

# Zika Risk and Preparedness in New Mexico

## Zika in Context

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# Objectives

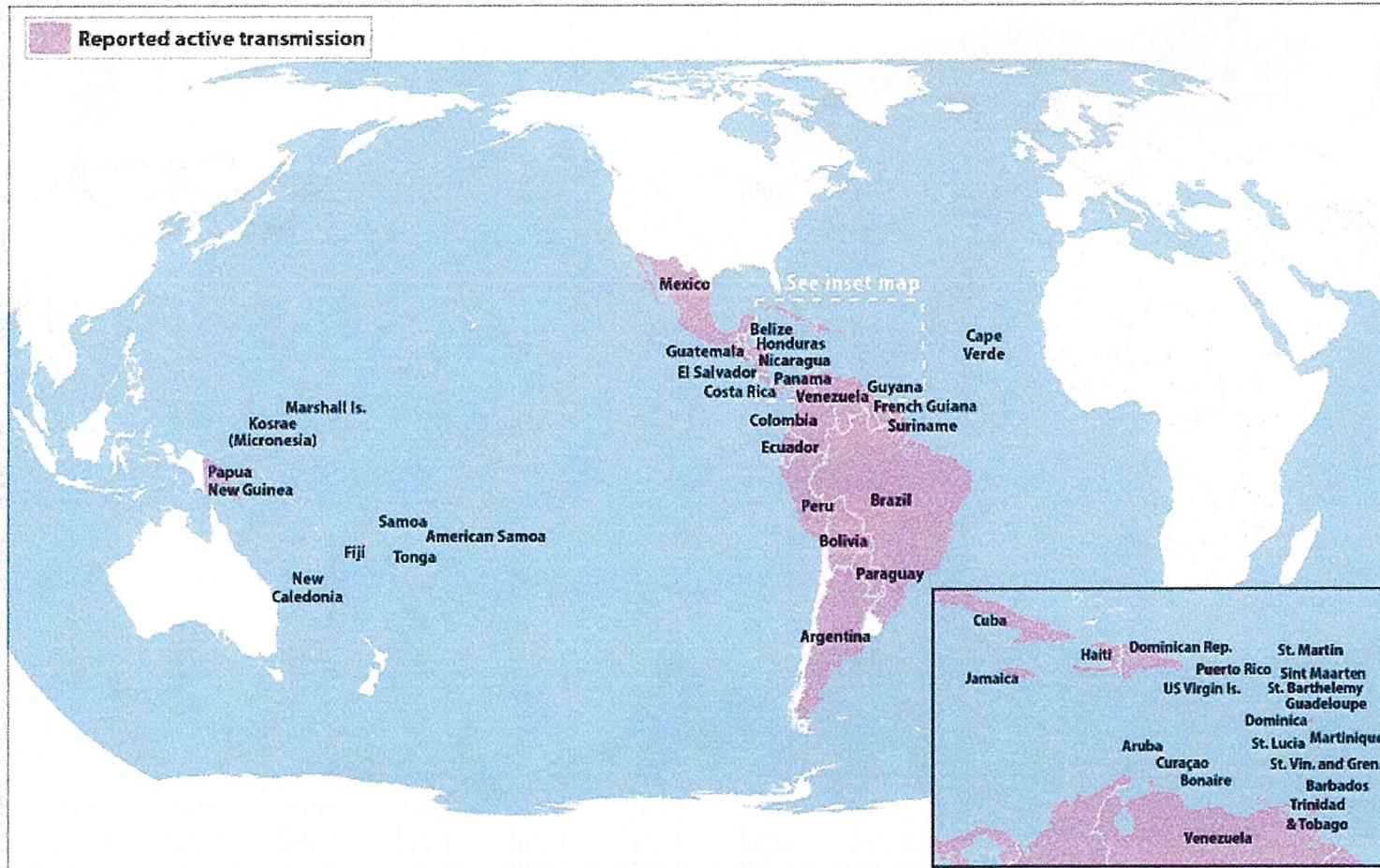
- Epidemiology of Zika Virus Disease
- Preparedness for Zika Virus Disease in NM
- Surveillance and Control of Zika Virus Disease
- Risk of Zika Virus Disease in NM
- Zika Virus Disease in Context

