



# Zika Virus: Protecting the Public

The Tennessee Surveillance Perspective

Mid-Atlantic Mosquito Control Association  
Newport News, VA

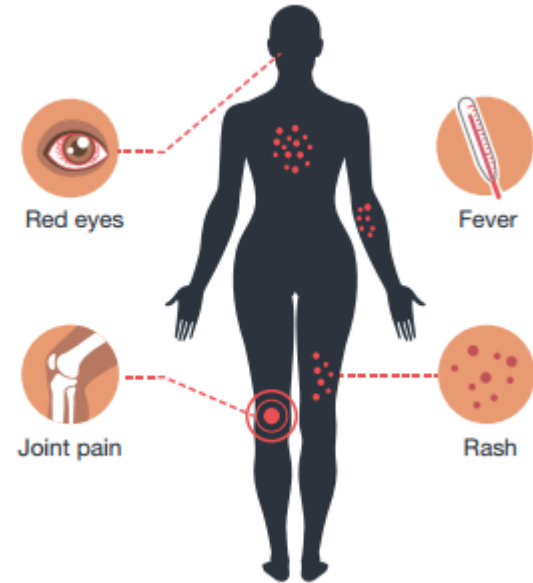
# Zika Virus

- (+)ssRNA flavivirus
- Transmission routes;
  - Bite of infected *Ae.* mosquito
  - Pregnant woman to her fetus
  - Sex with an infected partner
  - Blood transfusion, fluids (?)
- Infection rate ~ 75%
- Incubation period 3-14 days
- Mild illness in ~ 20%
- Viremia
  - Serum up to 7 days
  - Urine longer
  - Semen even longer

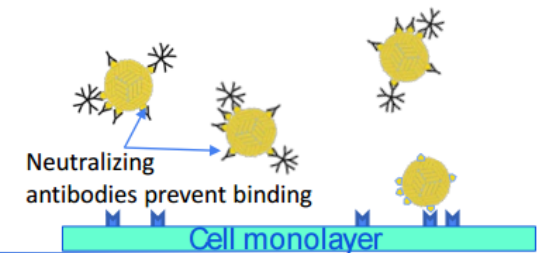


# Zika Disease & Testing

- **Signs and symptoms;**
  - Conjunctivitis, joint pain, fever, rash
  - Birth defects (microcephaly)
    - Eye defects, hearing deficits, impaired growth
  - Guillain-Barré Syndrome
- **No specific treatment**
- **Diagnosis**
  - Clinical signs, and
  - Laboratory evidence of recent infection
    - Antigen detection by PCR; or
    - IgM antibody detection by ELISA confirmed when NAb identified by PRNT
- **No vaccine available**



Plaque Reduction Neutralizing Antibody Test



# Zika Prevention



- Use insect repellent
- Reduce habitat (tip and toss after each rain)
- Keep mosquitoes out of your home



- Use male and female condoms
- Don't share sex toys
- Consider abstinence
- 8 weeks ♀ 6 months ♂



- Check the latest travel notices
- Avoid travel when possible
- Talk to your doctor before conception or travel

