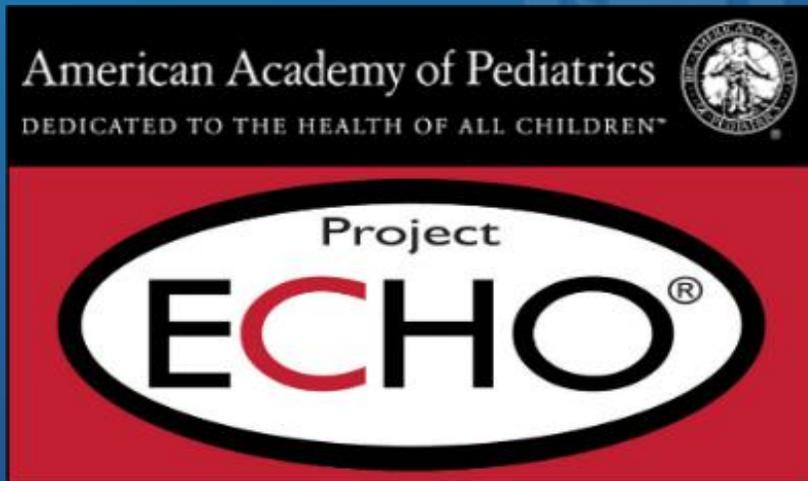


AMERICAN ACADEMY OF PEDIATRICS ZIKA ECHO



American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN®



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Zika Outcomes and Development in Infants and Children (ZODIAC) Project

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January 9, 2018

First Time in History...



“Never before in history has there been a situation where a bite from a mosquito could result in a devastating malformation.”

– Dr. Tom Frieden, Former CDC Director
Fortune, April 13, 2016

Background

- What we know:
 - Most research and publications to date have focused on infants with microcephaly and other neurologic manifestations present at birth
 - Zika virus impairs neural progenitor cells and neural migration, and neurologic sequelae may develop over time
- What we don't know:
 - The long-term effects of congenital Zika virus infection or more subtle clinical findings associated with congenital Zika virus infection

What is known about delayed effects of other congenital infections

- CMV: Delayed sensorineural hearing loss, cognitive deficit, chorioretinitis, seizures¹
- Rubella: Delayed neurologic and ophthalmologic sequelae, hearing loss, endocrinopathies²
- Toxoplasmosis: Delayed neurologic sequelae³
- HIV: Delayed neurologic sequelae⁴

1. Fowler et al. 1992. The Outcome of Congenital Cytomegalovirus Infection in Relation to Maternal Antibody Status
2. Sever et al. 1985. Delayed manifestations of congenital rubella
3. Sever et al. 1988. Toxoplasmosis: maternal and pediatric findings in 23,000 pregnancies
4. Diamond et al. 1987. Characterization of cognitive functioning in a subgroup of children with congenital HIV infection

Zika Outcomes and Development in Infants and Children (ZODIAC)



- Follow up assessment of babies aged 12-24 months with congenital ZIKV infection in two Brazilian states: Paraíba and Ceará
- Collaboration between CDC's National Center on Birth Defects and Developmental Disabilities and Center for Global Health, and Brazil's Ministry of Health

Creating a Comprehensive Picture

■ Expertise—CDC Staff

- Developmental Pediatrics, General Pediatrics, Pediatric Neurology
- Neuroscience, Audiology, Ophthalmology, Behavioral Health
- Epidemiology, Statistics

■ Data Sources

- Medical record abstraction
- Neurologic and developmental assessments
- Caregiver interview
- Physical exam, including laboratory tests
- Ophthalmologic exam
- Other exams as clinically indicated (e.g., auditory, neuroimaging)



MMWR – Published December 14, 2017

Morbidity and Mortality Weekly Report

Health and Development at Age 19–24 Months of 19 Children Who Were Born with Microcephaly and Laboratory Evidence of Congenital Zika Virus Infection During the 2015 Zika Virus Outbreak — Brazil, 2017

- Comprehensive description of the health and development of 19 children, ages 19-24 months, with microcephaly and laboratory evidence of congenital Zika virus infection
 - Based on direct clinical assessments, caregiver interviews, and medical record review

MMWR

Investigators found that, of the 19 children:

11 had indications of **possible seizure disorder**

10 had **sleep difficulties**

9 had **feeding difficulties** (e.g. trouble swallowing)

13 had **hearing problems** (e.g. not responding to sound of a rattle)

11 had **vision problems** (e.g. not being able to follow a moving object with their eyes)

15 had **severe motor impairments**, including inability to sit independently

14 had **at least three of these challenges**, complicating their care

8 had been **previously hospitalized**, with bronchitis/pneumonia being the most commonly reported reason for hospitalization (**6 of the 8**)

How ZODIAC May Help in the Future

Tools and training from ZODIAC may be useful to:

- Build sustainable screening protocols in clinical practices
- Raise awareness of less salient or delayed onset consequences of congenital Zika that may otherwise be missed
- Track at-risk children's health and development over time

ZODIAC data may help inform:

- Preparedness efforts, public health policies and programs related to congenital Zika virus infection
- Response to emerging threats to children's health and development

Moving forward...

- Children affected by Zika virus will continue to require specialized care from various healthcare providers and caregivers as they age
 - Important that health care providers work closely with parents to provide this care and support
- Must remain vigilant in our Zika prevention efforts both in the United States and around the world, especially for pregnant woman
- This work will provide critical scientific information to help countries prepare for the unprecedented challenges posed by Zika virus infection

Thank you!

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

