Zika Virus: Implications for the MCAH Population

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CPSP Statewide Meeting
November 2, 2016
Sacramento, CA
Objectives

• Increase knowledge of Zika virus including transmission, disease, population-specific prevention recommendations and testing.
• Increase understanding of the CDPH and LHD response to the Zika epidemic.
• Increase awareness of resources for Zika communications and guidance.
Presentation Instructions

• Please feel free to use this presentation within your local agency and with external community partners.
• Slides 4 and 5 should be updated with current numbers using the link on the respective slide.
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• If you wish to change the slides and customize to your own needs, please remove the CDPH logo, but you are welcome to acknowledge technical assistance from the CDPH Center for Family Health.
• Note: Use of the purchased photos (iStock) in the presentation requires retention of the CDPH logo.
What is Zika Virus?

• Mosquito-borne RNA flavivirus
  – like Japanese encephalitis, dengue, West Nile, and yellow fever viruses
  – Aedes aegypti and Aedes albopictus are vectors

• Named after Zika forest in Uganda where it was first isolated in a rhesus monkey (1947)

• Prior to 2007, only sporadic infections in Africa and SE Asia
How is Zika Virus Transmitted?

**Vectors:** Aedes aegypti and Aedes albopictus

- Also transmit dengue and chikungunya viruses
- Lay eggs in domestic water holding containers
- Live in and around households
- Aggressive daytime biters

A. albopictus  
A. aegypti

Photo Source: CDC

Photo Source: CDC
How is Zika Virus Transmitted?

- **Non-vector transmission**
  - Zika virus can be transmitted from a pregnant mother to her fetus during pregnancy or around the time of birth
  - Zika virus can be sexually transmitted by sex partners
  - Spread of the virus through blood transfusion has been reported
  - Care giving? (1 suspect case, UT)

Transmission of Zika infection through breastfeeding has **not** been documented
Travel-Associated Zika Cases in the US

Continental US: 3,936 cases from 49 states/DC (as of October 12, 2016)
Travel-associated = 3,807, Locally Acquired = 128 (FL), Laboratory Acquired = 1
• Sexually transmitted = 32, Guillain-Barré syndrome=13
• Pregnant women = 878

Confirmed Zika Cases in Mexico by State
January 1, 2016 – October 3, 2016

Data provided by the Mexican Ministry of Health

Ag. = Aguascalientes
Quer. = Querétaro
DF = Distrito Federal
Tl. = Tlaxcala
335 Travel-Associated Zika Cases in California 2015-2016 (as of October 14, 2016)

- Three (3) cases acquired by sexual transmission
- Forty (40) cases are pregnant women
  - Liveborn infants with birth defects: 2
  - Pregnancy losses with birth defects: 0
- Cases reported from 31 counties in California
  - Cases reported in 10 of the 12 counties with Aedes mosquitoes
- Cases updated every Friday on CDPH webpage: cdph.ca.gov/zika
Number of Travel-Associated Cases of Zika in California by Week Reported, 2015-2016

Previously reported cases

New cases for the week
Aedes aegypti and Aedes albopictus Mosquitoes in California

Aedes mosquitoes have been detected in 120 locations in 12 California counties, October 7, 2016

Aedes aegypti and Aedes albopictus Detection Sites by County/City

http://www.cdph.ca.gov/HealthInfo/discond/Documents/AedesDistributionMap.pdf
Potential for Local Transmission is Low

• A viremic person would need to return to a region where there are *Aedes* mosquitoes and be bitten by an *Aedes* that would live long enough to become infectious and bite another person who then becomes infected

• Mitigating factors:
  – Patchy *Aedes aegypti* and *albopictus* distribution in CA
  – Use of air-conditioning and window and door screens
  – Better water management than in other countries
  – Good mosquito control

• If an outbreak were to occur, it would likely be limited in scope and duration

• Outbreaks of dengue and chikungunya elsewhere in the US have been contained

• Therefore the US is unlikely to experience the same extensive outbreaks currently being experienced in Latin America; to date, local transmission in Florida is limited in scope
What are Zika Virus disease Symptoms?