# Zika Emergence

## How the Zika virus spread

Active transmission

Known previous transmission

Antibodies also detected



SOURCE: WHO and Lancaster University, Feb.1

Vox

# Zika Transmission Worldwide

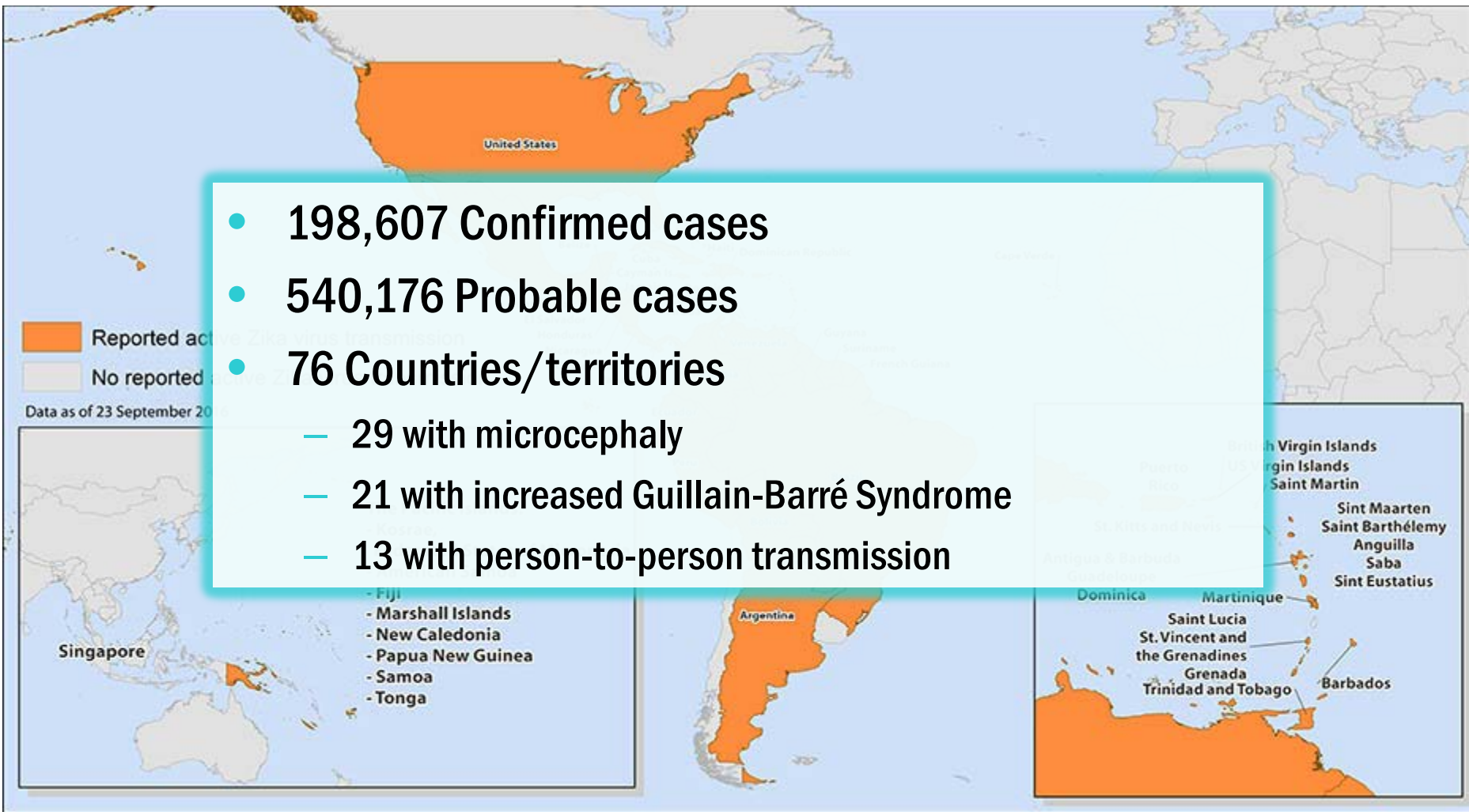


Updated 01/26/2017

<http://www.cdc.gov/zika/geo/active-countries.html>  
<http://www.who.int/emergencies/zika-virus-tmp/en/>



# Zika Transmission Worldwide



Updated 01/26/2017

[http://www.paho.org/hq/index.php?option=com\\_docman&task=doc\\_view&Itemid=270&gid=36250&lang=en](http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&Itemid=270&gid=36250&lang=en)





# Zika Cases Diagnosed in the U.S.

Case Type	U.S. States	U.S. Territories
Travel-associated	4,930	140
Locally-acquired	219	35,644
Sexually-transmitted	40	Data Not Available
Guillain-Barré Syndrome	13	51
Pregnant Women	1,347	2,885
Liveborn w/ birth defects	37	Data Not Available
Pregnancy loss w/ birth defects	5	Data Not Available

CDC is not reporting numbers for adverse pregnancy outcomes in the territories at this time.

