



# Maternal Stress and Depression Associations with Respiratory Phenotypes, Allergic Sensitization, and Respiratory Illnesses in Urban Children

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## BACKGROUND & OBJECTIVE

**Background:** Mothers living in the inner-city have a high prevalence of stress and depression.

•Prenatal and early life exposure to maternal stress and depression is linked to the development of recurrent wheezing in young children.

**Objective:** We sought to determine whether maternal stress and depression in early life is associated with respiratory phenotypes based on allergies, wheezing and lung function in high risk, urban children.

## METHODS

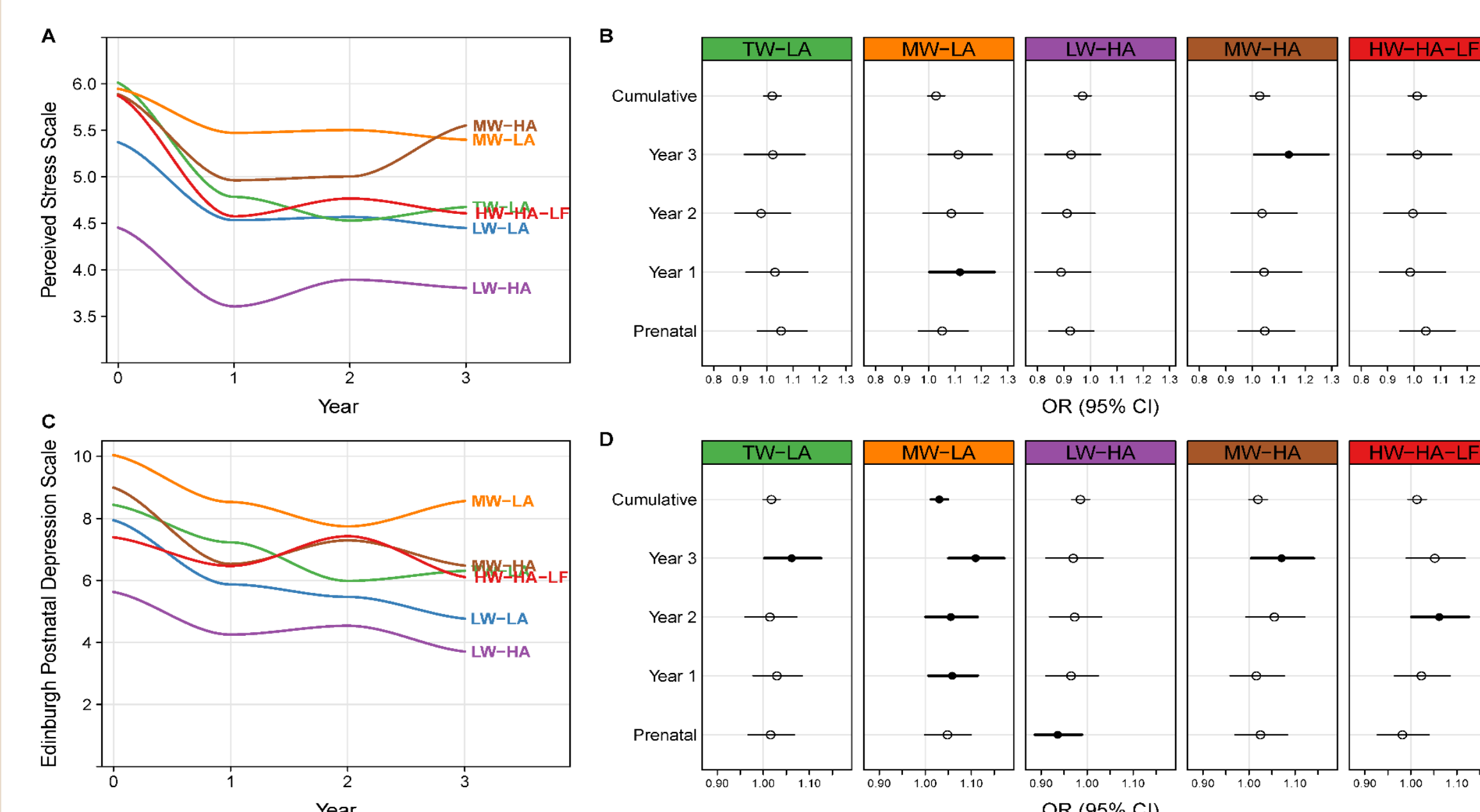
- The Urban Environment and Childhood Asthma Study examined a birth cohort of children at high risk for asthma residing in low-income urban neighborhoods.
- Latent class mixed modeling was used to identify six respiratory phenotypes through age ten years using longitudinal trajectories of wheezing, atopy, and lung function.
- Six respiratory phenotypes were identified: 1) low wheeze-low atopy (**LW-LA**), low to minimal wheezing and low to minimal allergic sensitization; 2) low wheeze-high atopy (**LW-HA**), intermediate allergic sensitization that increased over time and little or no wheezing; 3) transient wheeze-low atopy (**TW-LA**), wheezing in early life that resolved early and with minimal allergic sensitization; 4) moderate wheeze-low atopy (**MW-LA**), wheezing that diminished over time and little or no allergic sensitization; 5) moderate wheeze-high atopy (**MW-HA**), wheezing that diminished over time with allergic sensitization, and 6) high wheeze-high atopy-low lung function (**HW-HA-LF**), high rate of wheezing illnesses with allergic sensitization and airway obstruction.
- Prenatal and early life (through age three years) maternal stress and depression scores were analyzed as predictors of respiratory phenotypes at age 10 (logistic regression), number of self-reported colds (linear regression) and detection of respiratory viruses (Poisson regression).

