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ABSTRACT E-BOOK

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Air pollution » Traffic-related

Association between outdoor traffic air pollutants and spread of SARS-CoV-2 pandemic in Modena, Northern Italy

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BACKGROUND AND AIM: Italy was the first European country severely affected by the SARS-CoV-2 pandemic, especially during the first wave in the North of the country. In particular, Modena is a city of Emilia-Romagna which is a region entirely included in the Po valley, one of European areas characterized by the heaviest air pollution levels due also to its orography. Previous studies yielded at a regional level suggested that higher air pollutant levels may increase both SARS-CoV-2 infection and mortality.

METHODS: In this study, we further investigated the association between air pollutant exposure and spread of the SARS-CoV-2 using data collected from Modena municipality in the period February 2020-April 2021. We used traffic pollutant levels collected from an urban air quality monitoring station in the period January 2020-January 2021, including particulate matter (PM₁₀), nitrogen oxides (NO₂ and NO_x), benzene, and black carbon (BC). We used a random-effects linear regression model within panel data analysis over the study period and we computed beta correlation coefficients (beta) with 95% confidence interval-CI between mean daily pollutant concentrations and SARS-CoV-2 daily positive cases diagnosed in Modena.

RESULTS: We found a positive correlation between all traffic pollutants and SARS-CoV-2 cases, namely for PM₁₀ beta was 1.23 (95%CI 1.00-1.46), lower for NO_x (beta=0.66, 95%CI 0.56-0.75), and higher for NO₂ (beta=1.95, 95%CI 1.59-2.31), benzene (beta=41.41, 95%CI 36.23-46.59), and BC (beta=5.95, 95%CI 1.19-10.72).

CONCLUSIONS: Notwithstanding the limitations of use of aggregated data and potential the residual confounding, these findings seem to support the hypothesis that high levels of air pollution may favor the spread of SARS-CoV-2 infection, or alternatively that they reflect a higher mobility and number of social contacts that favor the spread of the infection.

Keywords: Air pollution, Traffic-related, Infectious diseases, Environmental epidemiology, Exposure assessment