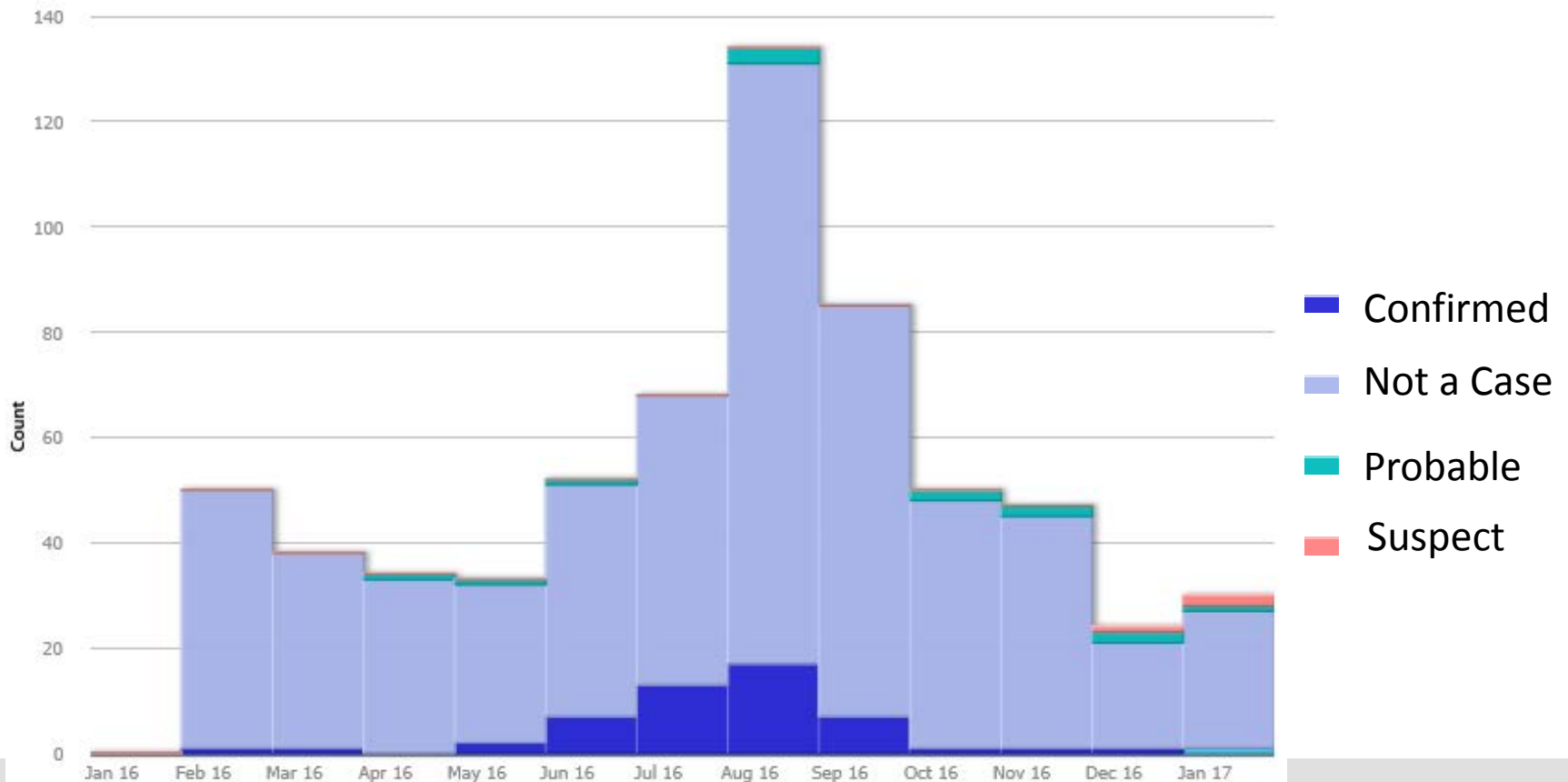
Updated 01/30/2017  
<https://www.cdc.gov/zika/geo/united-states.html>