# Epidemiology

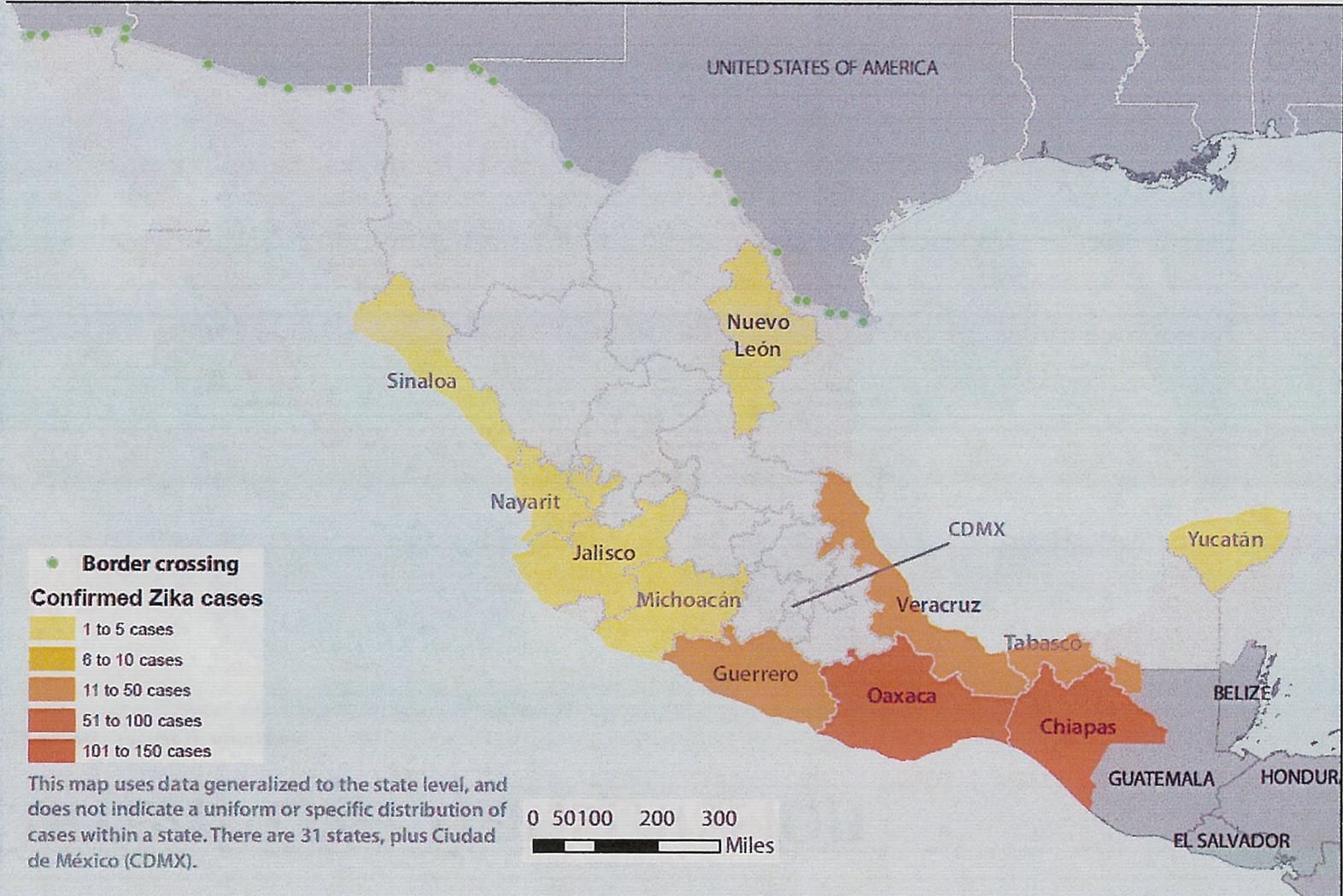
# History

- Zika virus first discovered in Uganda, in the Ziika Forest, in 1947
- From 1947-2006 there were 14 cases
- In 2007 on the island of Yap in the South Pacific there was a large outbreak
- 2013-2014 - further spread in the South Pacific
- February 2015 - first Brazil cases

