

Pregnancy care as an opportunity for a sustainable population-based surveillance system: our experience in building research capabilities in Honduras

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Epidemiologic surveillance systems

- Provide valid, reliable, and timely information
- Support planning, implementation and evaluation of public health interventions and programs
- **Active surveillance**
complements routine passive surveillance

Challenges for effective active surveillance

- Requires certain level of organization, logistics and infrastructure
- Time, cost and other resources
- Resource constrained setting
- Epidemic, pandemic times

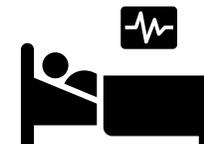


Background

Pregnancy care: an opportunity for sustainable population-based surveillance

Prenatal and delivery care offer a unique opportunity to collect population-based data.

- Umbilical cord blood samples: collected from birth to perform specific pathogen testing and other analyses.
- Collecting cord blood from the placental side after cutting the cord: non-invasive.
- IgG antibodies cross the placenta: maternal antibodies can be measured in cord blood



Background

Experience in building research capabilities in Honduras

- Geographic rapid spreading
- Exposure: often asymptomatic
- Diagnostic challenges
- Unknowns: Zika or Dengue?
Frequency of microcephaly?
Impact on neurodevelopment?

- Timely protocol preparation and IRB approval
- Resources

- Sustainability

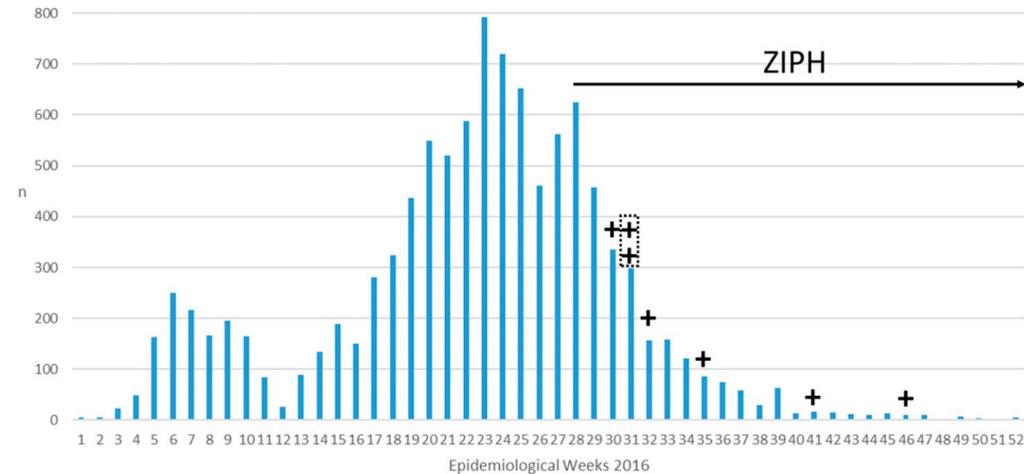
**Zika epidemic in Honduras
2016**

**COVID-19 pandemic
2020**

Results and Conclusions

ZIPH study: Zika Infection in Pregnant women in Honduras

- **2016, July – Dec.** 667 enrolled pregnant women.
- **Trioplex rRT-PCR** in 357 serum samples taken at the first prenatal visit. ZIKV confirmed in 7 pregnancies (7/357, 2.0%).
- **Microcephaly** (HC >2SDs below the mean): 9 infants (1.6%); 2 (0.3%) with severe microcephaly (HC >3SDs below the mean), both mothers had evidence of ZIKV infection.



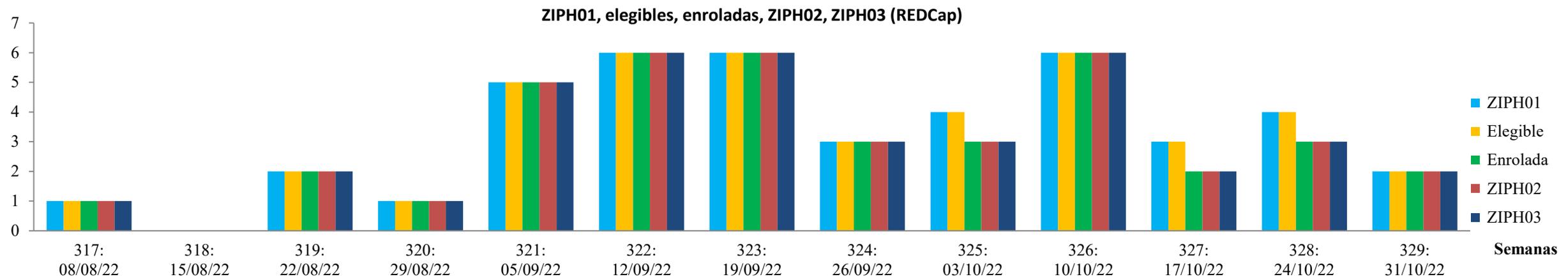
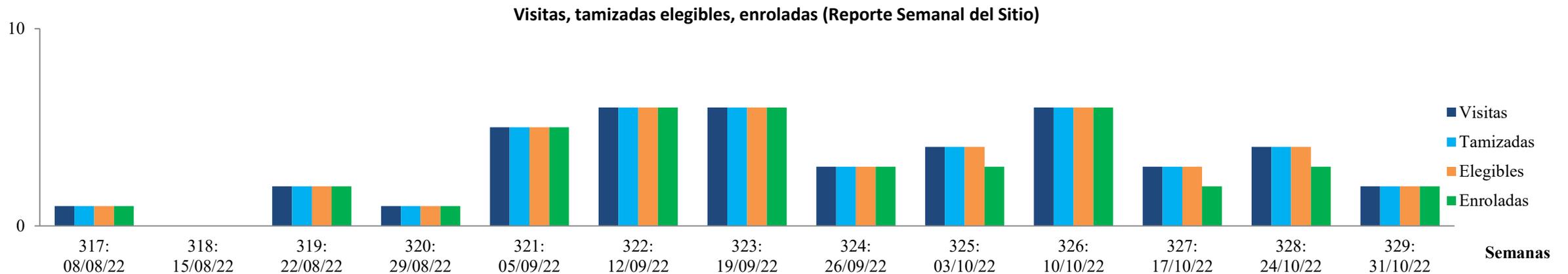
Neurodevelopment assessments

