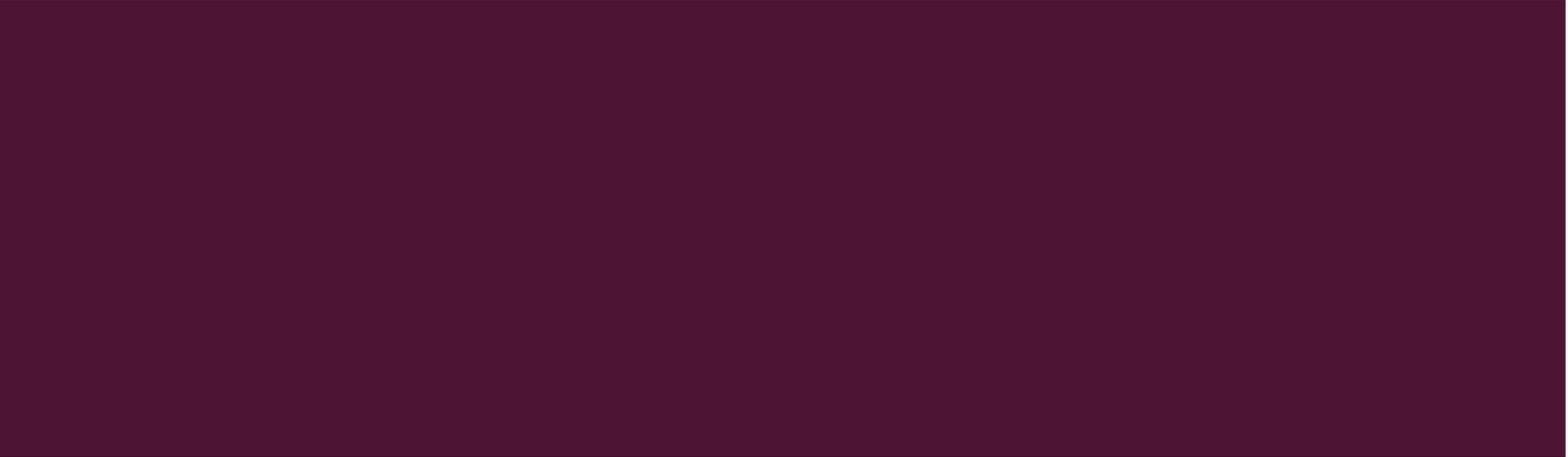




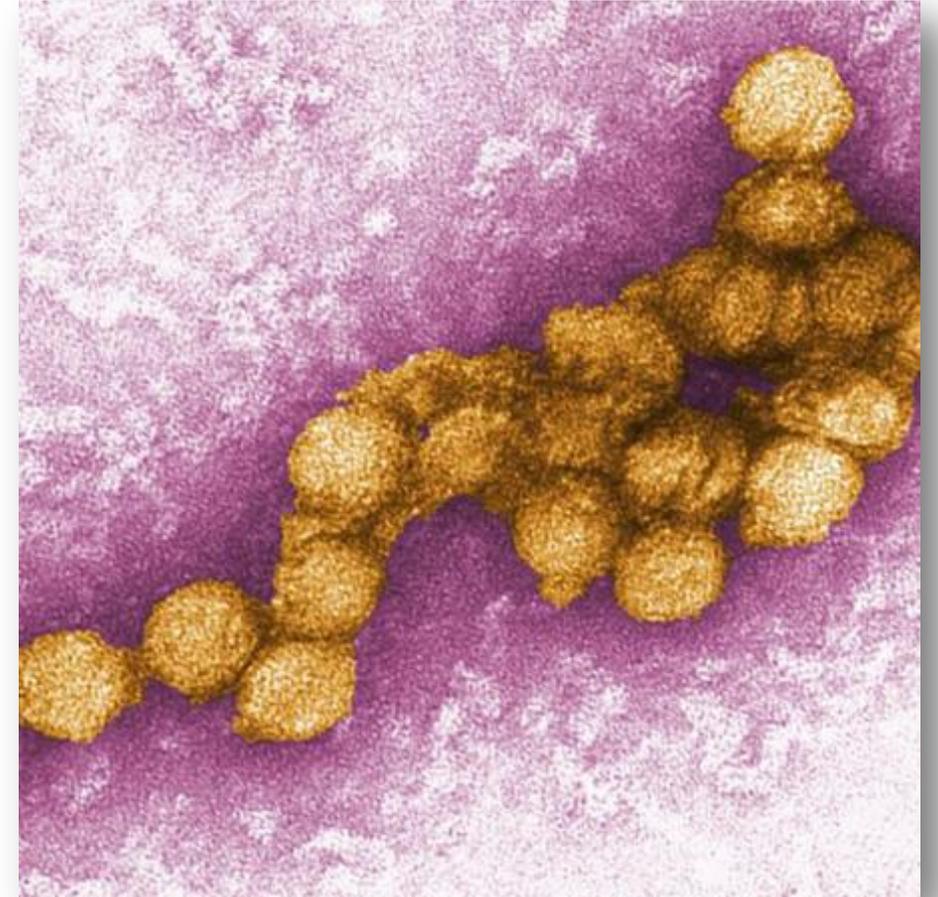
# ZIKA

PRESENTED BY DENNIS QUERTERMOUS, DIANNA HUNTER, MERCEDES RUTLEDGE, AND DRE'ANDRIA THOMPSON



# ZIKA OVERVIEW

- Family: Flaviviridae
- Genus: Flavivirus
- Enveloped, single-stranded RNA virus
- First identified in Uganda in 1947
- First human cases in Uganda and United Republic of Tanzania in 1952
- First major outbreak in 2007