# Current Zika Transmission

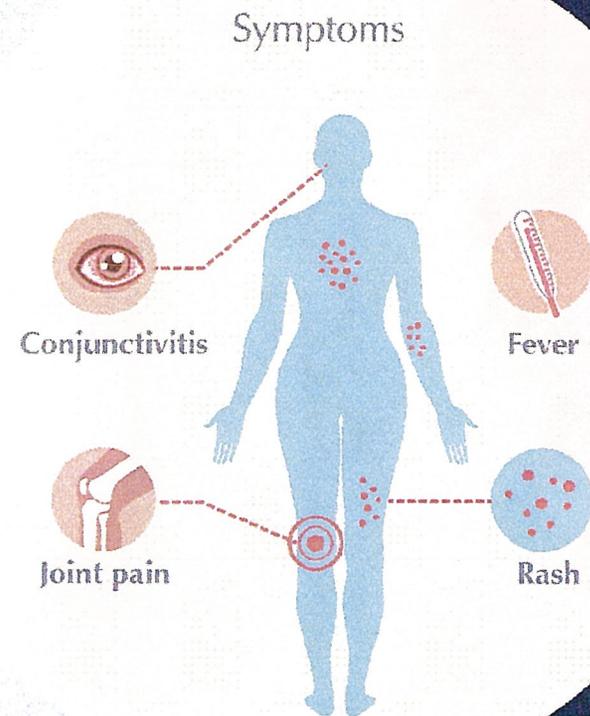


### Confirmed Zika cases by state – Mexico — Epi Week 22



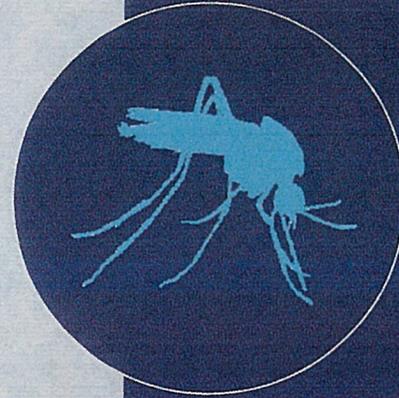
## Symptoms

- Many infections asymptomatic.
- Most common symptoms
  - Acute onset of fever
  - Maculopapular rash
  - Joint pain
  - Conjunctivitis
- Other symptoms include muscle pain and headache.



## Modes of transmission

- Bite from an infected mosquito
- Maternal-fetal
  - Intrauterine
  - Perinatal
- Sexual transmission from infected male partners
- Laboratory exposure
- Theoretical: blood transfusion, organ and tissue transplant, fertility treatment, and breast feeding



## Incubation and viremia

- Incubation period for Zika virus disease is 3–14 days.
- Zika viremia ranges from a few days to 1 week.
- Virus remains in semen longer than in blood.

## Zika virus clinical disease course and outcomes

Clinical illness is usually mild.

Symptoms last several days to a week.

Severe disease requiring hospitalization is uncommon.

Fatalities are rare.

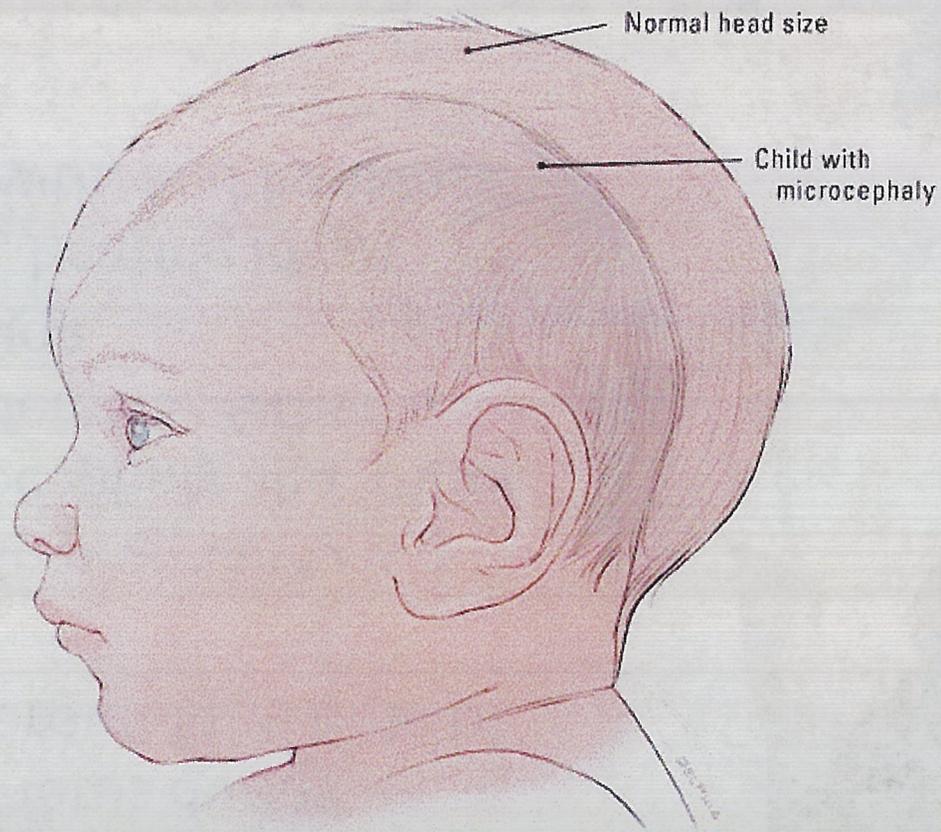
Guillain-Barré syndrome (GBS) reported in patients following suspected Zika virus infection.

- Relationship to Zika virus infection is not known.

## Zika and pregnancy outcomes

- Zika virus can pass from a pregnant woman to her fetus during pregnancy or around the time of birth.
- Zika infection in pregnancy is a cause of microcephaly and other severe brain defects. Other problems include
  - Eye defects, hearing loss, impaired growth, and fetal loss.





Seizures, developmental delays, intellectual disabilities, hearing loss, vision problems, difficulty feeding/eating, balance/locomotion problems. Mild to severe, lifelong.

