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AIR POLLUTION AND ITS IMPACT ON HUMAN HEALTH

Dr. Poonam Prabha Semwal
Associate Professor, Department of Zoology ,
D.B.S. (P.G.) College, Dehradun, India.

ABSTRACT:

Air pollution is considered as the major environmental risk Asthma, lung cancer, ventricular hypertrophy, Alzheimer's and Parkinson's diseases, psychological complications, autism, retinopathy, fetal growth, and low birth weight are all thought to be primarily influenced by air pollution in the environment. Air pollution is a recognizable natural wellbeing peril. When a smokestack rises, exhaust billows across a busy highway, or brown haze covers a city, we know what we're looking at. Some air pollution isn't seen, yet its impactful smell alarms you. It poses a significant threat to global prosperity and health. Air pollution , in all structures, is liable for more than 6.5 million passings every year worldwide, a number that has expanded throughout recent many years. In India, air pollution poses a significant threat to human health, which is now widely acknowledged. A body of evidence that suggests air pollution has a negative impact on the day-to-day functioning of people without diagnosable health problems is less well-known. These effects include impaired decision-making and reduced capabilities in a wide range of tasks. Aguilar-Gomez and others describe this study's investigation into how people respond to ambient pollution and the "non-health" effects of pollution in various industries.

KEYWORDS: *Air pollution , smokestack rises, exhaust billows across , Aguilar-Gomez.*

INTORDUCTION:

The World Health Organization noted that "[t]he burden of disease resulting from air pollution also imposes a significant economic burden" in its 2021 revision of global air quality guidelines. This is certainly the case in India, which is home to 39 of the world's 50 most polluted cities in terms of PM2.5 particulate pollution and is responsible for an estimated 18% of all deaths. However, a growing body of research demonstrates that exposure to air pollution can also significantly affect cognitive and physical performance. Albeit these unfriendly impacts are not diagnosable as illnesses, they can affect monetary result and prosperity that might cause More than seven million people worldwide die from diseases linked to PM2.5 pollution, according to a World Health Organization report. India, being a quickly emerging nation with expanding populace is experiencing serious air pollution ; as among the world's 10 most contaminated urban areas, nine of them lie in India The rising air pollution in the vast majority of the Indian megacities over most recent couple of many years and its significant human wellbeing influences definitely stand out lately.

Air Pollution Affects Our Health

In Europe, air pollution is the single greatest threat to human health from the environment and a major cause of disease and premature death. The European Environment Agency's most recent

estimates indicate that fine particulate matter continues to have the greatest impact on health. The majority of Europeans live in urban areas where air pollution can reach dangerous levels. A variety of illnesses, including stroke, chronic obstructive pulmonary disease, tracheal, bronchus, and lung cancers, aggravated asthma, and lower respiratory infections, can result from both short-term and long-term exposure to air pollution. Exposure to air pollution has been linked, according to the World Health Organization, to type 2 diabetes, obesity, systemic inflammation, Alzheimer's disease, and dementia. Air pollution, specifically PM2.5, has been identified as a major contributor to cancer by the International Agency for Research on Cancer. Every organ in the body can be affected by chronic exposure, which can make existing health conditions worse or worsen them, according to a recent global review. Kids and young people are especially powerless on the grounds that their bodies, organs and insusceptible frameworks are as yet creating. Children are unable to do much to protect themselves or influence air quality policies, despite the fact that air pollution has a negative impact on health during childhood and raises the risk of disease in later life.

Effects Of Air Pollution On Human Health

Climate change and air pollution are major current threats to rapidly expanding cities. In terms of climate action and sustainable development, developing nations like India, which is transitioning from predominantly rural to increasingly urban, must confront significant obstacles. By 2050, India is expected to have 416 million urban dwellers, or 53% of the country's population. The ongoing urbanization of the country has a negative impact on the climate of the region by altering the surface and boundary layer atmospheric properties of urban areas. Additionally, urbanization by altering land use and land cover has an impact on the climate through increased anthropogenic emissions, extreme precipitation, higher temperatures, and frequent heat waves with heat-related health effects. The regional climate changes are reflected in various meteorological conditions like temperature and precipitation changes. These local climate changes are triggered by anthropogenic emissions like greenhouse gas (GHG) emissions. Pollutant emissions and aerosol load in the atmosphere both rise as a result of the growing urban population and vehicular traffic, in addition to the impact of urbanization on the climate. The rising urbanization alongwith developing populace and industrialization has been expressed as one of the vital explanations behind high spray stacking in the Indian sub-mainland. As a result, this study reveals that the interconnectedness of climate change and air pollution is one of the greatest threats to human health and well-being in cities.