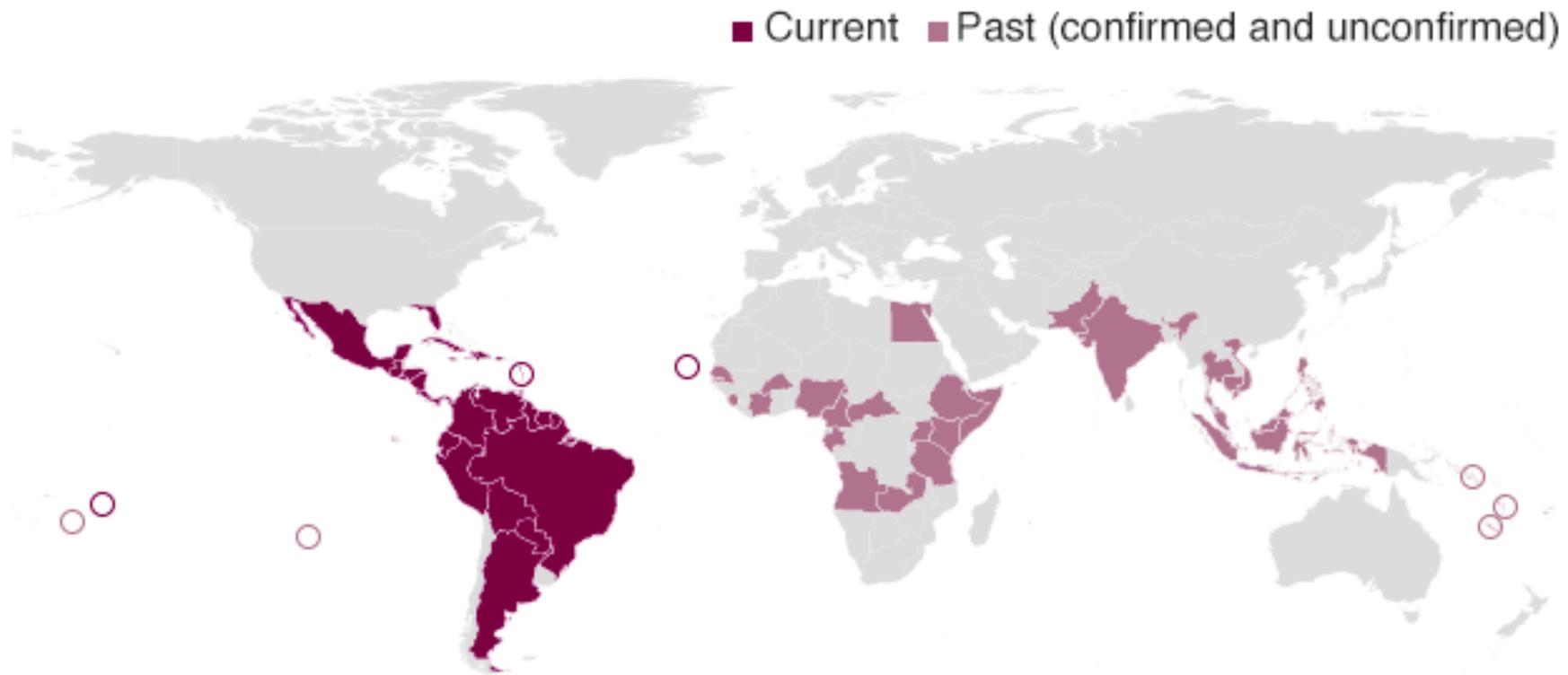
# FLAVIVIRIDAE

- Other members include West Nile virus, Japanese encephalitis virus, dengue virus, and yellow fever virus
- All enveloped single-stranded RNA viruses
- Found and spread by mosquitos, ticks, and other arthropods
- Commonly cause hemorrhaging, meningitis, encephalitis, and flu-like symptoms



