Associations of Community Material Neighborhood Deprivation With the Diagnosis of Asthma Among Infants With Bronchopulmonary Dysplasia (BPD)

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Objective
To quantify associations of the community-level material deprivation index (CMDI) with asthma diagnosis by age 5 years among preterm infants with bronchopulmonary dysplasia (BPD).

Methods
We conducted a retrospective cohort study of preterm infants with BPD, born between 2010 and 2019, discharged from a single hospital system to a home address in the Philadelphia metropolitan area, with documented follow-up in the Children's Hospital of Philadelphia Care Network through 5 years of age. Patient charts were reviewed for asthma diagnoses, identified by ICD-10 codes. We geocoded each patient's address at time of neonatal intensive care unit (NICU) discharge to assign census tract CMDI values (range 0 to 1). Multivariable logistic regression models quantified associations of CMDI with asthma diagnosis by age 5 adjusting for patient-level factors.

Results
Of the 337 preterm infants with BPD and 5-year follow-up within the CHOP Care Network, 169 (50%) were diagnosed with asthma by age 5. CMDI was higher among infants diagnosed with asthma compared to those without asthma (0.43 vs 0.38, p = 0.002). Per standard deviation increment of CMDI, infants had 34% and 32% higher odds of asthma diagnosis in unadjusted (OR 1.34, 95% CI: 1.11, 1.62) and adjusted (aOR 1.32, 95%CI: 1.05–1.65) models, respectively.

Conclusions
Among an urban population of former preterm infants with BPD, high rates of asthma by school age were noted and higher neighborhood deprivation was associated with asthma diagnosis by age 5 years.

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