Air Pollution, Climate Change, and Human Health in Indian Cities: A Brief Review

Environmental change and air pollution have involved serious concern all around the world over the most recent couple of many years. The current audit has been completed in this worry over the Indian urban areas with huge effects of both the environmental change and air pollution on human wellbeing. Human health is at risk from the expanding urban areas that experience extreme climate events like high rainfall, extreme temperature, floods, and droughts. Urban residents are experiencing thermal discomfort and a number of health issues as a result of the elevated temperature levels brought on by the intensified heat waves brought on by climate change. The study also looks at the rising levels of air pollution that are higher than what is required for the majority of Indian megacities. The concentrations of PM and aerosols have been investigated, and the potentially harmful effects on human health of particles that enter the respiratory system and are inhaled by humans have also been discussed. Also looked at were the health effects of the COVID-2019 lockdown on Indian cities' air quality. Lastly, the connection between urbanization, air pollution, and climate change has been shown because air pollutants affect Earth's climate both directly and indirectly. As a result, the information in this review will act as a starting point for policymakers when it comes to evaluating vulnerable regions and putting into action plans to reduce air pollution. Based on the review, adaptation and mitigation measures can be implemented in Indian cities to mitigate the effects on human health by regularly monitoring air pollution and addressing climate change.

The long- and short-term effects of air pollution

Workers in a variety of industries, including garment production, agriculture, food processing, call centers, and the court system, appear to be less productive when exposed to more air pollution on a given day. These short-term effects on on-site workers' productivity cannot be explained by the onset of acute symptoms that cause employees to miss work or new or existing medical conditions brought on by prolonged exposure. Rather, they can be perceived as 'non-wellbeing' efficiency consequences for the labor force, separate from the impacts of ailments that could result from long-run openness. Air pollution appears to reduce labor supply in addition to its effects on on-site workers, partly through health-related mechanisms and partly through costly migration to less polluted areas. Air pollution seems to have short-term effects on productivity that go beyond the industries or locations that have been individually studied so far; gauges directed at the provincial level or with broadly far reaching firm information additionally find significant effects on generally speaking result which consolidate efficiency and work supply impacts. Even in places where air pollution is significantly less severe than it currently is in India, productivity decreases are observed. This suggests that these productivity declines may also be affecting a significant portion of the Indian workforce at any given time.

Why is worker productivity affected by air pollution in so many different industries? Workers in manufacturing and agriculture may be affected by air pollution's detrimental effects on the circulatory system and lungs, but white-collar workers may be affected by air pollution's effects on cognition and decision-making. Numerous studies demonstrate that scores on a variety of academic and cognitive tests fall as a result of air pollution. According to Huang et al., investors' behavioral biases may be exacerbated by air pollution, which may be the result of these subtle cognitive difficulties. While the hypothesised effect of air pollution on impulse control may explain why higher levels of pollution appear to raise rates of certain types of crime, Herrnstadt's effects on air pollution are caused by short-term changes in air quality. However, prolonged exposure to air pollution can also have a negative long-term impact on a person's capabilities, particularly if it occurs during pregnancy or early life. These effects include having a negative impact on children's academic performance, college attendance, employment, and earnings as adults. Long-term effects of pollution exposure are detectable even at lower exposure levels found in the United States, suggesting that even many Indians whose exposure was not high enough to cause diagnosable stunting may still have suffered small but meaningful long-term reductions in their capabilities. However, existing studies have found that air pollution's detrimental impact on child health contributes, for example, to the significant problem of child stunting in India.

Delineating the true impact of air pollution

An important part of studying the health and non-health effects of air pollution is distinguishing between correlation and causation. The possibility that individuals who are exposed to higher levels of pollution also have other underlying factors that affect their productivity but are difficult to observe must be confronted by researchers. For instance, people who live in areas with higher pollution levels may have fewer opportunities for employment. The use of quasi-experimental research designs in many of the aforementioned studies aims to exploit variation in pollution that is uncorrelated with these unobserved factors, such as changes in wind patterns, randomly occurring wildfires, changes in environmental policy, or factory closures that emit pollution. However, even if the impacts of pollution are accurately estimated, they must be interpreted with care. Avoidance is one example of a behavior that may reduce the overall effect on outcomes. These actions may lessen the direct effects of pollution, but they also have real costs in terms of time, money, or utility that are not captured by typical estimates.