**Main Findings:** Among high risk, urban children, **maternal depression in early life is positively associated with wheezing phenotypes, and these associations are strongest for the medium wheeze-low atopy phenotype. Maternal stress and depression in early life is positively related with higher number of colds in early life.**

## RESULTS

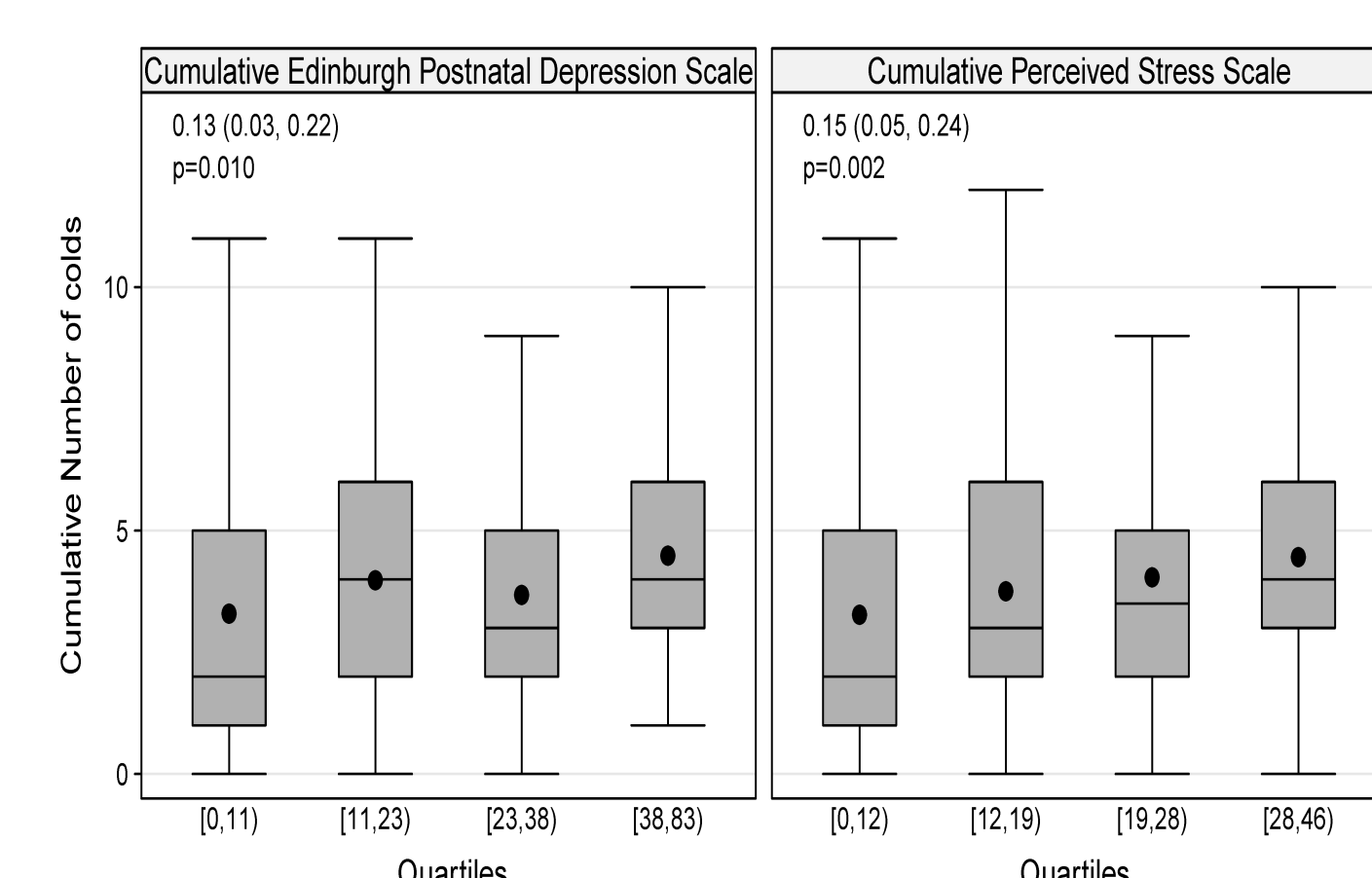
**Figure 1. Association of maternal stress and depression scores with respiratory phenotypes.**

Scores for maternal stress (A) and depression (C) obtained during the prenatal period and at intervals until year 3 were plotted for the 6 respiratory phenotypes.



