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### **“Pilot Study for a Ecological Comparison between Maternal Residence and Cleft Palate Prevalence”**

Orofacial clefts are a common congenital anomaly within the United States but is seen with a higher prevalence in Louisiana when compared nationally. Orofacial clefts result from improper folding of the lateral and medial nasal processes during early embryological development leaving a sinus between the nose and lips or nasal cavity and oral cavity. The process is thought to be multifactorial, involving various genetic and environmental factors which include teratogens such as: phenytoin, valproic acid, thalidomide, dioxin, tobacco, alcohols, and pesticides. The agricultural sector and chemical production are a large portion of Louisiana's industry which contributes to increases in pollutants surrounding the plants or fields. Higher prevalence of orofacial clefts in Louisiana suggests environmental factors from these industries impact Louisiana residents and their children.

The Louisiana Department of Health (LDH) provides a Health Data Explorer which overlays National Ambient Air Quality Standards and Louisiana Birth Defect Monitoring Network (LBDMN) data onto a map of Louisiana divided by regions or parish. The data analyzed focused on the years from 2015 to 2017.

Northwest, Acadiana, and Northeast regions have the highest prevalence of the 9 regions for the cumulative orofacial cleft data (cleft lip and palate, cleft palate without lip, and cleft lip without palate) with 22.82, 20.92, and 20.35 per 10,000 live births respectively. The Northeast region has the highest incidence of cleft lip and palate with 7.99, and the Northwest has the highest incidence of cleft lip without palate and cleft palate without lip with 5.59 and 13.04 respectively. The Northeast region has the highest concentration of air pollution by parish containing 6 parishes of the 10 parishes with the highest pollution. The Baton Rouge and Northshore regions contain the remaining 4 parishes with the highest pollution.

Aligning with our hypothesis, the areas in Louisiana with increased prevalence of orofacial clefts corresponds to the parishes with increased levels of air pollution most exemplified in the Northeast region. Plans to expand on this pilot study have begun, and this project has partnered with the LDH for comprehensive data from 2005 to 2020 detailing cleft information, determinants of health, and zip code/census code of maternal residence at time of birth. LDH and LSUHSC will combine resources by creating an integrated team with members from LDH LBDMN, LSUHSC Public Health Faculty, a LSUHSC Craniofacial Pediatrician, and a LSUHSC student.