# WORLDWIDE ZIKA DISTRIBUTION

## Zika virus past and present



Source: CDC

BBC

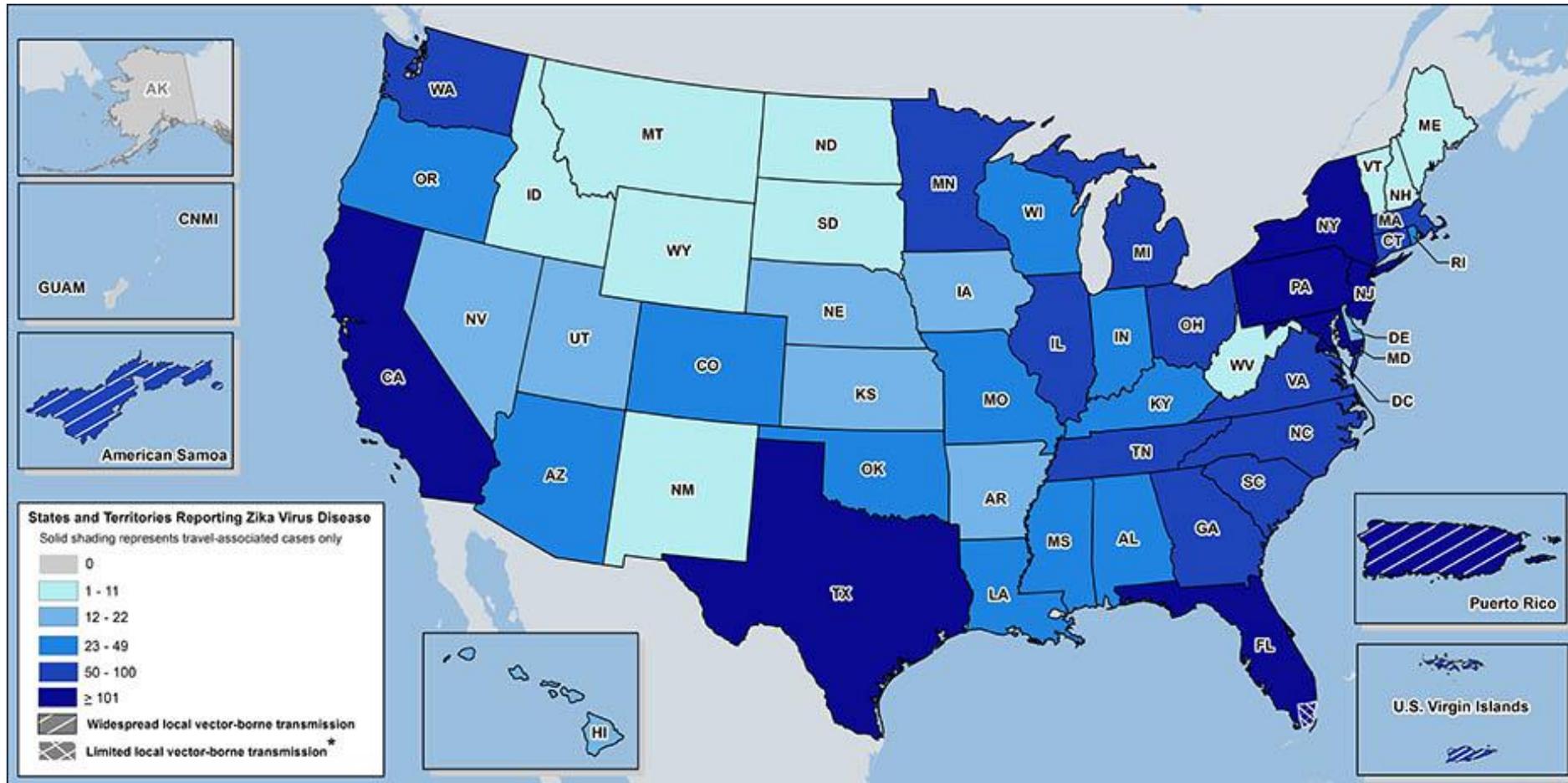
# CASE COUNTS IN THE UNITED STATES

- ArboNET is a national arboviral surveillance system managed by the CDC and state health departments.
- Total cases: 4,128
  - Locally acquired mosquito transmitted cases: 139
  - Travel associated cases: 3,988
  - Laboratory acquired cases: 1
- Sexually transmitted: 34
- Guillain Barrè Syndrome: 13

## In US Territories

- Total cases: 30,178
  - Locally acquired cases transmitted: 30,074
  - Travel associated cases reported: 104
- Guillain Barrè Syndrome: 45

# MAP OF CONFIRMED CASES





# SYMPTOMS AND COMPLICATIONS

## ■ General Symptoms

- Fever
- Skin rash
- Conjunctivitis
- Muscle and joint pain
- Malaise
- Headache
- Usually mild and usually last 2-7 days

## ■ Complications

- Congenital brain defects – including microcephaly
- Congenital Zika syndrome
- Guillain-Barre syndrome
  
- Intense research to investigate link between Zika virus and a range of neurological disorders

