

## Publication

### A review of ambient air pollution exposure assessment methods in determining childhood respiratory health effects in children under five

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Various epidemiological studies have reported on air pollution exposure-related lung function decline and respiratory health effects in children. Children have increased susceptibility to ambient air pollutants as physiological and structural changes of the lung are still occurring within the first five years of life after birth. This review examines applications in air pollution exposure assessment methods when evaluating lung function and respiratory health concentration-response effects in young children, while considering the effects of critical windows of exposure. We identified 13 studies that used various methods of exposure assessment in assessing respiratory health outcomes (presence of lower respiratory tract infections, respiratory symptoms, wheezing and asthma) in children under five. The methods applied included personal monitoring (n = 1), proximity-based methods (n = 3), inverse distance weighting (n = 2), geographic weighted regression (n = 1), dispersion modeling (n = 1), satellite-based methods (n = 2) and land use regression modeling (n = 5). These studies assessed exposure and outcomes at different "windows of susceptibility": antenatally/specific trimesters (n = 8), infancy (n = 5) and early childhood (n = 6). In most studies, the reported measures of air pollutants were noted to be below the prescribed limits, though for some, a cause-effect association was observed. It was also noted that there was very little variation in estimates between time points or trimesters of exposure, likely attributed to limitations in the selected exposure assessment method. Moderate to high correlations between trimesters were reported for most studies. © 2022 by the authors.

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