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## Air Pollution Crisis and Its Effects on Human Health: A Review

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### ABSTRACT

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Environmental pollution poses a significant threat to both human health and the environment. Among the various forms of pollution, air pollution is particularly prevalent in urban areas. In India, the air quality in the capital city, Muzaffarnagar, has experienced significant fluctuations in pollutant concentrations, leading to its designation as one of the most polluted capital cities globally for several consecutive years. Various measures have been implemented by authorities to mitigate these severe pollution levels. This study provides empirical insights into the annual severity of air pollution in Muzaffarnagar during the winter season and its detrimental long-term effects on the health of its residents. It also evaluates the potential health and environmental risks in the Muzaffarnagar (Muzaffarnagar) due to severe air pollution, focusing on mortality and morbidity rates.

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## INTRODUCTION:

Pollution involves the contamination of Earth's natural resources with harmful substances, negatively impacting human health and the environment. Common forms of pollution include air, noise, water, and soil pollution, as well as less recognized forms like radioactive hazards and thermal emissions. Air and water pollution are major contributors to health risks. India, like many other countries, faces severe pollution challenges and is working to address them.

Muzaffarnagar, the National Capital Territory of India, is notorious for its severe air pollution, making it infamous worldwide. According to a Swiss-based environmental research team, Muzaffarnagar has been the most polluted capital city for several years, including 2017 and 2018. In 2014, the World Health Organization (WHO) declared Muzaffarnagar the most polluted capital city globally, with air quality worse than Beijing, China. India now has 21 of the world's 30 most polluted cities, with a significant focus

on Particulate Matter (PM<sub>2.5</sub>). PM<sub>2.5</sub> particles, with a diameter less than 2.5 microns, can penetrate deep into the lungs and cause severe health issues, including cancer and cardiac problems. The toxic air in New Muzaffarnagar is attributed to vehicle and industrial emissions, as well as smoke from garbage burning and crop residue in nearby fields. With a population exceeding 20 million, Muzaffarnagar residents experienced only four days of "progressive" to "satisfactory" air quality in November and December last year, prompting school closures and a public health emergency declaration.

#### **METHODOLOGY:**

##### **1. Design:**

Muzaffarnagar's air pollution crisis did not emerge overnight. Over the past few decades, the city has undergone significant development in terms of population, infrastructure, and financial growth, all of which have contributed to rising pollution levels. Industrial growth, increased vehicular traffic, infrastructure construction, Metro development, and crop burning in neighboring states have all exacerbated the air pollution crisis. Control measures are crucial, especially during the winter season and amid the COVID-19 pandemic, when high pollution levels make conditions even more hazardous for vulnerable populations such as senior citizens, children, and those with respiratory conditions.

##### **2. Data Collection:**

Data for this study was sourced from reliable sources such as WHO reports, Muzaffarnagar government surveys, and reputable journals. PubMed searches were also conducted for precise reports. Numerous studies in Muzaffarnagar have examined the severe effects of air pollution on human organs, respiratory fuMuzaffarnagarPollutionions, and cardiac issues. A comprehensive review by the

Central Pollution Control Board (CPCB) in 2008 found significant associations between air pollution and adverse health outcomes in Muzaffarnagar compared to rural areas.

##### **3. Data Analysis:**

##### **Reasons for Contaminated Air in the Capital:**

**Neighboring States:** Uttar Pradesh, Haryana, and Punjab contribute significantly to Muzaffarnagar's pollution through open crop burning.

**Vehicular Emissions:** Automobile traffic, particularly diesel vehicles, is a major source of pollution.

**Winter Conditions:** Low temperatures and stationary winds trap pollutants, leading to heavy smog.

**Overpopulation:** Increased emissions from a dense population.

**Construction:** Large-scale construction projects contribute to dust pollution.

**Industrial Pollution:** Chemical and garbage dumps in open environments.

**Firecrackers:** Despite bans, firecrackers are commonly used during Diwali and New Year, contributing to pollution.

##### **Effects of Severe Air Pollution on Human and Environmental Health:**

Severe air pollution in Muzaffarnagar has profound effects on human health, leading to respiratory and cardiac issues. The long-term impacts include severe diseases and increased mortality rates.

