The Association Between Neighborhood Factors and Early Organ Dysfunction in Children Who Are Critically Ill: A Retrospective Cohort Study

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Objective
To explore potential associations between neighborhood-level factors and early organ dysfunction in children who are critically ill.

Study design
This retrospective, ecological cohort study assessed the association between neighborhood factors and early organ dysfunction in 8289 encounters for children who were critically ill from January 2013 to December 2019 at a quaternary pediatric hospital in an urban setting. The exposures were neighborhood factors, which were measured using 3 composite indices: Child Opportunity Index (COI), Social Vulnerability Index (SVI), and Neighborhood Disorder Index (NDI). Peak Pediatric Logistic Organ Dysfunction [PELOD]-2 scores in the first 72 hours measured early organ dysfunction as the primary outcome. An adjusted Poisson regression with robust modeling was used to measure the association.

Results
Most encounters were for patients from very low opportunity (28%), very high vulnerability (29%), and very high physical disorder neighborhoods (27%). Median peak PELOD-2 score was 3 (interquartile range 2-5). No association was identified for COI or NDI with peak PELOD-2 scores; however, there was an association between a very high SVI and greater peak PELOD-2 scores (P = .004).

Conclusions
No association was found among COI or NDI with worse early organ dysfunction. Very high SVI was associated with worse early organ dysfunction. Further studies should assess whether specific aspects of neighborhoods drive critical illness in organ-specific diseases.

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Authors: Magee P, Paquette E, Daniels L, Sanchez-Pinto LN, Yehya N

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