## Clinical Features: Zika Virus Compared to Dengue and Chikungunya

Features	Zika	Dengue	Chikungunya
Fever	++	+++	+++
Rash	+++	+	++
Conjunctivitis	++	-	-
Arthralgia	++	+	+++
Myalgia	+	++	+
Headache	+	++	++
Hemorrhage	-	++	-
Shock	-	+	-

# Zika Virus Vectors: *Aedes* Mosquitoes

- *Aedes* species mosquitoes
  - *Ae aegypti* more efficient vectors for humans
  - *Ae albopictus*
- Also transmit dengue and chikungunya viruses
- Lay eggs in domestic water-holding containers
- Live in and around households
- Aggressive daytime biters
- Lifetime flight range is at most 150 meters

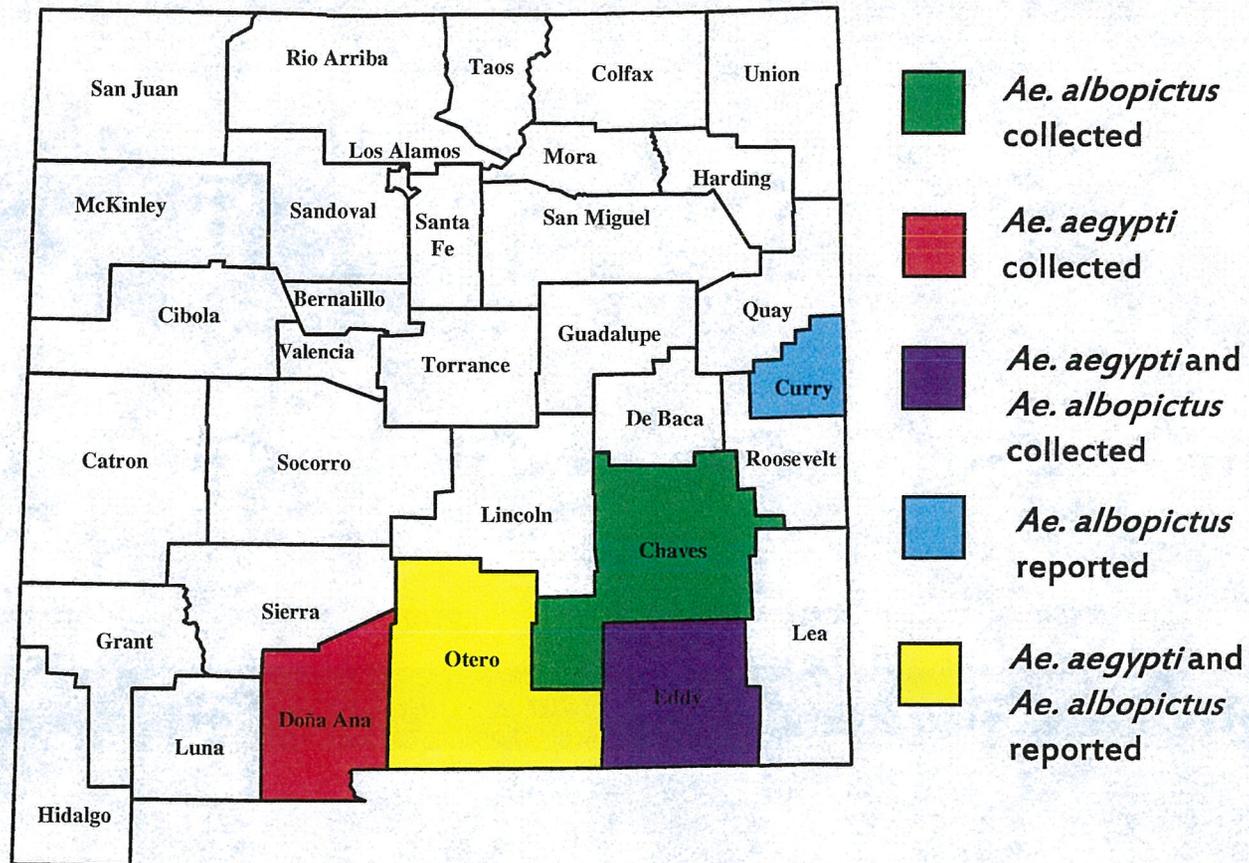


*Aedes aegypti*



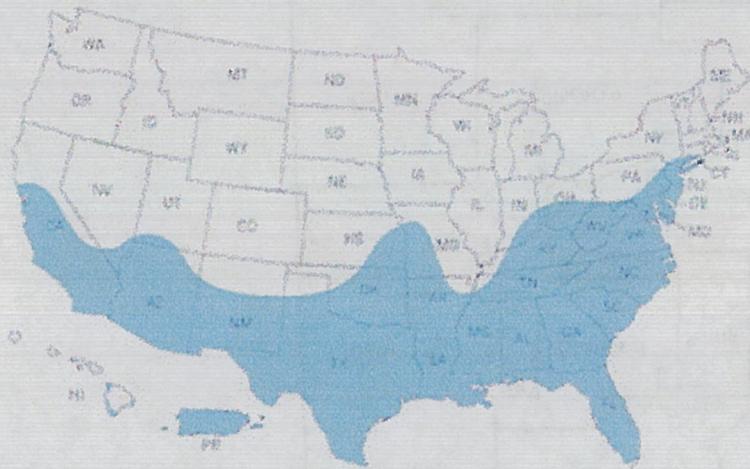
*Aedes albopictus*

# *Aedes aegypti* & *Aedes albopictus* in NM

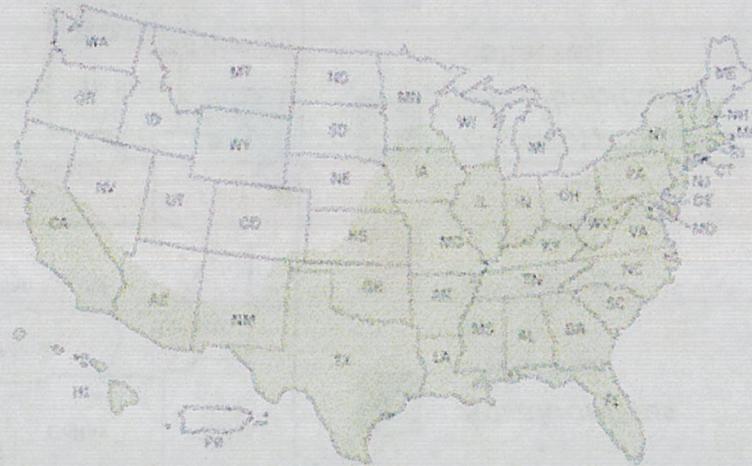


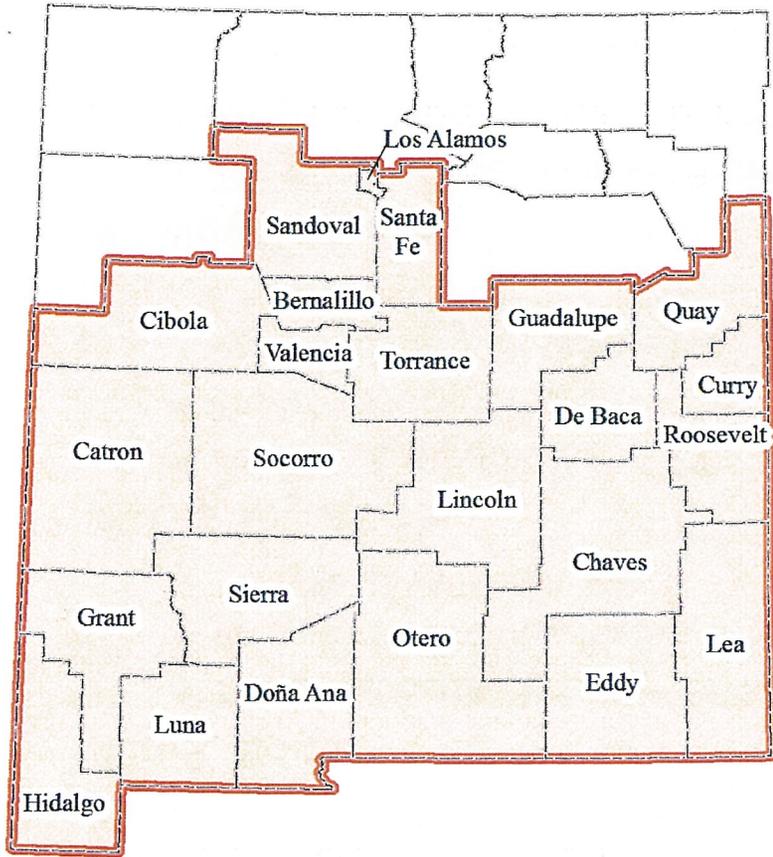
## Estimated Range of *Aedes aegypti* and *Aedes albopictus* in the United States

Estimated range of *Aedes aegypti* in the United States, 2016\*



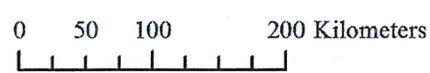
Estimated range of *Aedes albopictus* in the United States, 2016\*





**Mosquito Sampling Area in New Mexico**

-  Counties
-  Sampling Area



Projection: UTM, Zone 13S, WGS 1984



**SouthWest Aedes Research and Mapping**



# Zika Cases, U.S and New Mexico

(January 2015 to present)

- U.S. States

- Travel-associated cases – 934
- Pregnant women with lab evidence of possible Zika– 287
  - Infants with birth defects – 7

- U.S Territories

- Locally acquired cases – 2,020
- Travel-associated cases – 6
- Pregnant women with lab evidence of possible Zika – 250
  - Infants with birth defects – 0

- New Mexico

- Travel-associated cases – 3 (none in counties with mosquitos at that time)
- Pregnant women with lab evidence of possible Zika - 0

Preparedness

# What can we do to prepare for and prevent local transmission?

- Local community meetings about eliminating breeding habitat
- Tire amnesty/pick up
- Ordinances for standing water on private property
- Educate code enforcement on what to look for
- Hand held sprayers: training for local vector control
- Determine pesticide resistance in local mosquito populations
- Educate general public about potential need to spray in back yards if local transmission occurs



[www.epa.gov/insect-repellents/find-insect-repellent-right-you](http://www.epa.gov/insect-repellents/find-insect-repellent-right-you)

Effective: DEET, picaridin, IR3535, oil of lemon eucalyptus  
Follow label instructions!

