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## Maternal Exposure to Particulate Air Pollution and Risk of Congenital Heart Defects

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Maternal exposure to ambient air pollution has increasingly been linked to congenital heart defects (CHDs). The objective of this study was to evaluate whether high levels of maternal exposure to PM<sub>2.5</sub> and PM<sub>10</sub> are related to increased risk of CHDs in Wuhan, China. We used data from a large birth cohort that includes 105,988 live-born infants, stillbirths, and fetal deaths. The study included mothers living in the central districts of Wuhan during pregnancy over the two-year period from June 10, 2011 to June 9, 2013. For each study participant, we assigned 1-month and 1-week averages of PM<sub>2.5</sub> and PM<sub>10</sub> exposure measurements obtained from the nearest exposure monitor to the living residence of mothers during their early pregnancy period. Logistic regression analyses were conducted to calculate the adjusted odds ratios (aORs) and 95% confidence intervals (CI) for the association between exposure to these ambient air pollutants during early pregnancy and CHDs. We observed an increased risk of CHDs overall and for ventricular septal defect (VSD) in relation to increasing PM<sub>2.5</sub> exposure. Using 1 week averages, the strongest associations with VSD were observed for PM<sub>2.5</sub> exposure between the 7th and 10th weeks of pregnancy, with aORs ranging from 1.11 to 1.17 (95% CI: 1.02 -1.20, 1.03 -1.22, 1.05 -1.24, 1.08 -1.26 separately) per a 10 µg/m<sup>3</sup> change in PM<sub>2.5</sub> concentration, which suggesting that this period in particular may be an important exposure window for risk of VSD in relation to PM<sub>2.5</sub> exposure. Our study adds to the small body of knowledge regarding the association between in utero exposure to air pollution and CHDs, and provides a rationale for the need for stringent control of air pollution to reduce PM<sub>2.5</sub> concentration.