National Center on Birth Defects and Developmental Disabilities

Lessons Learned:
U.S. Zika Pregnancy & Infant Registry

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Meeting: Challenges in Initiating and Conducting Long-Term Health Monitoring of Populations Following Nuclear and Radiological Emergencies in the United States

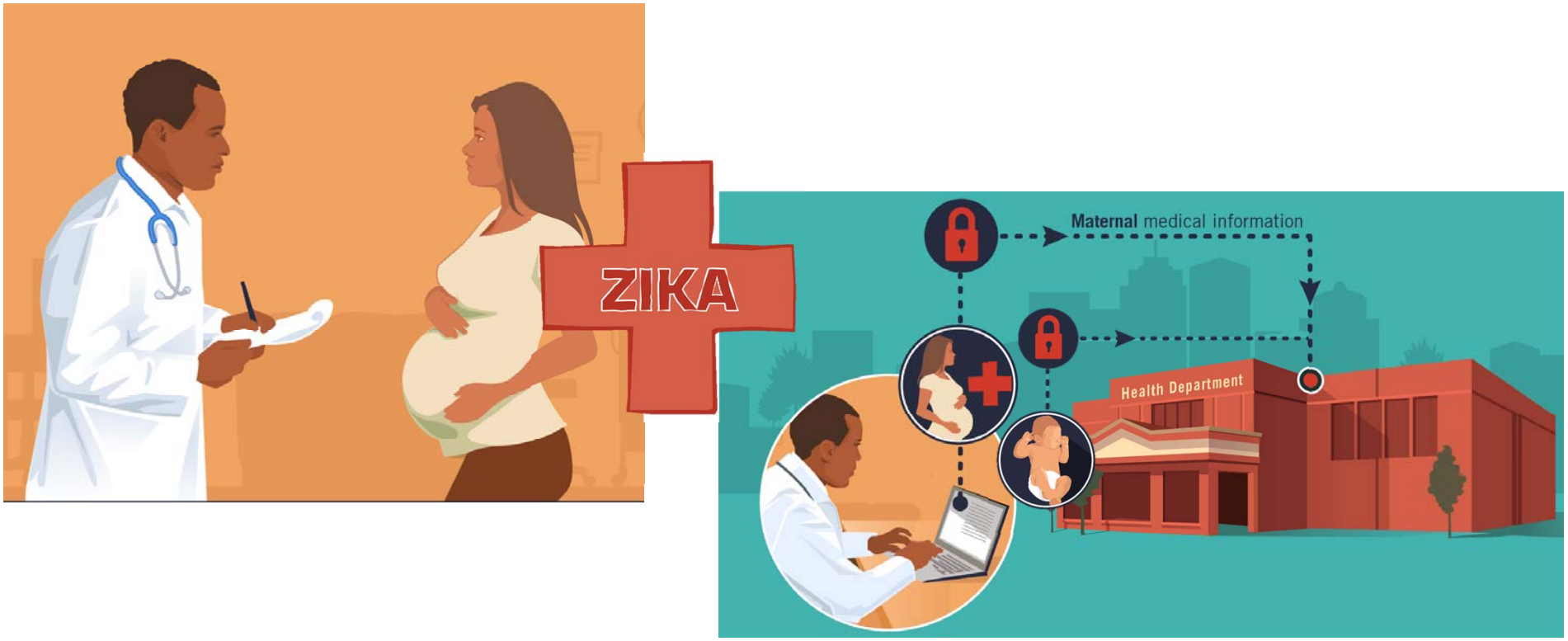
Convened by: National Academies of Science, Engineering, and Medicine

Date: March 12, 2019

US Zika Pregnancy & Infant Registry

- Established in early 2016 in all US states and territories
- Monitors pregnancy and infant outcomes in pregnancies with laboratory evidence of possible Zika virus infection to inform clinical guidance and public health response
  - Estimate the proportion of fetuses and infants with birth defects
  - Provide information to inform the phenotype of congenital Zika syndrome
  - Facilitate referral to care for infants with possible congenital Zika infection
- Over 7,400 pregnancies with lab evidence of possible Zika virus infection in US states and territories (pregnancies completed Dec. 2015 through March 2018)
- Follows infants to at least **2 years of age**

Tracking Zika in Pregnant Women and Infants



How did it work?