# Traveler Zika Prevention Recommendations

- All pregnant women advised not to travel to any of the affected countries while pregnant
- Women who travel to these areas should wait 8 weeks after return to attempt conception
- All males with pregnant partners that have travelled to one of the affected countries should abstain from having sex or use condoms consistently throughout the whole pregnancy
- Men should wait 8 weeks after return to attempt conception
- If travel to one of the affected countries is necessary, then people should avoid mosquito bites by using insect repellents according to the label, sleeping under mosquito nets, etc.
- Returned travelers should take steps to prevent mosquito bites for 3 weeks after returning to NM

# Surveillance and Control

# How do we detect cases?

- Health care providers (HCP) given up to date information on what to look for in returned travelers from countries with active Zika transmission via Health Alert Network (HAN), especially Ob/Gyn providers and Midwives (over 3,000 HCPs on the HAN list)
- Diagnostic testing available through the NMDOH Scientific Laboratory Division. Commercial laboratory testing is available but limited. Health care providers consult with NMDOH on need for testing.
- NMDOH surveillance team monitors for Zika laboratory positive cases and begins epidemiologic investigation immediately

# Zika testing guidelines

- All pregnant women with history of travel to one of the affected countries are to be tested:
  - Immediately if symptomatic
  - Within 2-12 weeks of their return if asymptomatic
  - Had unprotected sex with symptomatic returned traveler
- All non-pregnant individuals with travel history will be tested if symptomatic within 2 weeks of return