# Zika Surveillance in Tennessee

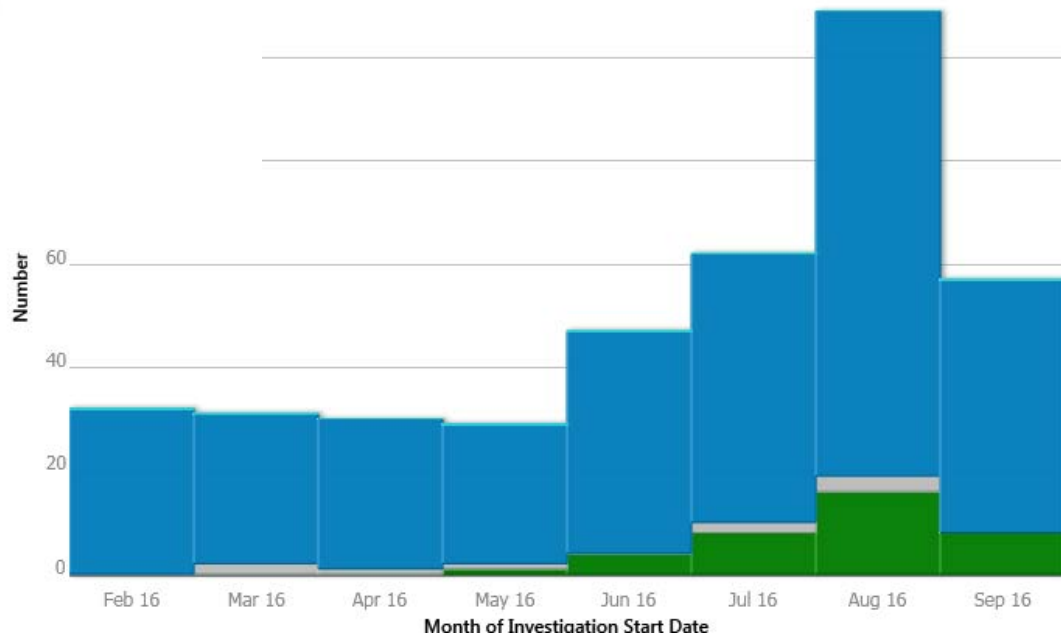
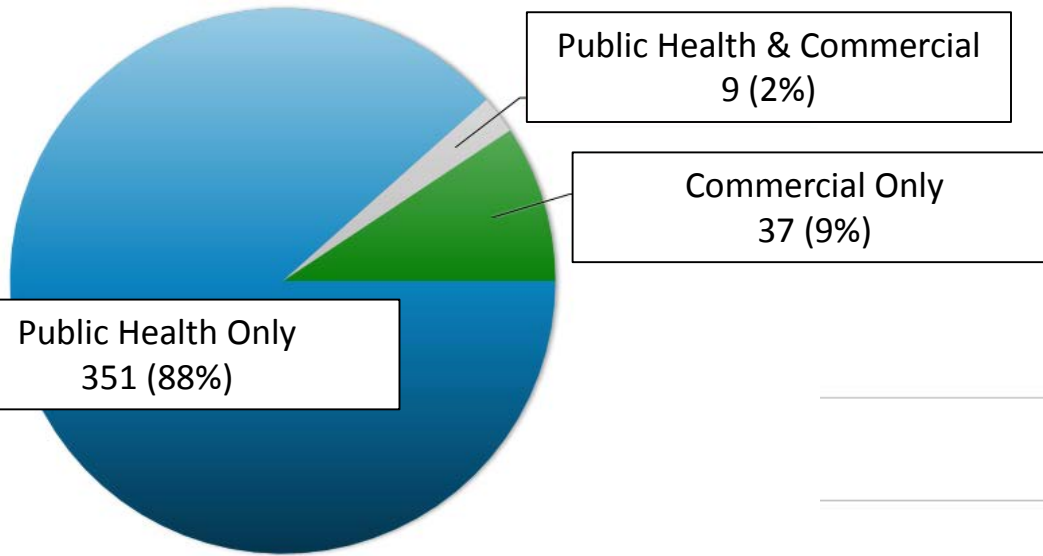
- **Made reportable in TN and notifiable to CDC in Feb 2016**
  - Only accommodated Zika disease (not asymptomatic infections)
  - Testing pregnant women
- **At first, testing only at TDH lab and CDC**
  - ALL tests require pre-authorization by public health (**651** to date)
- **Now, receive electronic lab results from TDH, LabCorp, and Quest (PCR and ELISA)**

