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Title: Association between daily levels of air pollution and school absences in the proximity of a cement plant in Italy

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Body: Background: Emission of dust represents the main hazard associated with cement production and may cause adverse respiratory health effects to the population living nearby. Aim: To evaluate the association between daily levels of PM₁₀ and a morbidity indicator (school absenteeism) in children aged 7-14 years attending a school within 2km from a cement plant in Fumane (Northern Italy). Methods: Data on absences of students (average: 461 students/year) and daily concentrations of PM₁₀ from a fixed monitoring station placed in the schoolyard were collected for 3 school years (541 school days from November 2007 to June 2010). The association between pollution in the same day (Lag 0) and in the previous 4 days (Lag 1 to 4) and school absenteeism was studied using generalized additive Poisson regression models, adjusting for short-term trend, day of the week, flu epidemics and daily temperature. Results: During the considered period, the daily average concentration of PM₁₀ was 34.8 µg/m³. An increase of 10 µg/m³ of PM₁₀ was associated with a significant increase of 2.2% in school absences (RR:1.022; 95%CI: 1.007-1.037) two days after (lag2). The association between average level of pollutants from Lag 0 to Lag 4 and school absences confirmed the presence of a statically significant association with PM₁₀ levels (RR:1.016; 95%CI:1.003-1.029 for each + µg/m³ of PM₁₀). Conclusions: Daily PM₁₀ levels are associated with school absences, a proxy indicator of short-term morbidity, in children who attend schools in proximity to a cement plant. Primary prevention interventions aimed at reducing air pollution in the area are recommended.