A COMPREHENSIVE VIEW OF ZIKA VIRUS IN ARIZONA

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RESPONSIBILITIES

- **Monitor** disease activity
- Coordinate field **surveillance** projects
- Disease case investigations
- Rabies **risk assessments**
- Vector **control** activities
- **Education** and public health messaging
- Disease **preparedness** and response activities
- **Collaborative** work with local, state, federal & tribal partners
- Support **One Health** in Arizona
Emerging Zoonoses

• A zoonosis that is newly recognized or newly evolved, or that has occurred previously but shows an increase in incidence or expansion in geographical, host or vector range

• Have potentially serious human health and economic impacts
6 out of 10 infectious diseases in humans are spread from animals.
Globally, 75% of emerging diseases are of zoonotic origin.
What is the most deadly animal in the world?
Threat Assessment:

– Humans: ~475,000 murdered/year
– Snakes: ~50,000
– Dogs: ~25,000
– Sharks/Wolves: <10

– Mosquitoes: ~725,000
World’s Deadliest Animals

Number of people killed by animals per year

- 10 Shark
- 10 Wolf
- 100 Lion
- 100 Elephant
- 500 Hippopotamus
- 1,000 Crocodile
- 2,000 Tapeworm
- 2,500 Ascaris roundworm
- 10,000 Freshwater snail (schistosomiasis)
- 10,000 Assassin bug (Chagas disease)
- 10,000 Tsetse fly (sleeping sickness)
- 25,000 Dog (rabies)
- 50,000 Snake

475,000 Human

725,000 Mosquito
What is Zika virus disease (Zika)?
1947: Discovered in Zika Forest
1947-2006

- Serologic evidence in multiple African & Asian countries
- Only 14 human cases documented
Outbreak in Yap, Micronesia

- Estimated ~75% of population infected
- Only 20% experienced symptoms (~900 people)
2013-2014

Continued spread in the Pacific Islands

- French Polynesia
- New Caledonia
- Cook Islands
- Vanatu
- Fiji
- Solomon Islands
- Easter Island
2015

- Brazil:
  - May: first detected cases
  - May–July: Increase in Guillain-Barre cases in NE states (121 cases)
  - Dec: spread to >18 states
Baby with Typical Head Size

Baby with Microcephaly

Baby with Severe Microcephaly
Zika Globally

As of Oct 26th, 2016

Map showing the global spread of Zika virus transmission as of 23 September 2016.
Case Counts: US

As of Oct 26th, 2016:

• U.S. territories: 28,723 cases
  – Guillain-Barré syndrome: 43
  – Locally-acquired: 28,627

• U.S. States: 4,091 cases
  – Sexually transmitted: 33
  – Guillain-Barré syndrome: 13
  – Locally-acquired: 139
Laboratory-confirmed Zika virus disease cases reported to ArboNET by state or territory — United States, 2015–2016 (as of Oct 26, 2016)
Miami-Dade County, FL. Red shows areas of active transmission where CDC recommends adherence to travel and testing guidance for pregnant women, women of reproductive age, and their partners. Yellow shows areas where CDC recommends cautionary travel recommendations and strict adherence to precautions to prevent mosquito bites.
Case Count: AZ

As of October 28th, 2016:

- Travel-associated cases
  - 45 confirmed
  - 1 probable

46
Zika is a Flavivirus

- Closely related viruses:
  - **Dengue**
  - Yellow fever
  - West Nile
  - St. Louis encephalitis
  - Japanese encephalitis
How is Zika transmitted?

- Zika can be transmitted through:
  - Mosquito bites

Aedes mosquito bites someone infected with the virus. → Aedes mosquito becomes infected and continues to spread the virus. → Aedes mosquito infected with the virus bites healthy people and the cycle continues.
Incubation period in mosquitoes?

May 2016

10
Incubation period in humans?

May 2016

1  2  3  4  5  6  7
8  9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

Notes:
What are the symptoms?

• Only about 1 in 5 people infected with Zika will experience symptoms
What are the symptoms?

- The most common symptoms of Zika are:
  - Fever
  - Rash
  - Joint Pain
  - Conjunctivitis (red eyes)
How does Zika virus affect people?

• Most people who get sick from Zika will experience *mild* symptoms.
• Symptoms go away after about 1 week
• People usually experience immunity after infection
How does Zika virus affect pregnant women?

- Zika virus can pass from a pregnant woman to her fetus during pregnancy and at delivery.
- There have been no reports of the virus spread through breastfeeding.
- Previous Zika infection does not appear to affect future pregnancies.
How does Zika virus affect pregnant women?

- Zika infection in pregnancy is linked to microcephaly.
- Microcephaly: birth defect in which a baby’s head is smaller than expected compared to babies of same age and sex.
• Likelihood that pregnancy may be affected by Zika exposure
• Likelihood that Zika will pass to fetus or that fetus will develop birth defects
• Stage in pregnancy with greatest risk
• Risk if by sexual transmission vs. mosquito-borne transmission
• Other birth defects are possible
• Future pregnancies unlikely to be affected after Zika clears from blood
• Protective immunity
How is Zika diagnosed?