- Most common symptoms - fever, rash, joint pain, and conjunctivitis
- Onset of symptoms 3-14 days after exposure
- Symptoms may last for up to 1 week
- About 20% of individuals develop symptoms

Note: There is no vaccine to prevent or medicine to treat Zika virus infection.
Clinical Characteristics of 31 Patients with Confirmed Zika Virus Disease on Yap Island, April through July 2007

<table>
<thead>
<tr>
<th>Sign or Symptom</th>
<th>No. of Patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macular or papular rash</td>
<td>28 (90)</td>
</tr>
<tr>
<td>Fever*</td>
<td>20 (65)</td>
</tr>
<tr>
<td>Arthritis or arthralgia</td>
<td>20 (65)</td>
</tr>
<tr>
<td>Nonpurulent conjunctivitis</td>
<td>17 (55)</td>
</tr>
<tr>
<td>Myalgia</td>
<td>15 (48)</td>
</tr>
<tr>
<td>Headache</td>
<td>14 (45)</td>
</tr>
<tr>
<td>Retro-orbital pain</td>
<td>12 (39)</td>
</tr>
<tr>
<td>Edema</td>
<td>6 (19)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>3 (10)</td>
</tr>
</tbody>
</table>

* Cases of measured and subjective fever are included.
Clinical features: Zika virus compared to dengue and chikungunya

<table>
<thead>
<tr>
<th>Features</th>
<th>Zika</th>
<th>Dengue</th>
<th>Chikungunya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Rash</td>
<td>+++</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>++</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>++</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Myalgia</td>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Headache</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>-</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Shock</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>
Symptoms Among Children with Postnatally Acquired Zika Infection?

January 2015–July 2016

- 158 cases of children with confirmed or probable Zika virus disease in U.S. (CDC)
- Median age 14 years (range = 1 month-17 years)
- 88 (56%) were female; all travel-associated
  - Rash: 129 (82%)
  - Fever: 87 (55%)
  - Conjunctivitis: 45 (29%)
  - Arthralgia: 44 (28%)
- ≥ 2 of these signs or symptoms: 111 (70%)
  - 86 (54%) with both fever and rash
- ≥ 3 of these signs or symptoms: 53 (33%)

http://www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6539e2.pdf
Evolving Spectrum of the Effects of Zika Virus Infection in Pregnancy

• Neuroimaging findings:
  – Intracranial calcifications; ventriculomegaly and extra-axial fluid; abnormal gyral patterns (e.g., polymicrogyria); decreased brain parenchymal volume; cortical atrophy and malformation; hypoplasia of the cerebellum, cerebellar vermis or brainstem; delayed myelination; and thinning or hypoplasia of the corpus callosum.

• Ocular findings:
  – Chorioretinal atrophy or scarring, pigmentary changes, optic nerve hypoplasia, optic disc pallor, increased optic disc cupping, hemorrhagic retinopathy and abnormal retinal vasculature.

• Other:
  – Clubfoot and contractures of single or multiple joints (arthrogryposis), presumably secondary to central nervous system damage
Zika Lab Testing Guidance

Evaluation for Suspected Congenital Zika Virus Infection

Zika Laboratory Testing Guidance

CDPH Zika Virus Testing FAQs for Healthcare Providers

Zika Virus Testing FAQ for Health Care Providers
Who Should be Tested?

**Pregnant Women**

If your patient is
- Experiencing or has recently experienced symptoms of Zika*
- An asymptomatic pregnant woman

Ask the following questions

Does the patient live in or has the patient recently traveled to an area with Zika?

Has the patient had unprotected sex with a partner who has lived in or traveled to an area with Zika?