US Zika Pregnancy & Infant Registry

US Zika Pregnancy & Infant Registry: How It Works

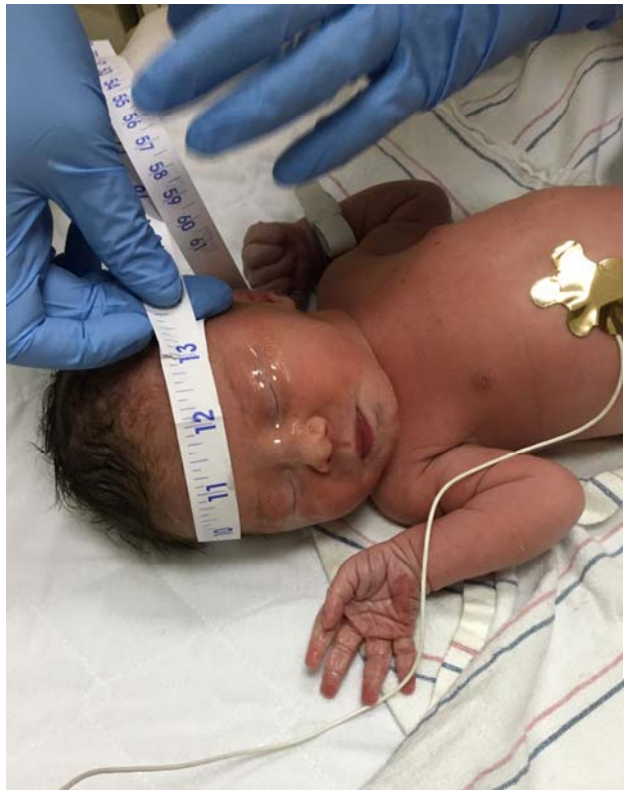
- **Identification:** Health departments identify pregnant woman with Zika virus infection from healthcare providers and/or positive Zika test result
- **Data Collection:** Health departments abstract key data elements and submit to the US Zika Pregnancy & Infant Registry
- **Data Analysis & Reporting:** CDC receives data from health departments, aggregates and analyzes, regularly reporting data on CDC's website during outbreak
- **Publication:** Data Use Working Group (consisting of CDC and health department partners) jointly prioritize and publish results

US Zika Pregnancy & Infant Registry: Data Collected

- **Maternal** Health and Pregnancy Data
  - Demographics
  - Zika virus exposure history, including travel
  - Zika virus testing results
  - Health history and pregnancy information
  - Prenatal imaging
  - Prenatal testing
  - Pregnancy outcome

US Zika Pregnancy & Infant Registry: Data Collected

- **Neonatal** Assessment
  - Physical examination
  - Neonatal imaging
  - Zika virus testing
  - Other testing (e.g., infectious diseases, cytogenetics)
  - Hearing screening
  - Eye exam



US Zika Pregnancy & Infant Registry: Data Collected

- **Infant** follow-up at 2, 6, 12, 18, & 24 months of age
  - Physical exam findings
  - Developmental assessment
  - Additional studies
  - Neuroimaging, hearing evaluation, retinal exam, consultations

Reporting Data to the Registry

- US Zika Pregnancy & Infant Registry data types:
  - Line Lists
  - USZPR Forms
  - Electronic Data exchange – Access Database, Local REDCap, etc.
- Accepted secure methods of Registry data transfer:
  - Phone
  - SAMS
  - FTP
  - Fax

Lessons Learned

US Zika Pregnancy & Infant Registry

Challenges in Zika Pregnancy and Infant Surveillance

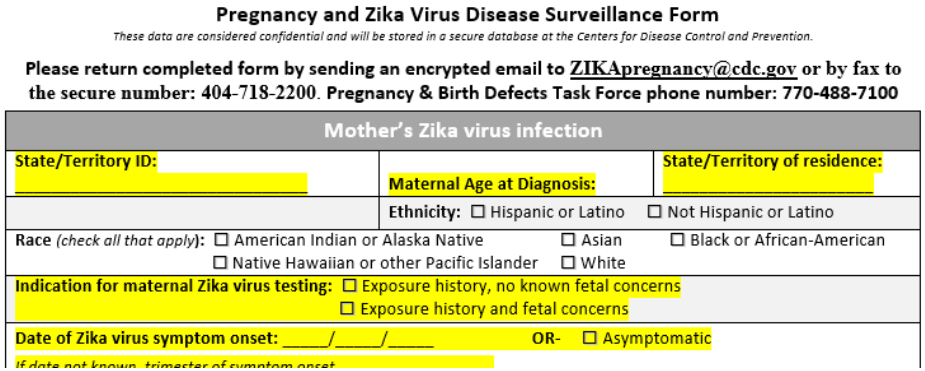
- Asymptomatic infection
  - Tension between traditional case-definitions (requiring symptoms) and importance of tracking infected but asymptomatic pregnant women
- Time delay from infection in pregnancy to outcome
  - Early information allowed monitoring of numerator data of infected pregnant women, but risk of infection couldn't be estimated before pregnancy completion
- Testing/diagnostics
  - Testing capacity at state and local level
  - Transient nature of virus
  - Lack of knowledge about definitive diagnostics in utero

Data Protection via Assurance of Confidentiality

- Assurance of Confidentiality:
  - Special protection for identifiable information in the Registry
  - A formal confidentiality protection authorized under Section 308 (d) of the Public Service Act
- Under this Assurance
  - CDC cannot share information that could be used to identify patients and providers without their permission
  - Data can only be used to better understand Zika virus infection during pregnancy and its outcomes
- **Data reporting was voluntary**
  - **Healthcare providers and health departments felt confident that data were protected, which facilitated collaboration and reporting**