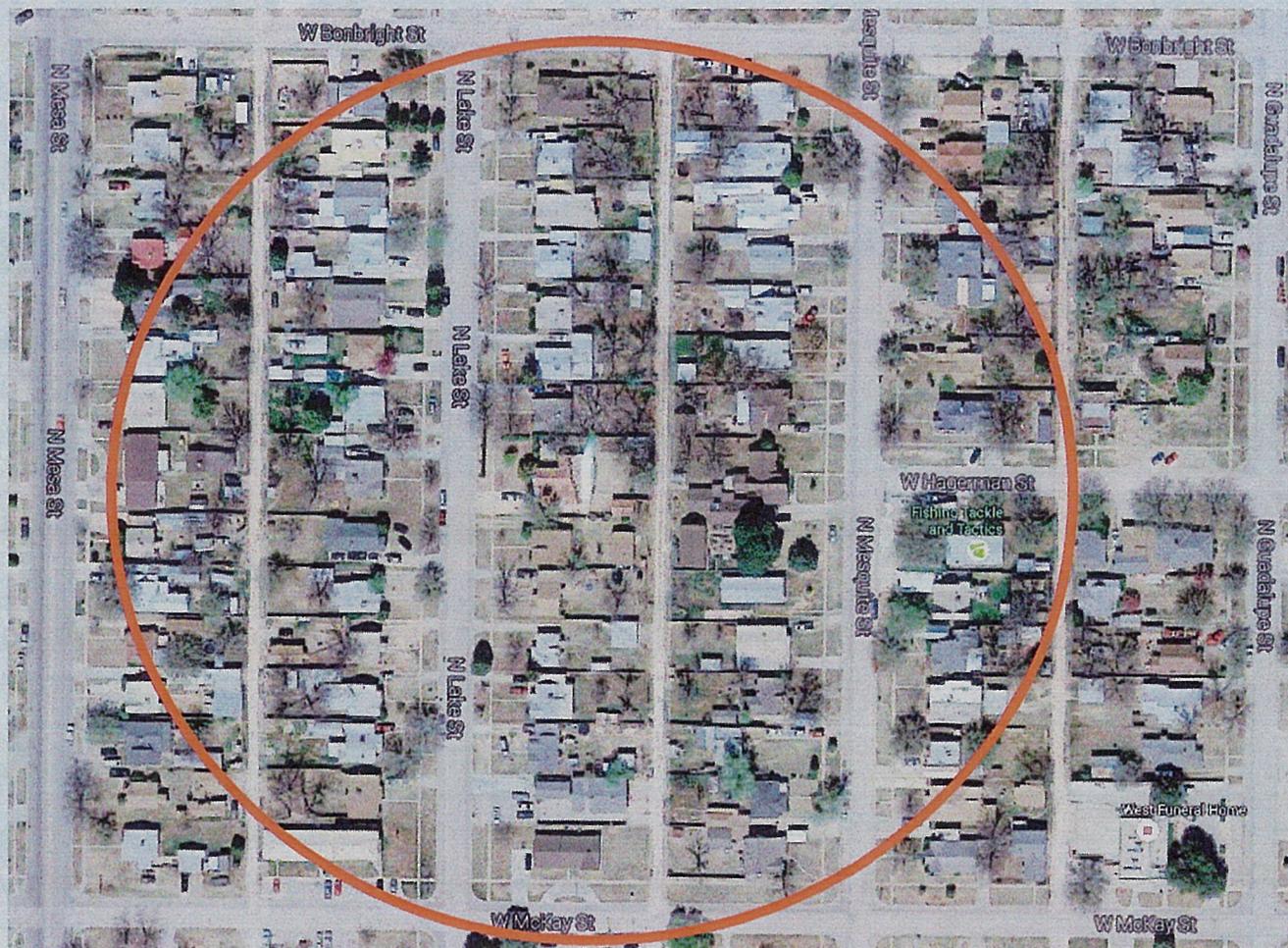
# Transmission Risk Categories

- Travel-associated case – county without mosquitos present
- Travel-associated case – county with mosquitos present
  - Particularly *Aedes aegypti*
- Single case local transmission
- Multiperson local transmission – cases in more than one household
  
- Widespread local transmission
  - Cases with onsets at least 2 weeks apart but within one mile of each other
- Widespread multijurisdictional transmission

## Community response for confirmed cases in counties with *Aedes* mosquitos

- Response team will go door-to-door, in a 150 m radius of the general location of the case, distributing literature on Zika and educating neighbors on signs and symptoms to look for, eliminating mosquito breeding habitat, preventing mosquito bites (day and night), proper use of insecticide and avoiding mosquitoes indoors by making sure door and window screens are in proper repair.
- Local vector control team will go around a 150 m radius of the general location of the case, requesting permission to enter people's home to spray adulticide with handheld foggers in their backyards and applying larvacides into ponds and other water bodies.
- Local code enforcement might be necessary to issue citations to homes with container breeding sites that are rearing *Aedes* mosquitoes.
- Tire amnesty/pick up might be arranged to help eliminate mosquito breeding habitat

# Carlsbad



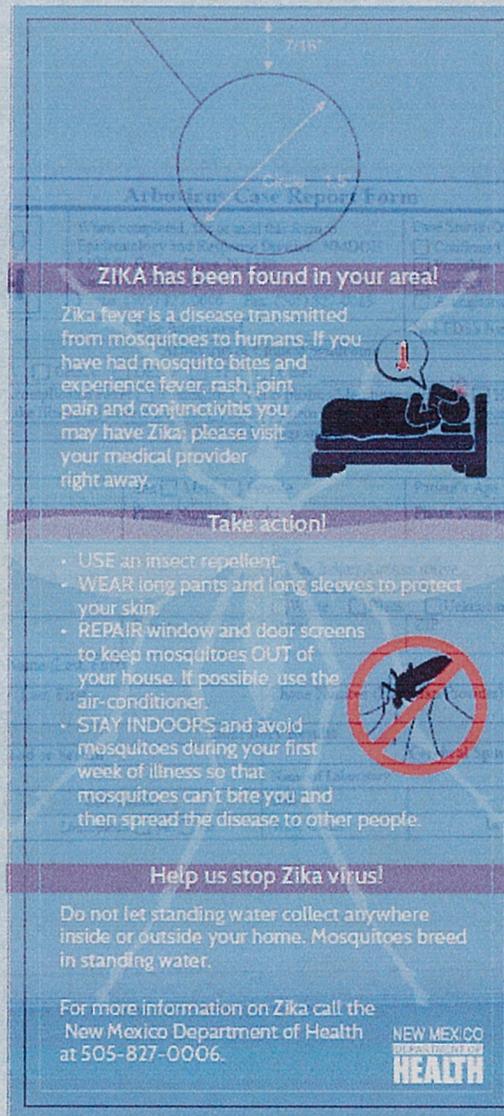
# Mosquito control

- Survey and monitor mosquito populations
- Track insecticide susceptibility
- Source reduction
- Initiate mosquito control to a travel-associated case
  - Mosquito surveys
  - Source reduction
  - Larviciding
  - Adulticiding
- Mosquito control for a local transmission case(s)
  - Area probably larger than above – Zika transmission area
  - Consider CDC Emergency Response Team assistance for mosquito control

# Education Steps

Local community health workers, Promotoras de Salud, DOH staff.

Door-to-door education:  
Presence of Zika virus in the neighborhood and prevention steps



7/16"

Circle 1.5"

**ZIKA has been found in your area!**

Zika fever is a disease transmitted from mosquitoes to humans. If you have had mosquito bites and experience fever, rash, joint pain and conjunctivitis you may have Zika; please visit your medical provider right away.