Diagnosis of Zika is based on a person’s recent travel history, symptoms, and results of laboratory tests.
What tests are used to identify Zika?

- RT-PCR tests can identify Zika virus RNA in blood or urine
- Serologic tests can identify Zika virus in blood
- All tests should be coordinated with the appropriate county health department
How is Zika treated?

• There are no vaccines or specific treatment for Zika
• Treat symptoms:
  – Rest
  – Fluids
  – Acetaminophen
What precautions should infected people take?

- Avoid mosquitoes
- Avoid unprotected sex
Which mosquitoes spread Zika?

- *Aedes* species mosquitoes spread Zika
- In Arizona, our Zika risk is from *Aedes aegypti* mosquitoes
What is known about *Aedes* mosquitoes?

- Prefer to feed on humans
- Daytime biters
- Lay eggs in water-holding containers
Where are *Aedes* mosquitoes found?

Estimated range of *Aedes aegypti* in the United States, 2016
Where are *Aedes* mosquitoes found?
How can I keep Myself and My Family Safe?

- Remove standing water around your house and yard.
- Use screens on windows and doors.
- Wear bug spray.
- Protect yourself from mosquitoes all day long.
- Visit your doctor immediately if you feel sick.
- Protect yourself from mosquitoes when traveling to areas with these viruses.
Prevent mosquito breeding

- Mosquitoes breed in all untreated water
- Use intact screens in windows
- Keep yard items covered
- Fix leaky faucets
- Cover refuse containers and junk piles
- Cover items that collect water
- Clean out gutters
- Dump standing water
Keep mosquitoes outside

During mosquito season, keep doors and windows closed or screened to prevent mosquitoes from entering the home.
Dress to protect yourself

Wear long sleeves and long pants to prevent skin exposure to mosquitoes
Wear insect repellent

• Use EPA-registered repellents with one of the following:
  – DEET
  – Picaridin
  – IR535
  – Oil of lemon or eucalyptus
  – Para-menthane-diol

• Follow the label instructions
• Apply sunscreen first
Insect repellent and children

- Do not use insect repellants on babies <2 months old
- Do not use products containing oil of lemon eucalyptus or para-menthane-diol on children <3 years old
- Do not apply onto hands, eyes, mouth, and cut or irritated skin.
- Adults: Spray onto your hands and then apply to a child’s face.
Protect your partner

With a pregnant partner, men who have lived in or traveled to an area with Zika should use condoms the right way, every time; or not have sex during the pregnancy.
Plan your travel

• Pregnant women should postpone travel to areas with active Zika transmission.

• Travelers to Zika-affected areas should:
  – Prevent mosquito bites while traveling
  – Avoid mosquito bites for 3 weeks after they get home
Public Health Response to Zika
CHIKUNGUNYA, DENGUE, or ZIKA: What is an imported case?

A person who was bitten by an infected mosquito while traveling away from home.

A person gets bitten by an infected mosquito while traveling.

Symptoms may begin 3–7 days after being bitten by an infected mosquito.

For more information: www.cdc.gov/chikungunya • www.cdc.gov/dengue • www.cdc.gov/zika
CHIKUNGUNYA, DENGUE, or ZIKA: What is local transmission?

A person who has not traveled recently gets bitten by an infected mosquito where they live, work, or play.

A mosquito bites a person who is sick. The mosquito gets infected.

Infected mosquitoes can then bite healthy people and spread the infection.

Within 3–7 days, the person may become sick. Other mosquitoes can bite the sick person, become infected, and bite more people.
Public Health System Response

CDC

ADHS

Local Health
CDC’s role

• Educate public and healthcare providers
• Post travel notices and guidelines
• Provide guidance to state and local public health
• Support laboratory testing
• Conduct national surveillance
• Implement studies to learn more about Zika
• Support national and international response
ARIZONA ARBOVIRAL HANDBOOK FOR CHIKUNGUNYA, DENGUE, & ZIKA VIRUSES