- 152 normocephalic children (May 2018–March 2020).
- Mean age 2.0 years; >93% adequate anthropometric growth.
- 60 children exposed to ZIKV during pregnancy (manuscript in preparation).

Results and Conclusions

Currently enrolling

2022, October: 4880 enrolled pregnant women, blood sample at first prenatal visit. Follow up rate at birth: 94%.



Results and Conclusions

Experience in building research capabilities in Honduras

- Building trust
- Increasing capabilities: scallation
 - Data collection
 - Sample collection and storage

- Integration of interdisciplinary, interinstitutional and international collaboration
- Diagnostic capabilities
- Training: on-site and international
 - Standard Operative Procedures Manual and guidelines*
 - Digital training: RedCap*
 - Scales for neurodevelopment assessment*

- Low intensity modality
- Pre-pandemic samples: test specificity of RDTs
- ZIPH: Zero Infection in Pregnant women in Honduras.

**Congenital Chagas Disease
2005-2016**

**Zika epidemic
2016**

**COVID-19 pandemic
2020**

- Am J Trop Med Hyg. 2008 Nov;79(5):755-9. PMID: 18981518.
- Reprod Health. 2013 Oct 11;10:55. PMID: 24119247; PMCID: PMC3852796.
- Am J Trop Med Hyg. 2018 Feb;98(2):478-485.PMID: 29210352.

- Matern Child Health J. 2020 Sep;24(9):1099-1103. PMID: 32671537.

Relevant activities

- IRB approval: national and international
- Protocol publication
- Facilitating broad participation in article authorship
- Sustainability of the cohort by its potential to provide information on neonatal outcomes and/or diagnostic challenges: Zika, syphilis, American trypanosomiasis, dengue, chikungunya, COVID-19

Process and Challenges

Buekens et al. *Reproductive Health* (2016) 13:82
DOI 10.1186/s12978-016-0200-6

Reproductive Health

STUDY PROTOCOL

Open Access

Zika virus infection in pregnant women in Honduras: study protocol

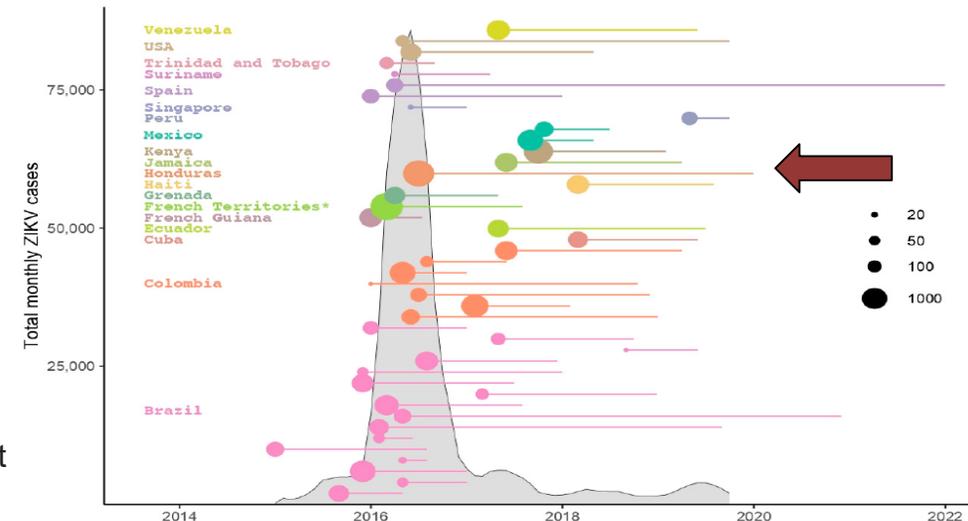


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Microcephaly Outcomes among Zika Virus–Infected Pregnant Women in Honduras

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