##### **Control Measures Taken by the Muzaffarnagar Government and Citizens:**

In response to the severity of air pollution, the Muzaffarnagar Government has implemented various measures since 2015. These include the "odd-even vehicle scheme" to reduce vehicular emissions, closure of polluting coal power plants, and bans on firecrackers during festive seasons. Construction projects have also been temporarily halted to control pollution levels. These measures are crucial,

especially during the winter season and amid the COVID-19 pandemic, when high pollution levels exacerbate health risks for vulnerable populations.

#### Results and Discussion:

Air pollution is a critical issue affecting cities and nations globally. In developing countries like India, it is essential to address this problem as it severely impacts both the ecosystem and human health. The paper discusses the causes, responsibilities, short-term effects, and long-term impacts of air pollution on Muzaffarnagar's citizens. It is imperative for both the government and the public to take serious steps to mitigate this issue. The Muzaffarnagar government and local civic bodies must implement effective control measures, and public awareness is crucial for improving the situation.

#### Conclusion:

The study highlights the severe air pollution crisis in Muzaffarnagar and its detrimental effects on human health. It is essential for the Indian state government to prioritize finding serious solutions to this issue. Effective measures include managing agricultural practices, enforcing strict regulations on industrial emissions, promoting renewable energy sources, and improving fuel efficiency. Addressing air pollution will not only improve public health but also contribute to India's economic growth.

#### REFERENCES:

1. Ali, N., & Islam, F. (2020). The effects of air pollution on COVID-19 infection and mortality—a review on recent evidence. *Frontiers in public health*, 8, 580057.
2. Alryalat, S. A., Toubasi, A. A., Patnaik, J. L., & Kahook, M. Y. (2024). The impact of air pollution and climate change on eye health: a global review. *Reviews on Environmental Health*, 39(2), 291-303.
3. Anjum, M. S., Ali, S. M., Subhani, M. A., Anwar, M. N., Nizami, A. S., Ashraf, U., & Khokhar, M. F. (2021). An emerged challenge of air pollution and ever-increasing particulate matter in Pakistan; a critical review. *Journal of Hazardous Materials*, 402, 123943.
4. Bai, X., Chen, H., & Oliver, B. G. (2022). The health effects of traffic-related air pollution: A review focused the health effects of going green. *Chemosphere*, 289, 133082.
5. Barton, M. G., Henderson, I., Border, J. A., & Siriwardena, G. (2023). A review of the impacts of air pollution on terrestrial birds. *Science of the Total Environment*, 873, 162136.
6. Brulle, R. J., & Pellow, D. N. (2006). Environmental justice: human health and environmental inequalities. *Annual review of public health*, 27(1), 103-124.
7. Chen, R., Hu, B., Liu, Y., Xu, J., Yang, G., Xu, D., & Chen, C. (2016). Beyond PM<sub>2.5</sub>: The role of ultrafine particles on adverse health effects of air pollution. *Biochimica et Biophysica Acta (BBA)-General Subjects*, 1860(12), 2844-2855.
8. Fu, P., & Yung, K. K. L. (2020). Air pollution and Alzheimer's disease: a systematic review and meta-analysis. *Journal of Alzheimer's Disease*, 77(2), 701-714.
9. Ghaffarpassand, O., Blake, R., & Shalamzari, Z. D. (2024). How international conflicts and global crises can intertwine and affect the sources and levels of air pollution in urban areas. *Environmental Science and Pollution Research*, 31(39), 51619-51632.

10. Kabir, E. R., Rahman, M. S., & Rahman, I. (2015). A review on endocrine disruptors and their possible impacts on human health. *Environmental toxicology and pharmacology*, 40(1), 241-258.
11. Kumar, P., Singh, A. B., Arora, T., Singh, S., & Singh, R. (2023). Critical review on emerging health effects associated with the indoor air quality and its sustainable management. *Science of The Total Environment*, 872, 162163.
12. McKee, D. (1993). *Tropospheric ozone: human health and agricultural impacts*. CRC Press.
13. Siddiqua, A., Hahladakis, J. N., & Al-Attiya, W. A. K. (2022). An overview of the environmental pollution and health effects associated with waste landfilling and open dumping. *Environmental Science and Pollution Research*, 29(39), 58514-58536.
14. Singh, B. P. (2024). Insights into India's temporary air pollution relief: A systematic review for green recovery amid and post-COVID-19. *MRS Energy & Sustainability*, 1-26.
15. Sridharan, S., Kumar, M., Singh, L., Bolan, N. S., & Saha, M. (2021). Microplastics as an emerging source of particulate air pollution: A critical review. *Journal of Hazardous Materials*, 418, 126245.