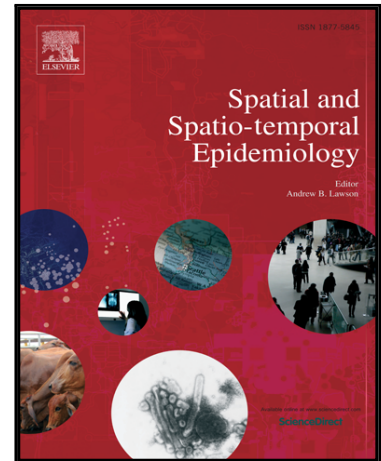


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Two-stage Bayesian model to evaluate the effect of air pollution on chronic respiratory diseases using drug prescriptions

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Abstract

Exposure to high levels of air pollutant concentration is known to be associated with respiratory problems which can translate into higher morbidity and mortality rates. The link between air pollution and population health has mainly been assessed considering air quality and hospitalization or mortality data. However this approach limits the analysis to individuals characterized by severe conditions. In this paper we evaluate the link between air pollution and respiratory diseases using general practice drug prescriptions for chronic respiratory diseases, which allow to draw conclusions based on the general population.

We propose a two-stage statistical approach: in the first stage we specify a space-time model to estimate the monthly NO₂ concentration integrating several data sources characterized by different spatio-temporal resolution; in the second stage we link the concentration to the β_2 -agonists prescribed monthly by general practices in England and we model the prescription rates through a small area approach.

Keywords: Bayesian model, INLA, COSP, General Practice

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