# Zika Epidemiology in Tennessee

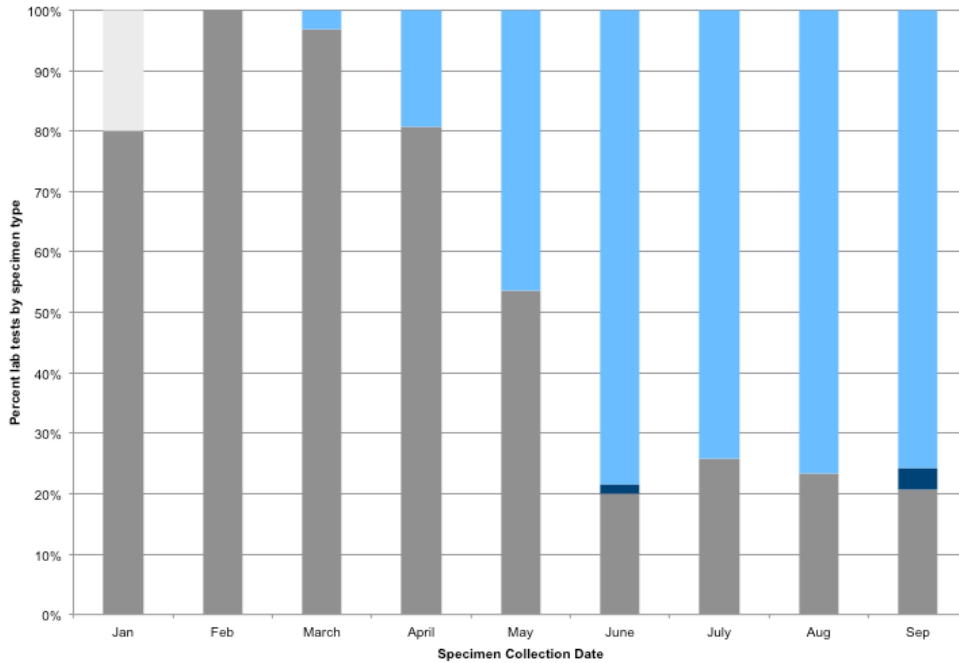
Number of Zika Tests Authorized by Month of Investigation Start Date  
Jan 1, 2016 through Jan 26, 2017



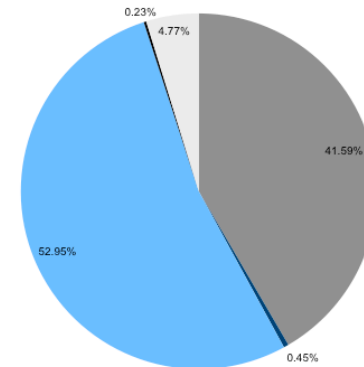
# Public Health vs Commercial Lab Testing