Human Health Impacts by Air Pollution

The majority of Indian cities have seen a significant decline in air quality over the past few decades as a result of serious air pollution issues, such as Kolkata and Delhi, whose air quality exceeds CPCB and WHO standards. The everyday and yearly typical qualities were high for the majority of the

vaporous toxins in Indian urban communities . The study of the temporal variability and source contributions of PM1, trace metals, five major elements, and four water-soluble inorganic species in the Indo-Gangetic Plains found that the high level of ambient air pollution was one of the major factors in the burden of air pollution-related diseases in India. PM1 mass concentration is approximately 26% influenced by total WSIS. Secondary aerosols made up about 60% of the PM1 load and came mostly from stationary combustion sources. Further, environmental haze common during wintertime can seriously affect barometrical science in the air-shed of IGP. Air pollution-related health issues are a major concern, especially for developing Indian cities. After high blood pressure, indoor air pollution, poor nutrition, and smoking, outdoor air pollution has become the fifth leading cause of death in India in 2012, resulting in approximately 0.62 million premature deaths.

There is a link between short-, medium-, and long-term health effects from air pollution. The short-term health effects of breathing polluted air have been the subject of numerous studies. Transient effects incorporate aggravation to eyes, throat, and nose, and a few respiratory pollution s like pneumonia and bronchitis, while long haul air pollution influences include ongoing respiratory infections, heart related issues, cellular breakdown in the lungs, and even harm to the mind, liver, kidneys, or nerves detailed that both short-and long haul openness to air poisons added to worse hypertension and expanded hazard of occurrence hypertension. There has also been discussion of the connections between gaseous pollutants and health outcomes. Higher concentrations of gaseous and particulate matter in the air are significantly associated with premature mortality and hospitalizations for respiratory and post-respiratory illnesses in cities. The mass deposition fraction of coarse particles was higher in the extrathoracic region, whereas the mass deposition fraction of fine particles was significantly higher in the pulmonary region. Strengthening of biomass and biofuel consuming discharges during post-storm and wintertime have suggestions to more profound entrance and higher mass affidavit part of fine-particles in the PUL locale.

Health effects of air pollution

Air pollution is perceived as a significant danger to human wellbeing. Globally, the UN Environment Program has estimated that 1.1 billion people inhale polluted air. Gaseous co-pollutants, seasonal patterns, or weather did not alter the association between particulate pollution and cardiopulmonary mortality, as demonstrated by epidemiological studies, which have shown that ambient air particle concentrations are associated with a wide range of effects on human health, particularly on the cardiorespiratory system. In a similar vein, race, sex, and socioeconomic status had no significant impact on it. As a result, the association between particulate air pollution exposures and cardio-pulmonary mortality appeared to be causal. Particle pollution, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead are the six major air pollutants that the World Health Organization discusses. Groundwater, soil, and the air are all vulnerable to the negative effects of air pollution. Furthermore, it poses a significant threat to living things. As a result, we are particularly interested in these pollutants because of their connection to more extensive and serious issues affecting human health and the environment. Air pollution is greatly influenced by acid rain, climate change, the greenhouse effect, and other environmental factors.

Urbanization And Air Pollution In India

In Asian cities, air pollution levels and trends are closely linked to economic and social development. In addition, the meteorological conditions and rapidly increasing industrialization, urbanization, population growth, and demand for transportation influence air pollution in many Indian cities. In ongoing time, India is encountering a fast development and financial improvement reflected by industrialization, urbanization, ascend in pay and engine vehicle use. About two-thirds of Indians currently live in rural areas. In any case, the example is changing quickly as additional individuals are moving to the urban communities looking for work. The present investigation reveals that the majority of Indian megacities experience high levels of air pollution, with pollutant concentrations that are above the acceptable threshold. The necessity of continuous monitoring of air pollutants over the Indian

subcontinent using measurements and remote sensing satellite data is highlighted by the continuous emissions from both anthropogenic and natural sources that result in high PM concentrations and adverse effects on human health. By analyzing vulnerable areas, this review's essential information on air pollutant levels in various Indian megacities can assist in the development of efficient mitigation strategies for each city. The data can make it easier to create a baseline for air quality modeling studies that can accurately predict levels of air pollution for plans that effectively prepare for, adapt to, and mitigate air pollution. To effectively control the concentration of air pollutants across the nation, it is important to emphasize the high mortality and disease burden caused by air pollution in Indian cities. In addition, the findings that showed a decrease in air pollution during the COVID-19 lockdown period suggest that such brief restrictions on pollution mitigation be implemented in various Indian cities to improve air quality and, as a result, human health.

