BIOS 755- Midterm Project Abstract

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Longitudinal analysis of Head Growth Among Infants with Congenital Zika Virus Exposure

Background:

Zika virus is an arboviral disease that can be passed in utero from a woman to her fetus and result in serious birth defects including microcephaly at birth.[1-7] Microcephaly is a condition where the baby's head is much smaller than expected and can occur due to abnormal brain development.[1] The virus is primarily spread through the bite of an infected Aedes aegypti mosquito but can also be spread sexually even when symptoms aren't present.[1] Adverse birth outcomes including microcephaly have been consistently associated with in-utero Zika virus exposure[1-7] but studies on long-term infant health outcomes are limited.

Florida was highly impacted by the ZIKV activity in the Americas, with over 1,300 imported cases reported in 2016-2017 alone as well as local mosquito-borne transmission.[8] Through a coordinated response, the Florida Zika Pregnancy and Infant Registry (FZPIR) was initiated to monitor pregnancies with confirmed or probable laboratory evidence of ZIKV infection. Surveillance activities for the FZPIR are conducted through collaboration of the Florida county health departments, the Florida Bureau of Epidemiology, and the Florida Birth Defects Registry.

Methods:

Epidemiological and Zika virus testing data were obtained from the Florida Department of Health reportable disease reporting system. Cases were classified per the Council of State and Territorial Epidemiologists (CSTE) case definition as confirmed or probable. All pertinent medical record data was collected by trained abstractors and entered into the Zika-Related Birth Defects Database including: maternal prenatal records, maternal delivery records, infant birth records, and five infant pediatrician visits for months 2,6,12,18, and 24. Pregnancies identified through the FZPIR were included if a birth outcome occurred in Florida between 1/1/2016-3/31/2018 and the infant had a birth head circumference and five follow-up measurements for a total of six head circumference measurements (N= ?).

First, descriptive statistics will be performed to describe the maternal and infant characteristics of the study sample. Then, we will utilize a linear mixed methods approach to account for subject-specific trajectories and the unbalanced study design. Various covariance structures for unbalanced data will be assessed to determine the best model fit using AIC and BIC. We will also compare average head growth between Zika virus exposure groups (confirmed vs. probable) to determine if interaction is present and if there are differences in mean head growth.

Amanda Elmore serves as the data manager for the Zika-Related Birth Defects Database and performs data collection as well as data cleaning. For this project, she performed the background research, determined sample inclusion, developed the research plan, and will perform all statistical analysis in SAS.

References

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