

Abstract

**HEALTH IMPACTS AND PREVENTION STRATEGIES OF URBAN AIR
POLLUTION**

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Abstract

Urban air pollution represents one of the most significant environmental health risks worldwide, particularly in rapidly developing urban areas. Epidemiological studies consistently link major air pollutants—including particulate matter (PM_{2.5} and PM₁₀), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂)—with a range of adverse health outcomes. This study analyzes the health impacts of urban air pollution, with a focus on respiratory and cardiovascular diseases, and evaluates current prevention and control strategies. The review synthesizes findings from 11 key peer-reviewed studies, including epidemiological analyses, systematic reviews, and policy evaluations, published between 1993 and 2024. The findings indicate that long-term exposure to PM_{2.5} is associated with a significant increase in the risk of chronic respiratory conditions, cardiovascular diseases, and premature mortality. Landmark cohort studies demonstrate a 6–15% increase in cardiovascular mortality per 10 µg/m³ rise in PM_{2.5} exposures. Vulnerable populations, including children and the elderly, are particularly susceptible to these effects. In addition, the synthesis of available evidence highlights that integrated prevention strategies—combining policy measures (e.g., emission standards), urban planning solutions (e.g., green infrastructure, traffic management), and technological innovations (e.g., clean energy, emission control systems)—have proven effective in reducing ambient pollutant levels and associated health burdens.

Keywords: urban air pollution, PM_{2.5}, health impacts, respiratory diseases, prevention strategies

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