

**AAP DISTRICT VIII SECTION ON NEONATAL PERINATAL MEDICINE**

**2021 ANNUAL CONFERENCE ORIGINAL RESEARCH (BASIC SCIENCE or CLINICAL)  
ABSTRACT SUBMISSION FORM**

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**DEADLINE FOR RECEIPT OF ABSTRACT IS FEBRUARY 19, 2021.** Submissions will be accepted for either poster or oral presentation. Authors will be notified of acceptance and format for presentation (poster or poster symposium) by **March 12, 2021.**

**Title:** Impact of Social Determinants of Health on Riley NeuroNICU Infant Follow Up

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**Background:** Socio-economic determinants of health (SEDH) greatly impact medical outcomes. Research is being pioneered and individual studies have seen a relationship between maternal education and race and neurodevelopmental follow up and outcomes among neonates (Joseph *et al*; Swearingen *et al*). These factors are intertwined with lower socio-economic status (SES) in which low SES has been related to poorer outcomes (Joseph *et al*). Not only do these factors correlate to lower SES, but they also relate to psychological distress which is associated with poorer neurocognitive outcomes (Yaari *et al*). The effect of SES on long-term neurodevelopmental outcomes on infants requiring neonatal neurointensive care is not well studied. Research on demographic factors that influence neonates in the state of Indiana need to be further characterized to argue for improved resource allocation such as that seen in other states' Medicaid organizations (Honsberger *et al*). By focusing on the NeuroNICU population, improvement in long term neurodevelopmental outcomes of infants at the greatest risk can be achieved.

**Methods:** A retrospective chart review was performed. Infants admitted to the NeuroNICU within a 60 acute bed level IV NICU in Indianapolis, IN from November 2013-June 2020 were included. Patients were divided into "Show" and "No Show" groups based on first follow up visit with the NeuroNICU. Infants with at least one diagnosis in the ICD-10 diagnostic group associated with a neurologic condition were included. The only exclusion criterion was if the infant died prior to discharge from the hospital. Maternal demographics, socio-economic data (race, ethnicity, preferred language, education, employment status, marital status, zip code, extrapolated average income from zip code, and insurance type), and infant characteristics and outcomes were obtained. To test differences by study group, we used chi square tests for categorical variables and t test for continuous variables. A p value < 0.05 was considered significant. Data management was conducted using REDCap 10.0.33 and SAS 9.4.

**Results:** A total of 952 infants were screened of which 124 died prior to discharge and 828 were eligible. Of these, follow up data has been collected for 647 with 603 patients scheduled with the NeuroNICU for follow up. No show rate was 23.9% at first follow up visit. Reasons were given for 38/144 no shows which included the infant being re-hospitalized (40%), parents wanting to coordinate with other appointments (25%), MD unavailable (17.5%), transport issues (5%), infant/parent sick (2.5%), infant died (2.5%), and parent forgot (2.5%). Of the characteristics of infants in the "No Show" category they were usually black (p = 0.05), had longer hospital stays (p=0.03), had public health insurance (p=0.005), and were discharged to zip codes with lower average incomes (p=0.05). There was no statistically significant difference between maternal education in the two groups.

**Conclusion:** Previous research that explored the relationship between socio-economic factors and neurodevelopmental outcomes in neonates has shown a correlation between lower SES factors (such as maternal education and race) and higher risk for long-term neuroimpairments. Our study is novel as it focuses on the most vulnerable population: NeuroNICU infants. Our study population had an attrition rate similar to past literature (Tang *et al*; Nehra *et al*) with a high proportion of missed appointments due to the infant being re-hospitalized. There was a statistically significant higher number of black infants and infants on public health insurance in the "No Show" study group as well as a significantly lower zip code-based annual household income in the "No Show" group compared to infants who followed-up. Our findings suggest racial and socio-economic disparity impact the ability to follow-up. Future work includes mixed predictive model analysis to better define the SES combined models with the highest risk for attrition at follow-up. We plan to further explore how knowledge gained from this study can fuel future interventions to improve outpatient clinic operations and strategies to expand access to care. The state of Indiana could use these findings to identify and screen infants like the Medicaid managed programs implemented in North Carolina, Kansas, and Oregon (Honsberger *et al*) to better allocate services and make the largest impact on Indiana NeuroNICU infants' health.

## Resources:

1. Honsberger, K., Tanga, A. M., & Eichner, H. Identification and Screening of Social Determinants of Health among Children with Special Health Care Needs in Medicaid. National Academy for State Health Policy. 2020.
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3. Nehra V, Pici M, Visintainer P, Kase JS. Indicators of compliance for developmental follow-up of infants discharged from a regional NICU. *J Perinat Med*. 2009;37:677-81
4. Swearingen, C., Simpson, P., Cabacungan, E. *et al*. Social disparities negatively impact neonatal follow-up clinic attendance of premature infants discharged from the neonatal intensive care unit. *J Perinatal* 40, 790-797 (2020). <https://doi.org/10.1038/s41372-020-0659-4>
5. Tang BG, Lee HC, Gray EE, Gould JB, Hintz SR. Programmatic and administrative barriers to high-risk infant follow-up care. *Am J Perinatol*. 2018;35:940-5.
6. Yaari, M (PhD), Treyvaud, K (D Psych), Lee, KJ (PhD), Doyle, LW (MD), Anderson, PJ (PhD), Preterm Birth and Maternal Mental Health: Longitudinal Trajectories and Predictors, *Journal of Pediatric Psychology*, Volume 44, Issue 6, July 2019, Pages 736-747. <https://doi.org/10.1093/pepsy/isz019>