Mosquito Borne Diseases
Hazard Analysis, Mitigation, and Response

OKC Office of Emergency Management
Oklahoma City County Health Department

What We Will Cover

- Hazard Profile & Risk
- Vulnerability
- Mitigation Strategy
- Response

HAZARD PROFILE & RISK

Oklahoma City-County Mosquito Viruses

- West Nile Virus (10 cases 2015)
- St. Louis Encephalitis (0 cases 2015)
- Chikungunya Virus (0 cases 2015)
- Dengue Virus (0 cases 2015)
- Zika Virus (No locally acquired case in US continental 48)

These are all mosquito transmitted but have different levels of risk due to disease and prevalence.

Zika

- Is a disease caused by the Zika virus
- Originally discovered in 1947 in Uganda (named after forest in which it was found)
- Transmitted mainly by Aedes species Mosquito
- Human transmission from male to sexual partner
- Symptoms of Zika last for 7-10 days and include fever, rash, reddening of eyes, and joint pain
- No current cure, treat symptoms
- Not life threatening
- Main concern for pregnant women and their unborn babies. Can cause birth defects, much still unknown.

West Nile Virus (WNV)

- Detected in US in 1999
- Transmitted mainly by Culex species Mosquito after feeding from infected bird
- WNV can cause fever, encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord).
- No current cure, treat symptoms
- Can be life threatening
- Concern for all exposed to infected mosquitos

Hospitalization & Deaths in Oklahoma

Year	WNV Non-Fatal Cases	WNV Fatal Cases	Zika	Dengue	Chikungunya
2015	80	7	0	0	0
2014	18	0	0	0	0
2013	75	7	0	0	0
2012	164	13	0	0	0
2011	1	0	0	0	0
2010	1	0	0	0	0

Risk – Drought vs. Wet Years

- Wet years
  - Wash/rinse cycle flushes out the larva
- Drought years
  - Smaller bodies of standing water
  - No wash/rinse cycle occurs

Vulnerability

- Who is vulnerable?
  - Entire population of Oklahoma City
  - Those who play or work outdoors during times when mosquitoes are biting
  - Those who work near potential mosquito habitats
  - The young and the elderly
- No way to predict where and when mosquito borne diseases will occur.

MITIGATION

History

- 2003 - Larvicide
- 2012 - Enhanced Program
- 2013 – WNV added to Hazard Mitigation Plan
- 2016 – Mosquito Borne Disease added to Hazard Mitigation Plan

Mitigation Strategy #1

Conduct personal protection messaging

- "Fight the Bite" uses the 4 D's of mosquito safety:
  - DRAIN
  - DEET
  - DUSK, DAWN, & DAYTIME
  - DRESS
- Websites
  - Providing tips for breeding site reduction, larval control, and adult mosquito control.
  - Links to a safety video
  - FAQ page
- News releases
- Posters

Mitigation Strategy #2

Conduct enhanced surveillance

- Trapping of mosquitos
- Windshield surveys
- Syndromic surveillance

Mitigation Strategy #3

Apply larvacide to mosquito breeding locations

- Through surveillance and testing
- OCCHD and Storm Water Quality (SWQ)
- Use mosquito larvicide to eliminate mosquito breeding sites.
  - Insecticides used to control immature mosquitoes before they have a chance to develop into biting adults.

Mitigation Strategy #4

- Conduct mosquito habitat modification or removal
  - Surveillance, testing, and citizen complaints
  - Collaborative effort
  - Modify, within the scope of their normal assigned areas of responsibility and day-to-day operations
  - Potential habitats in which mosquitoes can develop

Collaborative Partners

- OSDH
- OCCHD
- Development Services – Code Enforcement
- Parks & Recreation
- Public Information & Marketing
- Public Works
  - Storm Water Quality
  - Streets, Traffic, Drainage Maintenance
- Utilities – Solid Waste Management
- Office of Emergency Management

Collaborative Efforts

Solid Waste Management

- Tailgate talks and post advisories to educate our employees about insect bites, stings and diseases including mosquitos.
- Offer employees insect repellent containing DEET.
- Monitor their yard to ensure there is no standing water.
- Illegal Dumping Section removes tires that are illegally dumped throughout the City.

Street, Traffic, Drainage Maintenance

- Tailgate safety meetings to inform crews about procedures to help prevent insect bites, stings and diseases including mosquitos.
- Offer employees insect repellent containing DEET and require crews working in creeks to wear long sleeve clothing .
- Drainage crews trained to report standing water areas within the OKC to SWQ Section to monitor for mosquito infestations.
- CMF yard is monitored to ensure there is no standing water.

RESPONSE

Phases

- Preparation
  - Planning
- Active Biting Season
  - Mitigation strategies
- Traveler Surveillance
- Local Transmission

Traveler Surveillance

- Traveler
  - Traveler to an area with active local transmission
  - Suspicion of exposure
- Health care professional reports it to public health agency
- OCCHD Environmental Specialist conducts a site visit at traveler's residence
  - Looks for possible vector habitat
- Mitigation to reduce or eliminate habitat

Local Transmission

- Defined
  - Traveler infected with a mosquito borne disease not protecting themselves from mosquito bites
  - Gets bitten by a local mosquito
  - Local mosquito then transmits the virus to another person
- OCCHD contractors to perform
  - Residual spraying in homes
  - Habitat spraying around homes
- Mitigation Strategies

Questions?