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Title: The effect of short-term pre-exposure to ambient bioaerosols, anthropogenic pollutants and noise on cardiopulmonary health baseline parameters

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Body: Exposure to ambient air pollution is known to affect some health outcomes (such as asthma exacerbation and CVA); however, findings on short-term effects are inconsistent and have important implications for baseline measurements in experimental studies of acute health effects. The current study aimed to investigate the 3-day pre-exposure lag effect of ambient bioaerosols, anthropogenic pollutants and noise on cardiopulmonary baseline measurements in an experimental acute health effect study. Participants (N = 31; 58% female) had their residing addresses geo-coded for spatiotemporal modeling of NOX and PM2.5, and temporal modeling of bioaerosols and noise. Health baseline parameters (FEV1, PEF, eNO, blood pressure and pulse) were collected from each participant on four different occasions and analysed via multivariate-adjusted linear mixed modeling. FEV1 was associated with 2-day-lag NOX and PM2.5 ($p < 0.04$), and eNO with 3-day-lag NO2, NOX, PM2.5 ($p < 0.02$) levels. Further, FEV1 was associated with 1-day-lag Palmeres ($p < 0.03$), and with 3-day-lag Chenopodiaceae and Cupressaceae ($p < 0.04$) pollen levels. Furthermore, PEF was associated with 2-day-lag Artemisia and Chenopodiaceae ($p < 0.02$) levels. Systolic and diastolic blood pressure were associated with 3-day-lag PM2.5 ($p < 0.04$) and NOX ($p < 0.02$) levels. Further, associations were seen with pulse and 0-day-lag PM2.5 ($p < 0.04$), NO2 ($p < 0.02$) and noise ($p < 0.01$) levels. Pre-exposure to NOX, PM2.5, various bioaerosols and noise may compromise measurement of cardiopulmonary baseline parameters, especially in short-term experimental research of specific acute health effects.