Air pollution

Air pollution is a significant and squeezing general wellbeing danger. The World Health Organization estimates that exposure to polluted air's fine particles, which can cause stroke, heart disease, lung cancer, chronic obstructive pulmonary disease, and respiratory infections like pneumonia, accounts for approximately 7 million annual deaths. Toxins incorporate particulate matter, carbon monoxide, ozone, nitrogen dioxide and sulfur dioxide. Air pollution in the household and the ambient (outdoor) environment is harmful to health. Air pollution is mostly caused by industries, transportation, coal-fired power plants, and household solid fuel use. Increasing at a disturbing rate, air pollution influences economies and individuals' personal satisfaction. It excessively influences ladies, infant and small kids. Key sources of ambient air pollution can be effectively reduced through investments and policies that support cleaner transportation, energy-efficient housing, power generation, industry, and improved municipal waste management. WHO exercises address the earnest general wellbeing need to answer impacts related with air pollution . Monitoring and strengthening the health sector with knowledge and tools to improve air quality, as well as informing policymakers and the general public about permissible exposure levels and the health effects of poor air quality, are important interventions.

In 2016, surrounding (outside) air pollution represented an expected 1 795 181 passings in the country because of stroke, coronary illness, cellular breakdown in the lungs and constant respiratory sicknesses. Tobacco smoke and solid fuel smoke from inefficient and leaky cooking stoves are the primary sources of air pollution in residential settings. India became the first nation in the world to develop country-specific targets and indicators in accordance with the global framework in 2013, following the endorsement of the Global Action Plan and Monitoring Framework for NCD prevention and control. These targets and indicators contribute to reducing the burden of indoor air pollution. In addition, a National Multisectoral Action Plan has been created to make it easier to achieve the national indicators and targets.

Air Pollution Environmental Problem

Due to its associated health risks for city residents, air pollution is a serious issue in megacities, where levels frequently exceed permissible limits. Air pollution causes unhealthy and unsanitary conditions in India's metropolitan areas. Over the past few decades, an emerging environmental problem in India's megacities has been the steady and alarming rise in urban air pollution. Primary or secondary air pollutants can be major indoor and outdoor air pollutants in urban areas. Particulate matter is one of the primary air pollutants that are directly emitted. Developing nations like India, which are undergoing ongoing urbanization, are experiencing an increase in air pollution issues as a result of a lack of services like adequate transportation management, suitable roads, and the unplanned distribution of industries. Cities' congested roads slow down average vehicle speeds, which raises vehicle emissions and raises air pollution levels. Unplanned urbanization, industrialization, and population growth all put human health at risk by raising air pollution levels, which can cause a variety of health problems. In addition, the problem is being exacerbated by the rise in pollutant emissions

caused by the extensive and intricate human activities that take place in these urban areas. The air pollutants in Indian cities come from either natural sources like the long-distance transport of desert dust influx from the western arid regions of Africa, the Middle East, and the Thar, mostly in the summer and before the monsoon.

CONCLUSION

Understanding how individuals in India answer surrounding pollution , and how they might benefit from outside input to answer fittingly, addresses a significant region for additional exploration close by endeavors to lay out which method for lessening pollution emanations would be viable in India. Workers in Mumbai's skyscrapers may be able to filter their air, but agricultural workers near burning stubble or workers in India's numerous small informal businesses may have more trouble protecting themselves and bearing the costs of adaptation. Air pollution may have very unequal effects on productivity due to the likely difference in the ability to avoid it, which could make existing income inequality even worse. More examination is as yet expected to all the more likely comprehend the non-wellbeing impacts of air pollution . There is yet no settlement on the specific idea of its mental impacts, or on the commonness and expenses of evasion and enhancement ways of behaving specifically settings Yet a developing collection of proof proposes that while numerous Indians experience the ill effects of sicknesses brought about via air pollution , still more prominent numbers might be adversely impacted via air pollution regardless of whether they never notice its effects in a substantial manner.

REFERENCES

- Adams, M. D. (2020). Air pollution in Ontario, Canada during the COVID-19 state of emergency.
- Agarwal, A. K., Singh, A. P., Gupta, T., Agarwal, R. A., Sharma, N., Rajput, P., et al. (2018). Mutagenicity and cytotoxicity of particulate matter .
  garwal, M., and Tandon, A. (2010). Modeling of the urban heat island in the form of mesoscale wind and of its effect on air pollution dispersal.
- Agarwal, R., Jayaraman, G., Anand, S., and Marimuthu, P. (2006). Assessing respiratory morbidity through pollution status and meteorological conditions for Delhi. Environ.
- Ahern, M., Kovats, R. S., Wilkinson, P., Few, R., and Matthies, F. (2005). Global health impacts of floods: epidemiologic evidence. Epidemiol.
- Ahmad, M., Tariq, S., Alam, K., Anwar, S., and Ikram, M. (2020). Long-term variation in aerosol optical properties and their climatic implications over major cities of Pakistan. J
- Akhtar, R. (2007). Climate change and health and heat wave mortality in India.
- Ali, H., Mishra, V., and Pai, D. S. (2014). Observed and projected urban extreme rainfall events in India.