Test for Zika

**Do Not Test for Zika**

*Photo Source: CDC*
*Newly Updated Resource*

Updated CDC Pregnancy Guide (July 25, 2016)

*New Resource*


Who Should be Tested?

Infants

1) Infants born to mothers with laboratory evidence of Zika virus infection during pregnancy

2) Infants who have abnormal clinical or neuroimaging findings suggestive of congenital Zika syndrome AND a maternal epidemiologic link, regardless of maternal Zika virus test results.

- Laboratory evidence of maternal Zika virus infection: Zika virus RNA detected in any maternal specimen by rRT-PCR, or, positive Zika virus IgM with confirmatory neutralizing antibody titers.
- Congenital Zika syndrome: A pattern of congenital anomalies that includes microcephaly, intracranial calcifications, or other brain anomalies, or eye anomalies, among other findings.

Also consider: Infants born to mothers with risk factors for maternal Zika virus infection (travel/residence in an area of Zika virus transmission or sex with a partner similarly exposed) when maternal testing was not performed before delivery.
Possible Congenital Zika Virus Infection: Initial Clinical Evaluation

Before hospital discharge:

• Comprehensive physical exam
  – Include occipitofrontal circumference, length, weight and gestational age assessment

• Evaluation for neurologic abnormalities, dysmorphic features, splenomegaly, hepatomegaly, rash/other skin lesions

• Cranial ultrasound

• Hearing screen

Additional evaluation specific to clinical presentation
Infants with Laboratory Evidence of Congenital Zika Virus Infection (CZVI): Ongoing Management and Monitoring

Follow-up of infants with laboratory evidence of CZVI depend on presence of abnormalities consistent with congenital Zika syndrome.

<table>
<thead>
<tr>
<th>TABLE 2. Initial evaluation and recommended outpatient management during the first 12 months of life for infants with possible congenital Zika virus infection, based on maternal and infant laboratory tests and infant clinical findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
</tr>
<tr>
<td>--------</td>
</tr>
</tbody>
</table>

- Infants with abnormalities consistent with congenital Zika syndrome:
  - Coordinated evaluation by multiple specialists within the first month of life;
  - Evaluations during first year of life, including assessments of vision, hearing, feeding, growth, and neurodevelopmental and endocrine function.
- Infants without apparent abnormalities:
  - Ongoing developmental monitoring and screening by the primary care provider;
  - Repeat hearing testing.

Families and caregivers will also need ongoing psychosocial support and assistance with coordination of care.
**New Resource**

CDC Infant Evaluation and Management

What are the Recommendations for Couples Planning Pregnancy?

*Updated CDC Guidance October 7, 2016*

No symptoms after exposure:

- Women - Wait at least 8 weeks after last possible exposure to attempt conception
- Men – Wait at least 6 months

Symptoms or Zika virus disease after exposure:

- Women – Wait at least 8 weeks after symptom onset to attempt conception
- Men - Wait at least 6 months

[http://www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6539e1.pdf](http://www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6539e1.pdf)
CDPH Zika Response Activities 2016

Zika case surveillance
- CalRedie
- Laboratory testing for Zika virus infection (in coordination with CDC)

Zika-associated pregnancy outcomes surveillance
- CA Birth Defects Monitoring Program and US Zika Pregnancy Registry

Aedes mosquito surveillance
- Mosquito detection sites map by county

Communication
- CDPH Zika Website
- Outreach Toolkits
- Local Health Jurisdiction conference calls
- E-blasts
- Social Media: Facebook/Twitter/Text4Baby
- Media responses
- Email Inbox for public health/healthcare provider inquiries
California Birth Defects Monitoring Program (CBDMP)

- Statutorily mandated (H&S Code §103825-103850) to collect birth defects data in hospitals, genetic centers and cytogenetic labs in California.

- Active ascertainment, population-based registry of children born in California with congenital and inherited disorders, since 1983.

