Seasonal Variations in Fetal Growth Patterns in Ulaanbaatar City, Mongolia

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Background: Ulaanbaatar, the capital city of Mongolia sees some of the world’s most extreme seasonal variability in climate and air pollution levels. In the winter months, temperatures can drop to −40 °C and particulate matter and gaseous pollutant concentrations at this time can exceed over 20 times WHO standards. In the summer months, air pollution levels are low and temperature extremes can reach up to +33 °C. This cross-sectional study examines whether there are seasonal variations in fetal growth patterns on prenatal ultrasound evaluations given these extreme environmental fluctuations.

Methods: We collected measurements from 4373 fetal ultrasounds from three antenatal care clinics in Ulaanbaatar, Mongolia from March to July 2016. Biparietal diameter (BPD), abdominal circumference (AC), and femur length (FL) growth parameters were estimated from each sonographic evaluation. Z-scores were calculated for each measurement using published norms by weeks gestation. Season of conception was grouped in tertiles: Winter (November to February), Spring (March to June), Summer (July to October). The impact of season of conception on second and third trimester ultrasound Z-score measurements was assessed with two-way ANOVA with interaction at a 0.05 significance level.

Findings: There were significant differences in FL, BPD and AC by season of conception. FL Z-score (p = 0.033, Winter > Spring), BPD Z-score (p = 0.011, Winter < Summer), and AC Z-score (p = 0.014, Winter < Summer). BPD Z-score also differed by trimester of pregnancy (p = 0.0002, Trimester 1 < Trimester 3). AC Z-score did not differ by season of conception, but did differ by trimester (p = 0.0003 Trimester 2 > Trimester 3).

Interpretation: Our preliminary findings suggest that there are seasonal patterns in fetal growth in Ulaanbaatar, Mongolia. To our knowledge, this is the first study on seasonal variations in fetal growth patterns in Mongolia. These findings will help to better understand environmental changes on fetal growth, and to develop interventions to reduce adverse fetal and birth outcomes.

Source of Funding: Children’s Hospital Los Angeles Pediatric Residency Program IMPACT Global Health Track. Support was also provided by an NIH Fogarty International Center/National Institute of Environmental Health Sciences DE43 grant.

Abstract #: 2.006_PLA

The Effects of Early Childhood Development Centers on Child Development and Nutritional Outcomes in Estancia, El Salvador

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Background: In El Salvador, it is estimated that 35% of households live in multidimensional poverty with limited access to education, adequate nutrition, and economic opportunities. Poverty is known to affect child development and educational outcomes. An estimated 25% of three and four-year children in El Salvador have a low Early Childhood Development Index (ECDI) score. Doctors for Global Health partnered with a local non-governmental organization, Asociación de Campesinos para el Desarrollo Humano (Peasant Association for Human Development, CDH), and facilitated the creation of Centers for Integrated Child Development (CICD) for children two—six years of age; children receive a curriculum that includes motor, language, and socio-emotional activities