

LONG-TERM EXPOSURE TO AIR POLLUTANTS IN THREE POLISH AGGLOMERATIONS AND RISK OF HOSPITAL ADMISSIONS DUE TO COPD EXACERBATIONS.

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Objective: The main goal was to find the association between exposure to airborne pollutants and the risk of COPD exacerbations in three largest urban agglomerations in Poland: Warsaw, Cracow, and the Tricity.

Materials and methods: A case-crossover approach was used to analyse data from 2011-2018. Distributed lag nonlinear models were used to assess the risk of hospital admission due to COPD exacerbations during 21 days following exposure to PM, NO₂, and SO₂.

Results: In total 20,249 hospitalizations were identified. During 21 days after exposure, the rate ratio (95% CI) for admissions per 10 µg/m³ was 1.028 (1.007-1.048) for PM₁₀, 1.030 (1.005-1.054) for PM_{2.5}, 1.033 (0.989-1.079) for NO₂ and 1.146 (1.039-1.262) for SO₂. The highest admission risk for NO₂ and SO₂ was on the day of exposure but for PM it peaked 10 days after exposure. The proportions of hospitalizations attributable to air pollutants were: 8.79%, 7.60%, 10.2% and 7.73% for PM₁₀, PM_{2.5}, NO₂ and SO₂ respectively.

Conclusions: Exposure to PM, NO₂ and SO₂ was associated with an increased risk of hospitalization due to COPD exacerbations, but the risk patterns for particulate and gaseous pollutants were different. Improvement of air quality in Poland is crucial to reduce the burden of COPD.