# Specimen collection type



- Other
- Serum and Urine
- Urine
- Serum

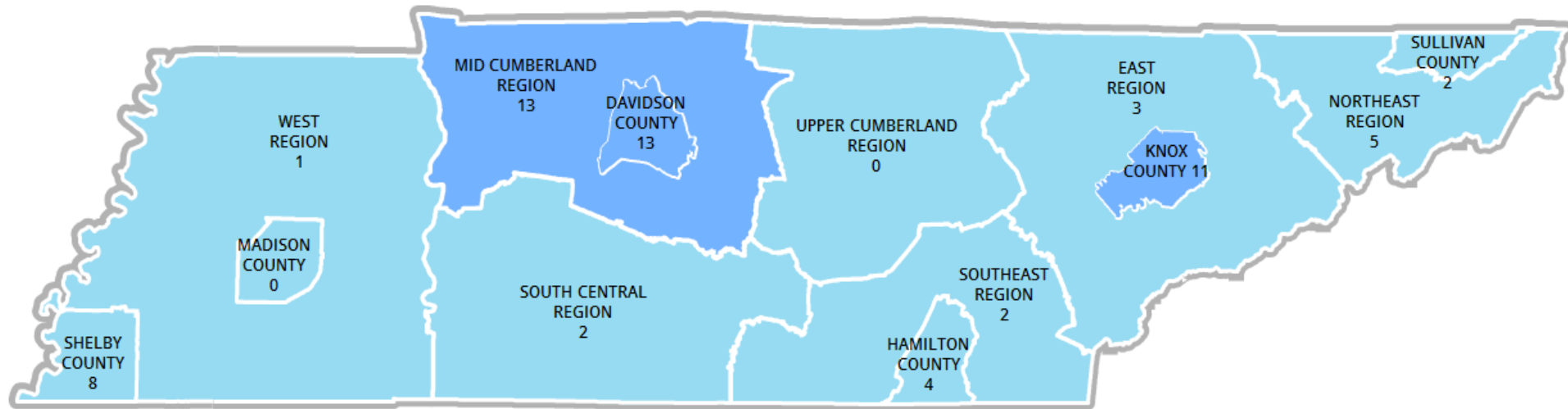


- Specimen type: Serum
- Specimen type: Urine
- Specimen type: Serum and Urine
- Specimen type: Serum and Placenta
- No data



# Zika Cases Reported in Tennessee

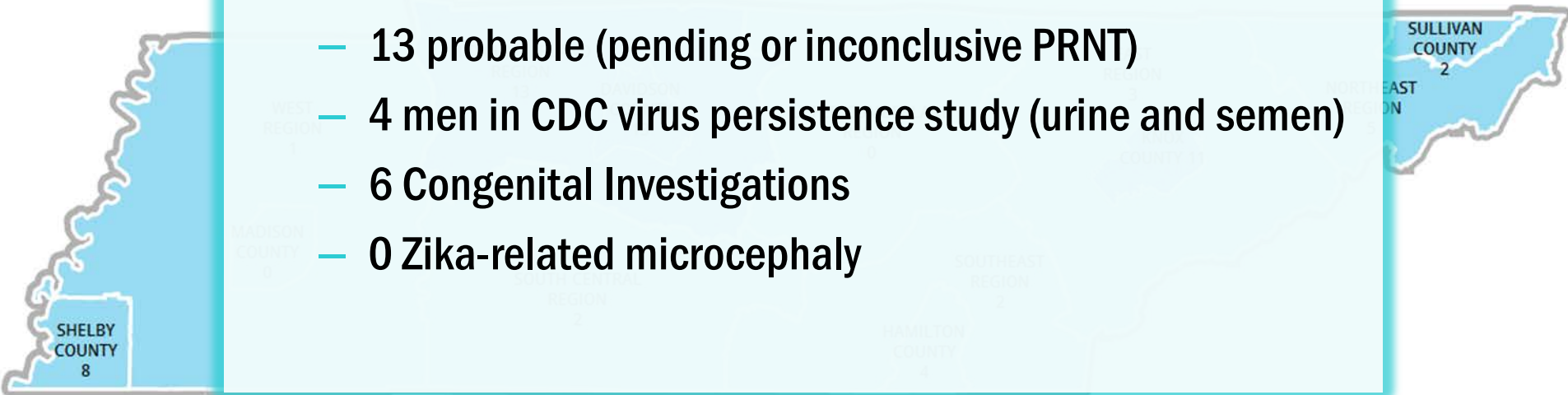
Number of Zika Virus Infections by Public Health Jurisdiction  
Tennessee  
Jan. 1, 2016 – Jan. 26, 2017  
64 Cases



Updated 09/26/2016  
<http://tn.gov/health/topic/zika-virus>

# Zika Cases Reported in Tennessee

- **64 travel-associated cases**
  - 51 laboratory-confirmed
  - 13 probable (pending or inconclusive PRNT)
  - 4 men in CDC virus persistence study (urine and semen)
  - 6 Congenital Investigations
  - 0 Zika-related microcephaly







