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HEALTH IMPACT ASSESSMENT OF PM_{2.5} IN THE SAIPA AUTOMOTIVE INDUSTRY USING AIRQ+

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Abstract

One of the biggest environmental issues today is air pollution, which is caused by a variety of businesses, particularly those that produce particulate matter. This study aims to assess how particulate matter emitted by the automotive industry affects human health. After measuring the concentrations from the stack on a monthly basis throughout 2018-2020, the distribution of PM_{2.5} surrounding Saipa was modeled using AERMOD (v. 8.9), the population of the specified area was calculated with Zonal Statistics in Arc MAP (v. 10.3), and health risk assessment was performed with the AirQ+ (v. 2) model. The maximum PM_{2.5} values for the annual periods were determined to be 429.84 $\mu\text{g}/\text{m}^3$. The results of the quantitative risk assessment indicate that with a 10 $\mu\text{g}/\text{m}^3$ increase in particulate matter, there was a 6.2% rise in the relative mortality risk. Long-term exposure to fine particles raises the risk of mortality. Consistent air quality management and sustainable city planning are urgently needed to mitigate the adverse effects of PM_{2.5} exposures in the paint shop.

Key words: air pollution, health risk assessment, particulate matter, Tehran, urban environment

Received: December, 2022; *Revised final:* July, 2023; *Accepted:* January, 2024; *Published in final edited form:* February, 2024

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