

OUTDOOR EXPOSURE TO FORMALDEHYDE (CH₂O) IS ASSOCIATED WITH AN INCREASED RISK OF HOSPITALIZATION FOR RESPIRATORY DISEASES IN CHILDREN

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Background and aims: Children living near wood industries have an increased risk of developing respiratory diseases.

We aimed at assessing if residential outdoor exposure to NO₂ and CH₂O was associated with the risk of hospitalization for respiratory diseases in children.

Methods: In 2006, all the children (3-14 years) living in the Viadana district (the largest wood manufacturing areas in Northern Italy) were surveyed through a parental questionnaire (n=3854) and their home addresses were geocoded. Their history of hospitalization for respiratory diseases (ICD-IX: 460-519) was assessed from January 2007 to December 2009, using discharge records obtained from the local Health Unit. To assess the outdoor exposure to NO₂ and CH₂O, 63 passive samplers were installed in the area using a Partitioning Around Medoids (PAM) algorithm. Pollutants were monitored twice, both in winter and in summer 2010. Kriging interpolation was used to attribute the average annual concentration of pollutants to each child. Poisson regression models were used to assess the association between the hospitalization rates (HR) and the average concentration of pollutants.

Results: By December 2010, 3798 (98.5%) children had been traced. During the 3 years of follow-up, 121 hospital admissions, caused by respiratory diseases, occurred (annual HR = 10.8/1000/year). The HR for respiratory diseases slightly increased with increasing outdoor exposure to NO₂ (µg/m³) (RR:1.02; 95%CI: 0.95-1.10), while they were strongly associated to CH₂O outdoor concentration (µg/m³) (RR:2.41; 95%CI: 1.07-5.43).

Conclusions: Emissions from wood industries apparently have a serious impact on children's health.