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Supplemental Material

Prenatal Exposure to PM$_{2.5}$ Oxidative Potential and Lung Function in Infants and Preschool- Age Children: A Prospective Study

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Figure S2. Test of linearity of the OP_v^{DTT}-lung function parameters at 6 weeks. Comparison of the adjusted linear model (red) and the adjusted model, modelling exposure as a natural spline with 5 degrees of freedom (blue dashed line), for exposure to OP_v^{DTT} and lung function at 6 weeks. P-value is from the likelihood-ratio test. Summary table available in the Excel supplemental file. The green lines represent the thresholds for 1st and 99th percentile of outcome and exposure.

Figure S3. Test of linearity of the OP_v^{AA}-lung function parameters at 6 weeks. Comparison of the adjusted linear model (red) and the adjusted model, modelling exposure as a natural spline with 5 degrees of freedom (blue dashed line), for exposure to OP_v^{AA} and lung function at 6 weeks. P-value is from the likelihood-ratio test. Summary table available in the Excel supplemental file. The green lines represent the thresholds for 1st and 99th percentile of outcome and exposure.

Figure S4. Test of linearity of the $PM_{2.5}$-lung function parameters at 3 years. Comparison of the adjusted linear model (red) and the adjusted model, modelling exposure as a natural spline with 5 degrees of freedom (blue dashed line), for exposure to $PM_{2.5}$ and lung function at 3 years. P-value is from the likelihood-ratio test. Summary table available in the Excel supplemental file. The green lines represent the thresholds for 1st and 99th percentile of outcome and exposure.

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Figure S6. Test of linearity of the OP_v^{AA}-lung function parameters at 3 years. Comparison of the adjusted linear model (red) and the adjusted model, modelling exposure as a natural spline with 5 degrees of freedom (blue dashed line), for exposure to OP_v^{AA} and lung function at 3 years. P-value is from the likelihood-ratio test. Summary table available in the Excel supplemental file. The green lines represent the thresholds for 1st and 99th percentile of outcome and exposure.

Figure S7. Spearman correlation coefficients between the exposures. $PM_{2.5}$, particulate matter with an aerodynamic diameter <2.5 μm; OP_v^{AA}, volume-normalised oxidative potential measured by the AA assay; OP_v^{DTT}, volume-normalised oxidative potential measured by the DTT assay.

Figure S8. Comparison of the distribution of personal measurements of OP_v^{AA} (left), OP_v^{DTT} (center) and $PM_{2.5}$ (right) during each week of sampling, and their average. See Table S3 for corresponding numeric data. Note: Boxes represent 25th to 75th percentiles, the middle horizontal line represents the median, whiskers extend to the most extreme point within 1.5 interquartile ranges of the box and the dots outside boxes indicate outliers. PM2.5, particulate matter with an aerodynamic diameter <2.5 μm; OPvAA, volume-normalised oxidative potential measured by the AA assay; OPvDTT, volume-normalised oxidative potential measured by the DTT assay.

Figure S9. Effect of each confounder separately on the regression models at 6 weeks, adjusted for sex, height and weight, and comparison to the main model, adjusted on all the confounders listed. Outcomes and exposures were scaled by their IQR. See Excel supplemental file for corresponding numeric data. Whiskers represent the 95% confidence interval around the estimate. $PM_{2.5}$, particulate matter with an aerodynamic diameter <2.5 μm ($\mu g\ m^{-3}$); OP_v^{DTT}, volume-normalised oxidative potential measured by the DTT assay ($nmol\ min^{-1}\ m^{-3}$); OP_v^{AA}, volume-normalised oxidative potential measured by the AA assay ($nmol\ min^{-1}\ m^{-3}$); FRC, functional residual capacity; LCI, lung clearance index; V_T, tidal volume; t_{PTEF}/t_E ratio of time to peak tidal expiratory flow to expiratory time.

Figure S10. Effect of each confounder separately on the regression models at 3 years, adjusted for sex, height and weight, and comparison to the main model, adjusted on all the confounders listed. Outcomes and exposures were scaled by their IQR. See Table S3 for corresponding numeric data. Whiskers represent the 95% confidence interval around the estimate. $PM_{2.5}$, particulate matter with an aerodynamic diameter <2.5 μm ($\mu g\ m^{-3}$); OP_v^{DTT}, volume-normalised oxidative potential measured by the DTT assay ($nmol\ min^{-1}\ m^{-3}$); OP_v^{AA}, volume-normalised oxidative potential measured by the AA assay ($nmol\ min^{-1}\ m^{-3}$); Rrs_7, resistance at a frequency of 7 Hz; Rrs_{7-19}, difference between the resistance at 7 Hz and at 19 Hz; Xrs_7, reactance at a frequency of 7 Hz; AX, area under the reactance curve.

Figure S11. Association between personal exposure to $PM_{2.5}$, OP_v^{DTT} and OP_v^{AA} during pregnancy and lung function parameters measured at 6 weeks in the multiple linear models and in the sensitivity analysis excluding leverage and influencing points, estimated by Cook's distance. Outcomes and exposures were scaled by their IQR. See Table S4 for corresponding numeric data. Whiskers represent the 95% confidence interval around the estimate. Models were adjusted on child's height, weight, sex, age, season of sampling, breastfeeding, environmental tobacco smoke, maternal age and BMI before pregnancy, parental level of education, parental history of rhinitis and mean temperature during pregnancy. $PM_{2.5}$, particulate matter with an aerodynamic diameter <2.5 μm ($\mu g\ m^{-3}$); OP_v^{DTT}, volume-normalised oxidative potential measured by the DTT assay ($nmol\ min^{-1}\ m^{-3}$); OP_v^{AA}, volume-normalised oxidative potential measured by the AA assay ($nmol\ min^{-1}\ m^{-3}$); FRC, functional residual capacity; LCI, lung clearance index; V_T, tidal volume; t_{PTEF}/t_E ratio of time to peak tidal expiratory flow to expiratory time.

Figure S12. Association between personal exposure to $PM_{2.5}$, OP_v^{DTT} and OP_v^{AA} during pregnancy and lung function parameters measured at 3 years in the multiple linear models and in the sensitivity analysis excluding leverage and influencing points, estimated by Cook's distance. Outcomes and exposures were scaled by their IQR. See Table S5 for corresponding numeric data. Whiskers represent the 95% confidence interval around the estimate. Model were adjusted on child's height, weight, sex, age, season of sampling, breastfeeding, environmental tobacco smoke, maternal age and BMI before pregnancy, parental level of education, parental history of rhinitis and mean temperature during pregnancy. $PM_{2.5}$, particulate matter with an aerodynamic diameter <2.5 µm ($\mu g\ m^{-3}$); OP_v^{DTT}, volume-normalised oxidative potential measured by the DTT assay ($nmol\ min^{-1}\ m^{-3}$); OP_v^{AA}, volume-normalised oxidative potential measured by the AA assay ($nmol\ min^{-1}\ m^{-3}$); Rrs_7, resistance at a frequency of 7 Hz; Rrs_{7-19}, difference between the resistance at 7 Hz and at 19 Hz; Xrs_7, reactance at a frequency of 7 Hz; AX, area under the reactance curve.

Additional File- Excel Document