Linked Mother-Baby Surveillance: Easy Access System

- Implemented a system that was easy and accessible for all jurisdictions to report data consistently
  - Data accepted in multiple formats
- Functionality to link data from pregnant woman with infant
- Clinical review or reported data by subject matter experts



Pregnancy and Zika Virus Disease Surveillance Form

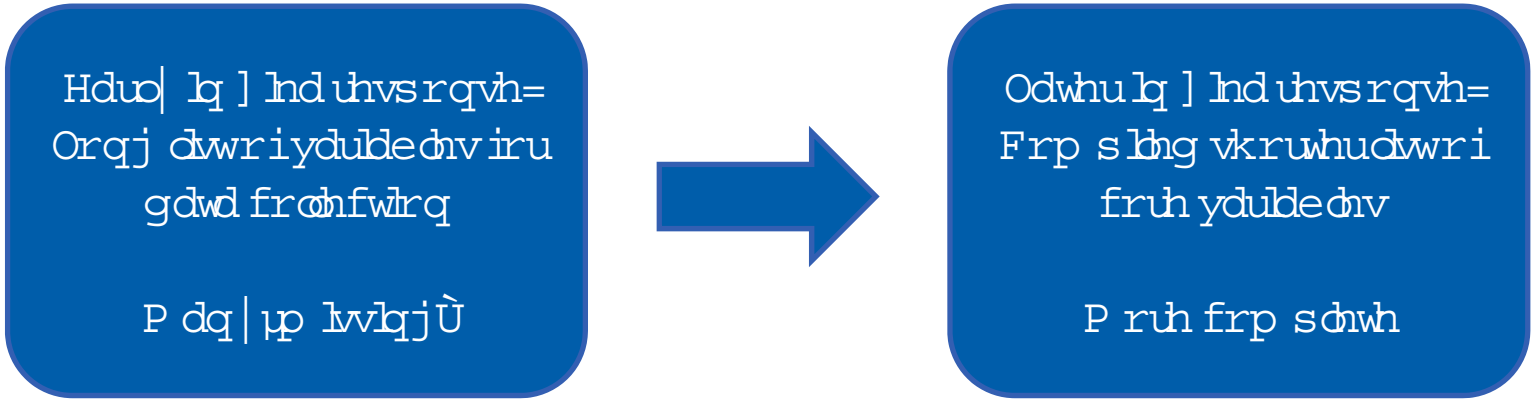
These data are considered confidential and will be stored in a secure database at the Centers for Disease Control and Prevention.

Please return completed form by sending an encrypted email to ZIKApregnancy@cdc.gov or by fax to the secure number: 404-718-2200. Pregnancy & Birth Defects Task Force phone number: 770-488-7100

Mother's Zika virus infection		
State/Territory ID:	**Maternal Age at Diagnosis:**	**State/Territory of residence:**
	Ethnicity: ☐ Hispanic or Latino ☐ Not Hispanic or Latino	
Race *(check all that apply)*: ☐ American Indian or Alaska Native ☐ Native Hawaiian or other Pacific Islander	☐ Asian ☐ White	☐ Black or African-American
Indication for maternal Zika virus testing: ☐ Exposure history, no known fetal concerns ☐ Exposure history and fetal concerns		
Date of Zika virus symptom onset: _____/_____/_____ **OR-** ☐ Asymptomatic		
If date not known, trimester of symptom onset		

REDCap
Research Electronic Data Capture

Standardized Core Variables



- Moving forward: Developing list of core variables for surveillance of exposures during pregnancy

Modules to Address Specific Health Threats

- Because long-term sequelae of congenital infection unknown, unsure of outcomes for data collection
  - Started with microcephaly, but surveillance cohort approach allowed us to follow-up for any potential outcomes
- Moving forward: Developing modules to address specific health threats
  - Environmental exposures
  - Infectious diseases

Loss to Follow-Up

- Mobility
  - Families move and often seek care from different pediatric providers
  - Hurricanes that hit Caribbean resulted in challenges to follow-up of infants with possible congenital Zika infection
- Moving forward:
  - Working across jurisdictions to find families and follow-up infants, with data sharing between jurisdictions
  - Clinical outreach to pediatric providers to encourage them to ask parents about possible Zika exposure during pregnancy

Data from the US Zika Pregnancy and Infant Registry

About **5-10%** of infants born to women with possible Zika infection had Zika-related birth defects and another **8-10%** had neurodevelopmental disabilities potentially related to Zika

Identified that Zika infections during **all trimesters** have been associated with birth defects

Revealed no discernable differences between **symptomatic versus asymptomatic** maternal infection in impact to their babies

Recognized pattern of **birth defects** associated with prenatal Zika virus infection

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