- Registry data are used to track birth defects trends and evaluate environmental hazards and other possible causes of birth defects.

- Routine birth defects surveillance in 10 California counties:
  Fresno, Kern, Kings, Madera, Merced, Orange, San Diego, San Joaquin, Stanislaus and Tulare.

- Birth defects data collected in tertiary care centers in six additional counties:
  Alameda, Los Angeles, Sacramento, San Bernardino, San Francisco, Santa Clara, are monitored in order to capture cases were children from reporting counties are treated.
Zika-Affected Pregnancy and Infant Surveillance in California

CBDMP routine surveillance for birth defects

CBDMP Zika-associated birth defects surveillance

CBDMP statewide follow-up of all pregnant women and infants with laboratory evidence of Zika virus
Zika-Affected Pregnancy and Infant Surveillance in California

CBDMP routine surveillance for birth defects
Including expedited ascertainment of possible Zika-associated birth defects
- Fresno
- Kern
- Kings
- Madera
- Merced
- Orange
- San Diego
- San Joaquin
- Stanislaus
- Tulare

Expedited ascertainment of possible Zika-associated birth defects
- Alameda
- Contra Costa
- Imperial
- Los Angeles
- Riverside
- San Bernardino
- San Francisco
- San Mateo
- Santa Clara

CBDMP statewide follow-up of all pregnant women and infants with lab evidence of Zika virus
Data collection of all pregnancy outcomes at time of diagnosis, 2nd trimester, 3rd trimester, delivery and 2, 6 and 12 months infant age.

CBDMP has statutory authority to conduct birth defect surveillance throughout California per H&S §103825(a)
Goal: Provide more comprehensive data to complement notifiable disease reporting in order to....

– Inform updates to clinical guidelines
– Plan for services for affected families
– Improve prevention of Zika infection during pregnancy

• Potential data collection points: At diagnosis, 2\textsuperscript{nd} trimester, 3\textsuperscript{rd} trimester, delivery; 2, 6 and 12 months infant age.
  – Laboratory Results Form
  – Maternal Health History Form
  – Assessment at Delivery Form
  – Infant Health Follow Up Form
  – Supplemental Imaging Form

• CDPH/CBDMP compiles data and submits to the CDC Registry
U.S. Zika Pregnancy Registry

• CDPH is the point of contact for reporting data to the CDC.
• CDPH Zika webpage:
  – Instructions for LHD and provider participation in reporting to the US Zika Pregnancy Registry.
  – CDC data forms with coversheets for submission to CDPH.
• CBDMP experts conduct hospital record abstraction for delivery and maternal health history data.
  – Rely on LHD/Zika Case Report for delivery hospital information.
• LHD may elect to defer prenatal and infant follow-up data collection to CDPH.
• Inquiries and communications regarding CDC Registry reporting in CA: ZikaOutcomes@cdph.ca.gov.
CDC Birth Defects Surveillance Reporting

Goal:

– Rapid "real time" active surveillance of microcephaly and CNS malformations with possible association to Zika virus infection for all pregnancy outcomes.

– Data utilization through collaboration with CDC for public health monitoring, prevention, and intervention:
  • Centralized pooled clinical and surveillance data projects.
  • Referral and linkage to services.
  • Evaluation of outcomes of affected children and/or pregnancies with a positive or inconclusive Zika virus test.
CDPH Zika Response Activities 2016: Communications

CDPH Zika Webpage
• Laboratory-confirmed Zika cases in CA (updated weekly)
• Health care provider and general public Q&A
• Health advisories
• Fact sheets (English/Spanish)
• Communications Toolkit
• Downloadable posters
  • Zika and Pregnancy
  • Sex, Bugs...and Zika/Sexual Transmission of Zika
  • Traveling or Studying Abroad

Press Releases/Travel Advisories
• Mosquito bite prevention
• Zika active transmission hot spots
It is important to encourage all Californians to talk, learn and help prevent the spread of Zika virus. Zika infection during pregnancy is linked to birth defects. Zika is BOTH a mosquito- and sexually-transmitted disease—and most infected people don’t know they have it.

