. Aedes Mosquito Bites Infected Individual
3. Potential for Sexual Transmission
4. Infected Mosquito Bites Another Individual; ZIKV Transmission Event
5. Possible Placental Transmission From Mother to Baby During Pregnancy
6. Microcephaly Risk in Offspring
Zika Virus in infections

As of April 26, 2017 there have been:
- 5264 Zika infections in the US (224 Locally acquired mosquito-borne cases and 4,963 travel-associated cases)
- 77 sexually transmitted/other

As of April 21, 2017 there have been:
- 534 travel associated infections since 2015-2017 in 35 California Counties
- 7 sexually transmitted
- 111 infections in pregnant women
- 5 infants with birth defects

As of April 21, 2017 in San Bernardino County there have been:
- 18 cases (travel related). Zero mosquito to human transmission reported
- Aedes species mosquitoes identified (Colton & Fontana)
Zika Cases Reported in the US, as of 4/19/17
**Zika Virus Transmission: Local Presence of Vectors**

**Aedes aegypti and Aedes albopictus Mosquitoes**

Detection Sites in California

*Updated weekly on Fridays as new infestations are detected*

![Map of California showing detection sites for Aedes aegypti and Aedes albopictus](image)

- **Aedes aegypti**
  - Commerce
  - Pico Rivera
  - Los Angeles
  - East Los Angeles*
  - Maywood
  - Montebello
  - Florence*
  - South Gate
  - La Mirada
  - Hayward
  - Menlo Park
  - Atherton
  - Exeter
  - Clovis
  - Fresno
  - Fowler
  - Sanger
  - Kerman
  - Mendota
  - Madera
  - Madera Ranchos*
  - Parkwood*
  - Santa Ana
  - Huntington Beach
  - Los Alamitos
  - San Jacinto
  - Riverside
  - Imperial Beach
  - Vista
  - Oceanside
  - Escondido
  - San Diego
  - Chula Vista
  - Bonita*
  - Spring Valley*
  - El Cajon
  - Imperial
  - Calexico
  - Heber*
  - El Centro
  - Imperial
  - Andrade*
  - Brawley
  - Holtville
  - Seeley*
  - Montclair
  - Colton
  - Upland
  - South El Monte
  - Duarte
  - Arcadia
  - Temple City
  - Irwindale
  - Monterey Park
  - Baldwin Park
  - Monrovia
  - La Puente
  - Avocado Heights*
  - Rosemead
  - Whittier*
  - Bradbury
  - South Whittier*
  - San Gabriel
  - Azusa
  - Covina
  - West Covina
  - Glendora
  - Los Angeles
  - Alhambra
  - Pico Rivera
  - La Cañada Flintridge

*Unincorporated Census-Designated Places*
Zika Virus Infection Prevention

What is Public Health doing?
• Communicable Disease Section Interviews suspect cases
• When appropriate, arranges for Zika testing
• Symptomatic cases counseled to avoid mosquito bites in 1st week of illness → prevent human-mosquito transmission

Notify Vector Control agencies
• Trap for Aedes vectors
• Check for breeding sites
• Spray local areas
Zika Virus Surveillance

Surveillance

- Prevalence of Zika virus in mosquito samples
- Amount and species of mosquitoes in an area
- Human Cases in area

Methods

- AGO traps, used specifically for the Aedes mosquitoes
- BG traps, used specifically for Aedes mosquitoes seeking blood meal
Zika Virus Operations

Operations

- Education
- Breeding source Abatement
- Physical abatement
- Chemical (LAST RESORT)
WEST NILE VIRUS
West Nile Virus History

- Considered minor risk to humans until 1994 outbreak in Algeria followed by a large scale outbreak in Romania in 1996.
- First detected in the U.S. in 1999 in NY.
- **First detected in CA in 2002.**
WNV Cycle & Incidental Transmission

- **Primary enzootic cycle**
  - Birds
  - Maintenance vector mosquitoes

- **Bridge vector mosquitoes**

- **Incidental hosts**
  - Person to person (blood transfusion, organ transplantation, transplacental transmission possibly via breast milk)

- **Maintenance vector mosquitoes**
West Nile Virus

California as of 4/28/2017

- 1 human case(s) in California

San Bernardino County

- 0 Cases
- 0 Asymptomatic
- 0 WNV
West Nile Virus: Epidemiology

80% asymptomatic (subclinical)

19% West Nile Fever
- Fever, headache, fatigue, muscle pain, malaise, nausea, vomiting, myalgia and rash

1% Neuroinvasive disease
- Type of encephalitis (inflammation of the brain)
- Sometimes permanent neurological damage
- Sometimes death

No vaccine or cure for humans
Disease Surveillance determines:

- Prevalence of WNV in mosquito samples
- Amount of mosquitoes in an area
- Species of mosquitoes in an area

Methods:

- CO2 traps
- Gravid traps
- New Jersey light traps
- Sentinel chicken flocks
- Dead birds
- Human Cases
Mosquito Surveillance and Control Operations

The Primary Methods of Mosquito Surveillance and Control:

- Physical
- Biological
- Chemical
Mosquito Surveillance and Control Operations

Physical Methods

- Education
- Abate breeding source
- Code enforcement
Mosquito Surveillance and Control Operations

Physical Methods

- AGO traps (most successful), used specifically for the *Aedes* mosquitoes
- CO2 traps (most successful)
- BG traps, used specifically for *Aedes* mosquitoes seeking blood meal
- Gravid traps
- New Jersey light traps
Mosquito Control Operations

Biological Methods

- Mosquito Fish
- DEHS provides 2 fish per 12 square feet of water. Location for to obtain mosquito fish (no cost) is the San Bernardino MVCP office. Proof of residency is required.
Mosquito Control Operations

Chemical Methods

- Vectomax FG – Bti Granular formulation dispersed by hand or sprayer
- Altosid Briquettes – Slow-Release juvenile hormone analog, prevents the larvae from reaching adulthood
- Oils – Forms a layer that prevents larvae from reaching the surface for air
- Adultciding - Pyrocide
Mosquito Control Operations Equipment

Operational Equipment

- Truck Sprayers
- Backpack Sprayers
Zika and WNV Personal Prevention

- **DAWN and DUSK** – Avoid spending time outside when mosquitoes are most active.
- **DRESS** – Wear shoes, socks, long pants and long-sleeved shirts that are loose fitting and light colored.
- **DRAIN** – Remove or drain all standing water around your property where mosquitoes lay eggs (birdbaths, ponds, old tires, buckets, clogged gutters or puddles from leaky sprinklers).
- **DEET** – Apply insect repellent containing DEET.
- **DOORS** – Screen doors & windows
- **REPORT** – Report green or neglected pools by calling 1 (800) 442-2283
  - Report dead birds to the state’s WNV toll-free hotline at (877) WNV-BIRD (968-2473) or at www.westnile.ca.gov.
Questions?

“He’s lucky, Mrs. Buzzez – many young bugs experiment with insecticide and never buzz again...”
Scott Stanley
Health Education Specialist II
Scott.Stanley@dph.sbcounty.gov
385 North Arrowhead Ave.
Second Floor
San Bernardino, CA 92415

Mosquito and Vector Control Office
248 South Sierra Way, Unit E
San Bernardino, CA 92408
Fax: (909) 386-5210

800-44-ABATE