OR were calculated for relationships between scores for stress (B) and depression (D) for the respiratory phenotypes. The LW-LA phenotypes was used as the reference group.

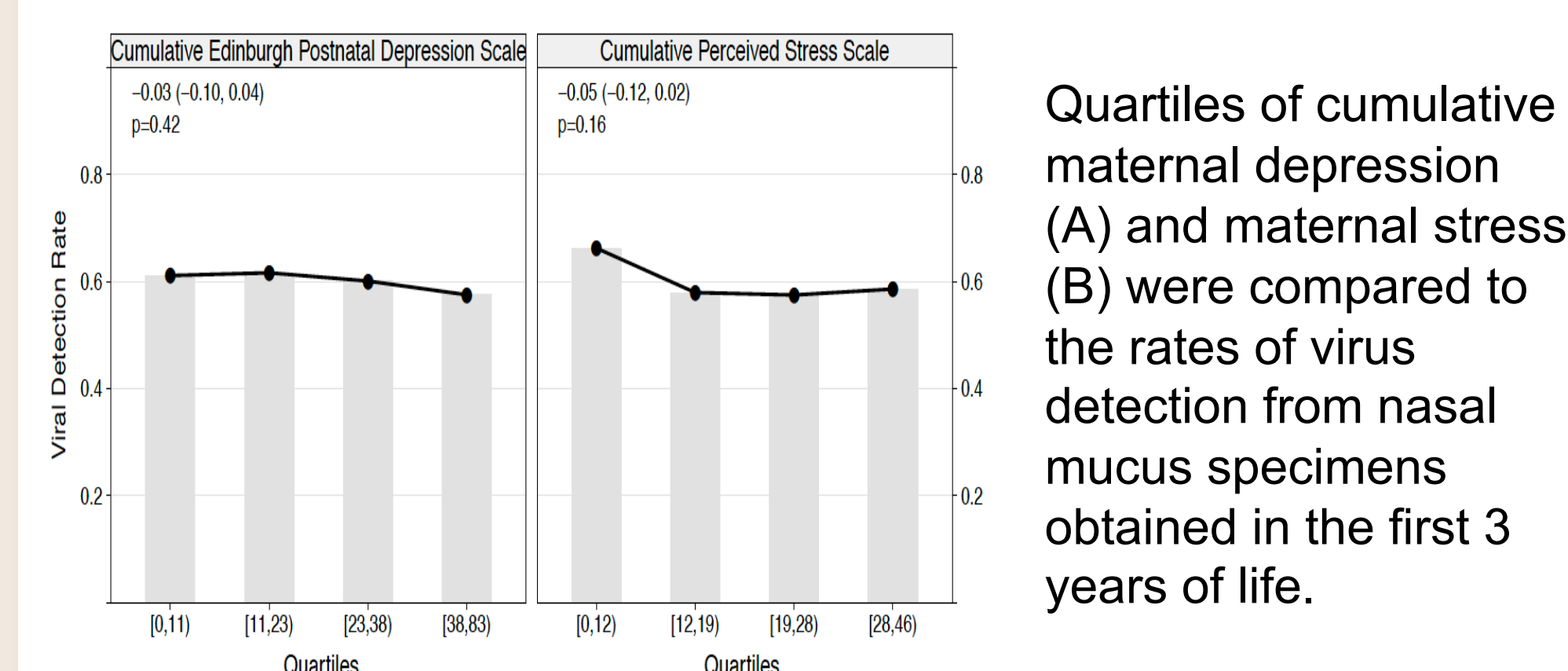
**Figure 2. Relationship of stress and depression quartiles to respiratory illnesses.**



Quartiles of cumulative scores (prenatal through year 3) for maternal depression (A) and stress (B) were compared to the total number of colds reported for the children during the first three years of life. The lines represent the means and box plots represent the medians and the 95% confidence interval, respectively.

## RESULTS CONTINUED

**Figure 3. Relationships between maternal stress and depression scores and diagnostic virology.**



Quartiles of cumulative maternal depression (A) and maternal stress (B) were compared to the rates of virus detection from nasal mucus specimens obtained in the first 3 years of life.

## ADDITIONAL KEY INFORMATION

**CONCLUSIONS:** Among high risk, urban children, higher levels of early life maternal stress and depression were associated with an increased number of respiratory illnesses and the MW-LA phenotype. These results suggest that maternal stress and depression could increase susceptibility to viral illnesses in early life, recurrent wheeze and some forms of childhood asthma.

## FUNDING SOURCES:

This project has been funded in whole or in part with Federal funds from the National Institute of Allergy and Infectious Diseases, National Institutes of Health, under Contract numbers 1UM1AI114271-01, UM2AI117870. Additional support was provided by the National Center for Research Resources, National Institutes of Health, under grant NCRR: UL1TR001079.