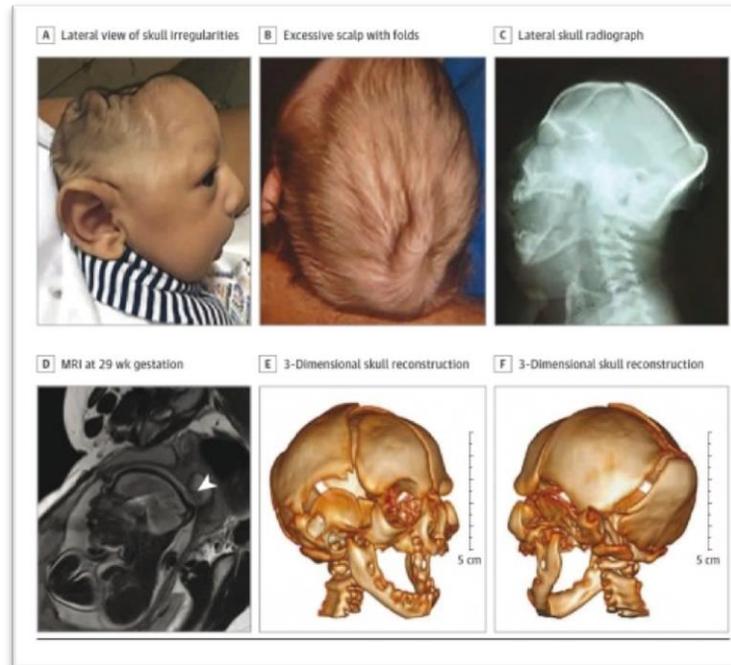
# MICROCEPHALY

- Condition where a baby has a head size much smaller than other babies of the same sex and age
  - Head size is an important indicator of a child's brain growth
  - Many have no symptoms at birth, most develop later, including:
    - Cerebral palsy
    - Learning disabilities
    - Epilepsy
    - Hearing loss
    - Vision problems
  - In a few cases the child develops entirely normally
- **Diagnosis**
    - Sometimes can be made by ultrasound around 28 weeks gestation (end of the 2<sup>nd</sup> trimester) or in the 3<sup>rd</sup> trimester
    - After birth – head circumference measured 24 hours after birth using standardized methods, results interpreted in relation to baby's weight, length, and gestational age
    - Head circumference should be measured monthly during early infancy and compared to growth standards



# CONGENITAL ZIKA SYNDROME

- A pattern of birth defects in fetuses and babies infected with Zika during gestation
- Described by 5 features
  - Severe microcephaly, with partially collapsed skull
  - Decreased brain tissue with a specific pattern of brain damage from calcium deposits
  - Damage to the back of the eye – specific scarring pattern and increased pigment
  - Limited range of motion in joints – such as club foot
  - Too much muscle tone that restricts body movement soon after birth



# GUILLAIN-BARRÉ SYNDROME

- A person's immune system attacks peripheral nerves
- Usually preceded by a viral or bacterial infection, a few cases triggered by vaccines or surgery
- Symptoms usually last a few weeks, most recover without long-term neurological complications
- Symptoms usually start in legs and move to arms and face
  - Weakness
  - Tingling sensation
  - Paralysis of legs, arms or face
  - 20-30% of people have affected chest muscles, making it difficult to breathe
  - Difficulty speaking and swallowing may develop
  - Some have continued weakness
  - 3-5% of patient's die from complications – paralysis of muscles that control breathing, lung clots, cardiac arrest, or blood infection
- Diagnosis
  - Based on symptom and neurological examination
- Treatment
  - Supportive care
  - In acute phase typically treated with immunotherapy like plasma exchange – trying to remove antibodies
  - For persistent muscle weakness – physical therapy



# EMERGENCY SUPPLEMENTAL REQUEST

- **White house sent an emergency supplemental request to Congress for \$1.9 billion (February 2016)**
  - To support our preparedness and response activities
  - For fortifying our domestic public health system
  - To prevent, detect, and respond to Zika virus
  - To accelerate our vaccine research and development to provide a long-term strategy to limit Zika
  - To expand our diagnostic testing capabilities
  - To educate health care providers, pregnant women, and their partners
  - To improve our epidemiology
  - To expand our laboratory capacity
  - To improve health services and support for low-income pregnant women
  - To enhance capability of Zika impacted countries around the world
  - To better combat mosquitos, control transmission, and support the affected population

# FUTURE COSTS OF ZIKA IN THE U.S.

- Hard to calculate, but could be enormous
- Doctors don't expect significant difficulty getting blood tests and additional ultrasounds covered by health plans
- Children with severe microcephaly may need several millions of dollars worth of medical care in adulthood
- Lifetime cost of microcephalic child would be approximately between \$1 million and \$10 million
- Estimates up to 13% of their unborn offspring could develop microcephaly (CDC)
- If 13,000 babies are born in US with this disability, costs could range from \$13 billion to as much as \$130 billion



## FUTURE COSTS OF ZIKA IN THE U.S. (CONT'D)

- Many babies will need developmental services in the first 6 months of life, depending on severity of microcephaly
- **Intensive early intervention services include:**
  - Physical and occupational therapy
  - Speech and hearing therapy
- Not enough info to determine large difference in payment through Medicaid vs. private insurance
- **Biggest unknown**
  - Lack of experience with this level of microcephaly
- **Further research needs to be done**



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QUESTIONS?

