Associations between Air Pollution and Doctors' House Visits for Cardiorespiratory Diseases in Bordeaux, France: a Time-Series Analysis

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Our objective was to study the short-term relationships between daily levels of air pollutants (NO_2, PM10 and O_3) d the number of doctors' house visits for cardiorespiratory diseases for the years 2000-2006 in the area of Bordeaux, southwestern France.

Daily numbers of doctor's visits were obtained from SOS-Medecins Bordeaux, a healthcare network of general practitioners, for several cardiovascular and respiratory diseases. Excess relative risks (ERRs) of visit for each indicator associated with a 10 µm/m^3 increase in pollutant levels were estimated by fitting a Poisson regression model, controlling for well-known confounding factors and temporal trends. Penalised cubic regression spline functions were used to control for long term trends and seasonality. Temperature and influenza were modeled using natural splines with 3 degrees of freedom for each.

Positive and significant associations were observed between NO_2 and particles and respiratory diseases (ex for PM10: ERR of upper respiratory diseases=1.5% (95% CI=[0.3-2.7]), and ERR of lower respiratory diseases=2.5% (95% CI=[0.5-4.4]). These associations were higher for the elderly. Similar associations were found with cardiovascular diseases (ERR=2.7%, 95% CI=[0.4-5.0]). No association was found with asthma.

These results suggest that air pollution and especially fine particulate pollution, which has already been shown as associated with respiratory mortality and hospitalizations, could be associated with other respiratory diseases not severe enough to lead to hospitalization or death, but affecting a large part of the population. Bi-pollutant models and distributed lag models will be performed to better understand the effects of different air pollutants.