**Take action!**

- USE an insect repellent.
- WEAR long pants and long sleeves to protect your skin.
- REPAIR window and door screens to keep mosquitoes OUT of your house. If possible, use the air-conditioner.
- STAY INDOORS and avoid mosquitoes during your first week of illness so that mosquitoes can't bite you and then spread the disease to other people.



**Help us stop Zika virus!**

Do not let standing water collect anywhere inside or outside your home. Mosquitoes breed in standing water.

For more information on Zika call the New Mexico Department of Health at 505-827-0006.

NEW MEXICO  
DEPARTMENT OF  
**HEALTH**



7/16"

Circle 1.5"

**¡EL ZIKA ha sido detectado en su vecindario!**

La fiebre del zika es una enfermedad en humanos transmitida por mosquitos. Si le han picado mosquitos y ahora tiene fiebre, erupción en la piel, dolor en las articulaciones y conjuntivitis, es posible que tenga zika; por favor consulte con su doctor de inmediato.



**¡Actívese!**

- USE un repelente contra insectos.
- USE pantalones largos y camisas manga larga para proteger su piel de las picaduras de mosquitos.
- REPARE las mallas de las ventanas y puertas para que los mosquitos no puedan entrar a su hogar. De ser posible use el aire acondicionado.
- QUÉDESE ADENTRO y evite los mosquitos durante la primera semana de su enfermedad para evitar que los mosquitos lo piquen y luego pasen la enfermedad a otros.



**¡Ayúdenos a eliminar el virus ZIKA!**

No permita que se acumule agua estancada en ningún sitio dentro o fuera de su hogar. Los mosquitos ponen sus huevos en agua estancada.

Si necesita más información sobre el Zika, llame a la Secretaría de Salud de Nuevo Mexico al 505-827-0006.

NEW MEXICO  
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**HEALTH**

# Vaccine development

- Zika virus vaccine development underway
- DNA vaccine
  - Successful in mice
  - Human vaccine safety trials starting in late summer for 3 months
  - Then clinical trials will occur
- Inactivated virus vaccine
  - Successful in mice
  - Clinical trials to occur in the fall
    - NIH and Walter Reed

# Risk in New Mexico

# Continental U.S. Experience with Related Infections - Chikungunya and Dengue

- Single local transmission cases most typically have no evidence of further transmission
  - Of 12 chikungunya cases in south Florida in 2014, only two appeared linked
- Ongoing local transmission of dengue has only occurred in the Florida Keys and southernmost Texas, and has not expanded beyond these areas
  - The experience with dengue may be helpful with predicting Zika transmission
- Prolonged widespread local transmission of Zika is not expected
- Local transmission is more likely to occur when competent *Aedes* populations are present in a community

# Risk Communication

- It is important to assure public level of concern for Zika is not too high but not too low – risk communication differs geographically
  - Travelers to areas with Zika transmission
  - Residents of areas without *Aedes* mosquitos – most New Mexicans live here
  - Residents of areas with transmission of dengue or chikungunya – none in NM
  - Residents of areas with *Aedes* mosquitos
  - Residents of areas with single case local transmission
  - Residents of areas with multiperson local transmission

Context

# Public Health Emergencies Present Opportunities

- Pandemic Influenza (2009)
  - Developed influenza hospitalization surveillance
  - Developed improved messaging around influenza risk
  - Learned of increased risk to American Indians and focused vaccination/antivirals toward this population
- Ebola (2014-15)
  - Included EMS in preparedness much more than previously
  - Developed traveler monitoring
  - Developed regional highly infectious disease hospitals focusing on improved infection control

# Opportunities with Zika

- Increased federal funding likely
  - Preparedness funding - mosquito control tracking and planner, southern NM
  - Other funding likely for improved mosquito, Zika and birth defects surveillance; and mosquito control
- Mosquito control improvements and coordination
- Birth defects surveillance
- Also preparation for dengue, chikungunya and other mosquito-borne diseases

# Conclusions

- New Mexico has had a few travel-associated Zika cases and should expect more
- New Mexico has had no locally acquired dengue or chikungunya cases reducing the likelihood of locally acquired Zika
- To date, evidence for *Aedes* mosquitos in NM is sparse – systematic surveillance is ongoing
- CDC does not expect prolonged widespread local transmission in the continental U.S.
- Zika vaccine development is progressing and looks promising
- Preparedness for Zika in NM will continue throughout the summer

# Recommendations

- Complete systematic mosquito surveillance this summer
- Target future preparedness activities to counties with *Aedes* mosquitos
- Continue to work with local government to enhance mosquito control
- Improve birth defects surveillance
- Continue to strengthen the overall approach to infectious disease control and surveillance

### CONCLUSIONS

- The results of the present study indicate that the use of a...
- The use of a...

### REFERENCES