# Characteristics of Zika Cases (TN & U.S.)

Characteristic	TN N=64 (%)		U.S. N=2,382 (%)	
	Sex			
Female	36	(56)	1,495	(63)
Male	28	(44)	886	(37)
Age group (yrs)				
0-19	8	(13)	208	(9)
20-39	31	(48)	1,012	(42)
40-59	19	(30)	889	(37)
≥ 60	6	(9)	273	(11)
Region				
Caribbean	34	(53)	1,545	(65)
Central America	26	(41)	434	(18)
South America	4	(6)	224	(9)
Sign/Symptoms*				
Rash	50	(85)		
Fever	36	(61)		
Arthralgia	34	(58)		
Conjunctivitis	21	(36)		

\*Symptomatic Cases = 59

TN unpublished data updated 01/26/2017 (01/01/16 – 01/26/17)

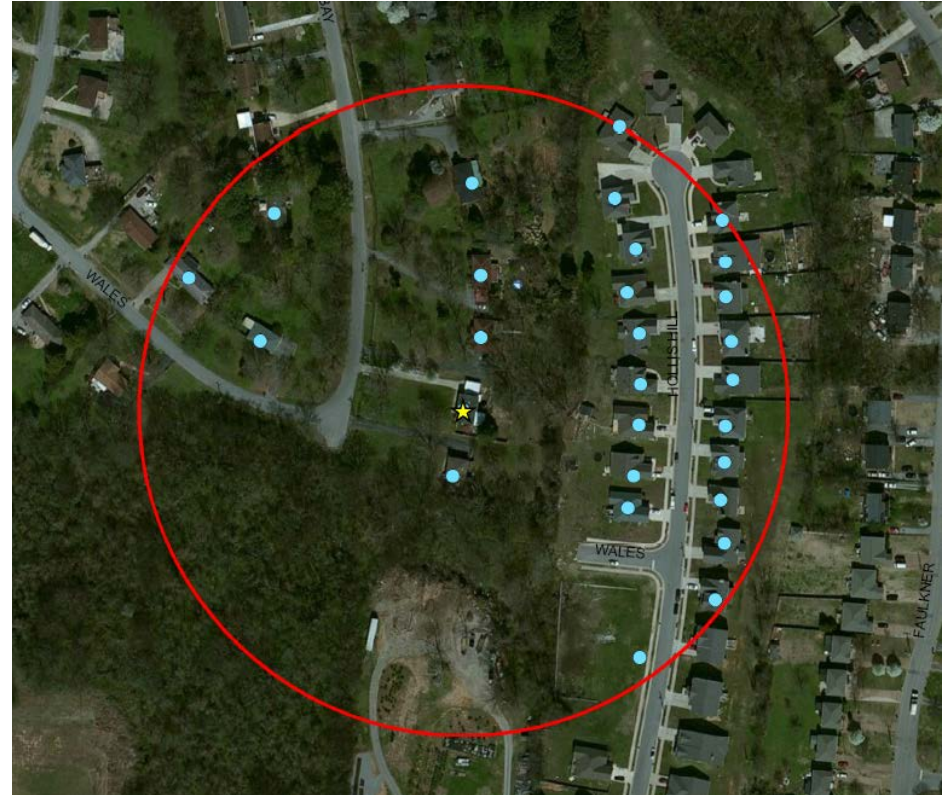
U.S. data through 07/31/2016 at <http://dx.doi.org/10.15585/mmwr.mm6536e5>



# Local Response to Confirmed Zika Cases

If viremic traveler is identified (i.e., PCR +);

- Identify dwellings within a 200 yard radius (mosquito flight range)
- Provide prevention messages on mosquito reduction & avoiding bites
- Encourage healthcare consultation if symptomatic or pregnant within specified date range





Pictured above *A. albopictus* however *A. japonicus* and *A. triseriatus* also have similar dark clypeus



