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Editorial

Outdoor Air Pollution and Human Health

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"Outdoor Air Pollution and Human Health" addresses one of the most critical areas of concern in society. Air pollution exposure is well known to cause several diseases and pose a greater risk to human health, and most significantly contributes to cardiopulmonary diseases, stroke, lung cancer, and communicable diseases, such as pneumonia. In addition, recent epidemiological studies have suggested that air pollution is also linked with diabetes, low birth weight, tuberculosis, mental health, and cognitive impacts, such as autism, Alzheimer's disease, and dementia. This Special Issue (SI) aims to better understand the levels and sources of air pollutants and key contributors to the health burden—critical for implementing effective air pollution control strategies.

The nine papers included in this Special Issue cover a wide range of the selected topics, encompassing the areas of particulate and gaseous air pollution, their source apportionment, exposure, mechanism, and epidemiological evidence. They are summarized below [1–9].

For the first time, periodontitis risk associated with long-term air pollution has been assessed in the Taiwan population by Lin, H.-J. and colleagues [1]. Outcomes of the study show that the residents in Taiwan with long-term exposure to higher levels of air pollutants had a greater risk of periodontitis.

Zani, C. et al. [2], assessed DNA damage with micronuclei and comet tests on buccal cells of 6–8-year-old children living in an area in Northern Italy with high air pollution. Their study revealed that the associations between air pollutant levels (CO, NO_2, SO_2, benzene, O_3, PM_{10}, and $PM_{2.5}$; $PM_{0.5}$, and PAHs) and DNA damage were not significant at different lag times, and they did not demonstrate an association with various air pollutants evaluated in an area with high levels of air pollution.

A Polish study, that assessed the acute respiratory responses to air pollution exposure during physical training in young adults with and without allergies, was presented by Kocot, K. et al. [3]. The study revealed that in young and healthy adults, sports training under exposure to high levels of ambient air pollutants leads to a small decrease in forced expiratory volume in 1 s (FEV1). The allergy might be a modifying factor in the respiratory responses to air pollution. Post-exercise decreases in FEV1/forced vital capacity quotient (FVC) was related to pre-exercise 3 h averages of PM_{10} and NO_2 in people with ever-diagnosed upper-respiratory allergy only.

"Three-Year Variations in Criteria Atmospheric Pollutants and Their Relationship with Rainwater Chemistry in Karst Urban Region, Southwest China" were examined by Zeng, J.; Ge, X.; Wu, Q.; and Zhang, S. [4] in the fourth paper of the Special Issue. The linkage between air pollutants and rainwater chemistry revealed that the rainfall process controlled the concentrations of rainwater ions and the related rainwater acidification/alkalization.

Chen, H.-L. et al. [5] reported a study on ambient air pollution exposure and risk of developmental delay in children and teenagers in Taiwan, and their findings suggest that air pollution exposure increases the risk of developmental delay in children and teenagers.

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A strong relationship between exposure to high ambient levels of $PM_{2.5}$ and self-reported cardiovascular disease (CVD) at enrollment was reported in another interesting study by Valdez, R.B. et al. [6], who assessed the association between CVD and long-term exposure to fine particulate matter ($PM_{2.5}$) in the southeastern United States population.

Wu, C.-C. and co-authors found a strong association of PAH exposure with bowel disorder risk among the adult population in the United States, especially in female and non-obesity populations [7].

Saccharides emissions from biomass and coal burning in northwest China and their application in source contribution estimation were reported by He, K. and coworkers [8]. The results indicated that existing methods often overestimate saccharides emissions from biomass burning, and the contribution from non-biomass-burning sources should not be ignored.

This Special Issue also contributed a review of the effects of $PM_{2.5}$ on chronic airway diseases by Li, X. and Liu, X. [9]. The review asserts that the most challenging but most effective way to prevent the onset and progression of respiratory diseases is the reduction of air pollution.

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