azhealth.gov/mosquito
## Vector Control Response Plan

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Vector Presence</th>
<th>Vector Abundance</th>
<th>Vector Response / Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Human Case Activity</td>
<td>None</td>
<td>Not Present</td>
<td>None</td>
</tr>
<tr>
<td>No Human Case Activity</td>
<td>Present</td>
<td>High</td>
<td>Increased Aedes aegypti trapping and testing</td>
</tr>
<tr>
<td>Suspect / Probable or Confirmed Human Case (Import Only)</td>
<td>Present</td>
<td>Some Activity</td>
<td>Check historical CO2 trapping records for the presence of Aedes aegypti in the area, increase trapping and testing of mosquitoes in the area surrounding the suspect case with traps designed to collect Aedes aegypti. Will get address of patient from epi and confirm if we have permission to set traps immediately near the house. Will test mosquito for chik/dengue/Zika as possible for PCR and if positive mosquito is found see level 4/5.</td>
</tr>
<tr>
<td>Strong Suspect / Probable / Confirmed Human Case</td>
<td>Vector High</td>
<td>Above Established Thresholds and/or PCR + Mosquito samples</td>
<td>Extensive mosquito trapping and testing of the mosquito population in the neighborhood with traps designed to collect Aedes aegypti. Sample at least 100 meter radius surrounding the suspect/probable/confirmed human case. Placement of lethal ovi-traps and resting boxes in the area, backyard inspections to reduce breeding sites. neighborhood adulticide treatments based on trapping data. Conduct source reduction and/or larviciding as indicated.</td>
</tr>
<tr>
<td>Human Case(s) w/ Evidence of Local Transmission within one or more communities</td>
<td>Present</td>
<td>N/A*</td>
<td>Extensive mosquito trapping and testing of the mosquito population in the neighborhood with traps designed to collect Aedes aegypti surrounding the confirmed human case. Sample at least 100 meter radius surrounding the confirmed human case. Placement of lethal ovi-traps and resting boxes in the area, backyard inspections to reduce breeding sites. neighborhood adulticide treatments, if possible, barrier spraying in the neighborhood.</td>
</tr>
</tbody>
</table>
Maintain Situational Awareness

- Closely follow national and international Zika updates
- Ensure that new information is shared with state and local partners
Monthly Arboviral Work Group

- Enhance communication between epi/vector control partners
- Identify and address arboviral surveillance and response needs
- Strengthen human and mosquito surveillance
- Develop protocols for management of suspect mosquito-borne disease cases
Mosquito Surveillance and Control

- Local vector control departments trap for *Aedes aegypti* mosquitos
- Citizen science projects
- Mosquito control through targeted larvicide and adulticide application
Pregnancy Registry

US Zika Pregnancy Registry
What Pregnant Women Need to Know

What is the purpose of the registry?
CDC developed the US Zika Pregnancy Registry to:
- Learn more about the effects of Zika virus infection (Zika) during pregnancy.
- Learn more about the growth and development of babies whose mothers had Zika while pregnant.
CDC will collect health information about Zika among pregnant women and babies across the United States for the registry. CDC and health departments will use the information from this registry to help pregnant women and families affected by Zika. The knowledge gained from this registry will help doctors and other healthcare providers care for pregnant women and their babies.

Who is being included in the registry?
Women living in the United States who have been infected with Zika during pregnancy and their babies can be included in the registry.

What will be done with the information collected?
The identity of people in the registry will be kept private and secure. The information your doctor or other healthcare provider shares will be added to the registry with information about other pregnant patients with Zika, and the babies born to these mothers, to help CDC and state health departments develop a clearer picture of how Zika affects pregnant women and their babies.

What do I have to do to be in the registry?
You will not need to do extra paperwork, go to extra appointments, or have extra tests to be part of the registry. If your healthcare provider is participating in this Registry, she/he will share information about your health with your health department and the CDC, the Federal public health authority that is trying to understand, prevent, and control disease. Your health department and CDC will work with your doctor and other healthcare providers to collect all of the information needed. For this registry, your health department and CDC will:
- Collect information about your pregnancy.
- Collect information about you and your baby around the time the baby is born.
- Contact the baby’s doctor or other healthcare provider to collect information about the baby’s growth and development up to his or her first birthday.
If you change doctors or healthcare providers, please request that your new provider contact registry staff through the email address below.
As established in the HIPAA Privacy Rule (45 CFR 164.522, 164.524, 164.526, and 164.528), you have the right to request from your healthcare provider restrictions to, access to, amendments to, and accounting of the disclosure of your protected health information at any time.

How much does this cost?
Being in the registry will not cost you any money.

What if I have questions about being in the registry?
For more information, call 770-488-7100, visit CDC’s or send questions to ZIKApregnancy@cdc.gov.

*Yeito Fuso is establishing a separate Zika Active Pregnancy Surveillance System (ZAPSS)
Daily Activities

Respond to Zika inquiries from the public, healthcare providers, and local health departments

Investigate suspected Zika cases
- provide education
- mosquito surveillance and control

Coordinate Zika testing with local, state, and CDC laboratories
Zika Testing

- The Arizona State Public Health Laboratory can test for Zika virus:
  - In humans
  - In mosquitoes
Information Sharing

ARIZONA HEALTH ALERT NETWORK

Register Now: han.health.azdhs.gov

The Arizona Health Alert Network (AzHAN) is a secure web-based notification system available 24/7/365 that distributes important public health alerts to public health officials and healthcare professionals.
Public Education

www.azhealth.gov/zika
Rapid Response Teams
So, what’s the threat in AZ?

- We have the right kind of mosquito
- We have travelers from Zika-affected areas
- Many households are screened or air conditioned in areas with *Aedes* mosquitoes
- We’ve successfully responded to *Aedes*-caused outbreaks recently
• **Inspect** yard for mosquito breeding sites
• **Remove** containers that collect water
• **Cover** or turn over wheel barrows, canoes, etc.
• **Drain and scrub** containers that cannot be removed (e.g. pet bowls and bird baths)
• **Prevent** mosquito bites
How's your first flight son?

Feels great, Dad! Everyone was clapping for me!

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