*A. aegypti*

**Clypeus**

Black

White

*A. albopictus*  
*A. japonicus*  
*A. triseriatus*

*Aedes aegypti*

Banded

Dark Legs, Non-banded

**Legs**

*A. albopictus*  
*A. japonicus*

*A. triseriatus*



**Palps**

White tipped

No White Tips

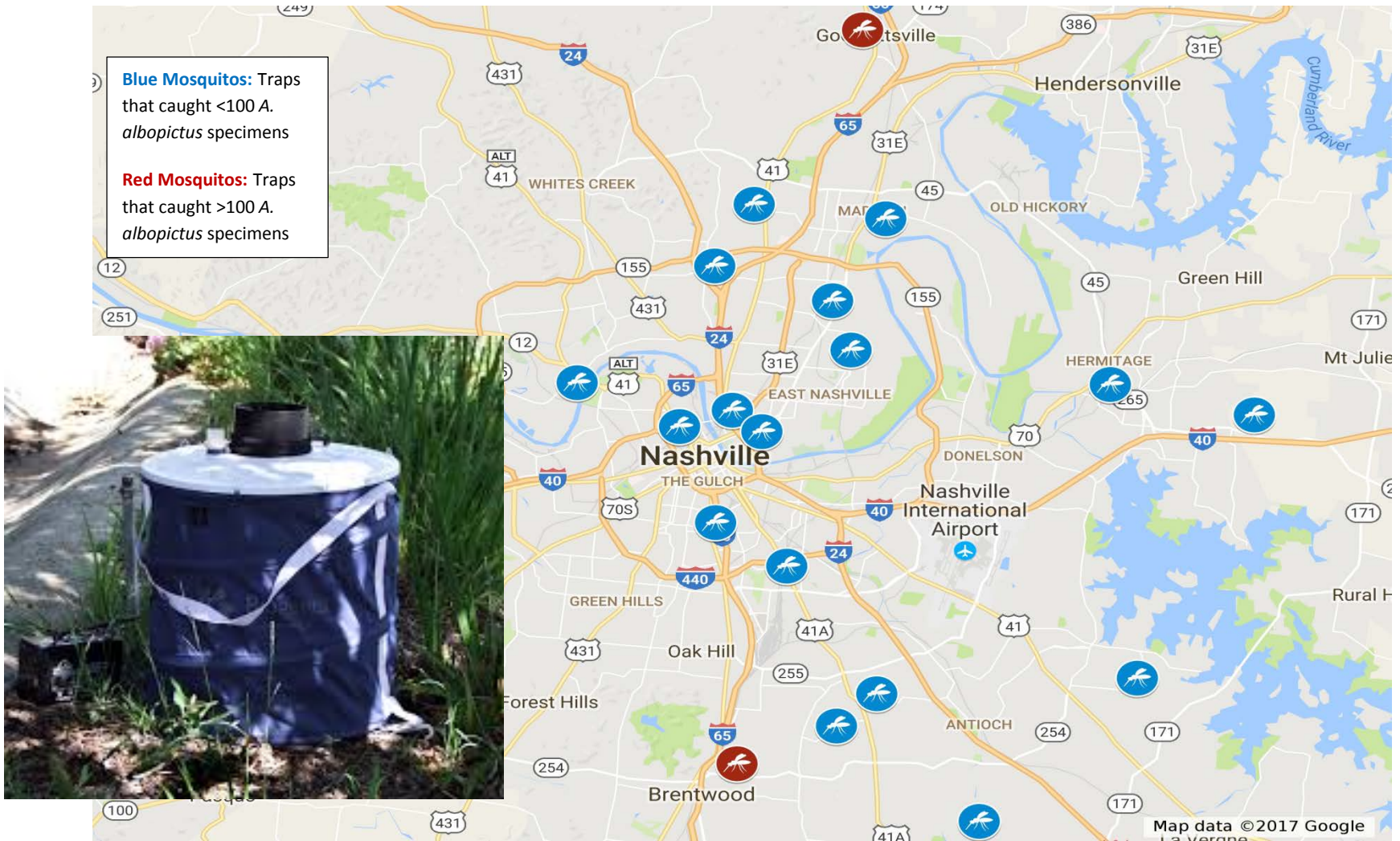


*Aedes albopictus*

*Aedes japonicus*



# September 2016 BG Sentinel Traps, Nashville, TN



*Aedes albopictus*

Females

Average: 31.55

Range: 3-137

*Aedes albopictus*

Males

Average: 6.8

Range: 1-29