To assist your communication efforts, we have developed three toolkits that contain:

- Conversation points, for one-to-one and small-group discussions
- Social media messages (Twitter and Facebook) and related graphics
- Printable, colorful and easy-to-read fliers/posters in Spanish and English
Target Populations

- Programs for Pregnant Women (e.g., MCAH, WIC, CHVP, BIH, AFLP, CPSP)
- Teen Pregnancy Prevention (e.g., I & E, PREP, AFLP)
- Colleges and Universities
- Clinicians – FPACT, Essential Access Health, community clinics, OB/MFM
- Airports/Border Crossings
Zika & Local MCAH

Local Prevention
- Provide consistent and standardized messages
- Ensure accessibility of Zika information, resources and recommendations

Collaboration/Outreach
- Identify and partner with local Communicable Disease, vector control, and other internal and external stakeholders including providers
- Ensure affected pregnant women and infants can access information and services

Mobilization
- Leverage existing resources and community relationships to enhance capacity for surveillance
- Engage community to protect at-risk populations
Key Messages

- Public health risks associated with travel to countries where Zika is circulating must be conveyed to California residents
  - Typically mild illness, *but* risk of microcephaly and other serious brain anomalies and Guillain-Barré syndrome
- No local transmission in CA, however....
  - Transmission is possible, we must be prepared to respond
  - Pregnant and reproductive age women are populations of interest for prevention
  - Ongoing surveillance and control of *Aedes* are critical
  - Individuals with Zika infection must take extra precautions to avoid mosquito bites during the first week of illness to avoid local spread; use repellant for 3 weeks after return
  - Prevention requires a broad community response
Key Messages

• Pregnant women in any trimester should not travel to areas with Zika virus transmission

• For women living in areas with Zika, or with a sexual partner that travels to an area with Zika, it is more important than ever to consider if now is the right time to get pregnant.
  – For couples deciding now is not the right time to get pregnant, use highly reliable contraceptive methods.
  – For those deciding to get pregnant, take important steps to protect against Zika.
Key Messages

- CDC has provided explicit guidance for evaluation of pregnant women, infants, and the clinically ill.
- Healthcare providers should talk to reproductive age women about:
  - Pregnancy intention and reproductive options; reliable contraceptive methods (e.g., LARCs).
  - Potential risks associated with travel and sexual transmission.
- Mothers are encouraged to breastfeed, even in areas with Zika transmission.
  - Benefits of breastfeeding outweigh any theoretical risks associated with Zika virus transmission through breast milk.
Key Messages

• Reduce mosquito breeding sites by:
  – Checking the yard often for water-filled containers.
  – Cleaning and scrubbing bird baths and pet-watering dishes weekly and dump the water from overflow dishes under potted plants and flower pots.
  – Checking that gutters are not holding water.

• Protect against mosquito bites by:
  – Apply EPA-registered mosquito repellents containing DEET, picaridin, IR3535, oil of lemon eucalyptus, or para-menthane-diol to exposed skin and clothing.
  – Wear long-sleeved shirts and long pants when weather permits.
  – Use air conditioning or window/door screens to keep mosquitoes outside or use a mosquito bed net.

• Prevent sexual transmission by:
  – Practicing abstinence or correct and consistent use of condoms with sexual partners who may have been exposed to areas with Zika transmission.

• Prevent health care transmission by:
  – Practicing standard precautions.
Questions?

CDPH Zika Webpage:
http://cdph.ca.gov/zika

Answers to Zika Questions:
JEOCuser43@cdph.ca.gov

Reporting to the US Zika Pregnancy Registry:
• Email: ZikaOutcomes@cdph.ca.gov
• Phone: (510) 620-3151