International Research Journal of Research in Environmental Science and Toxicology Vol. 12(6) pp. 1-2, December, 2023
Available online https://www.interesjournals.org/research-environmental-science-toxicology/archive.html

Perspective

Causes and Consequences of Air Pollution

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Received: 27-September-2023,Manuscript No. JREST-23-118583; **Editor assigned:** 01-October- 2023, Pre QC No. JREST-23-118583 (PQ); **Reviewed:** 14-October- 2023, QC No. JREST-23-118583; **Revised:** 01-December-2023, Manuscript No. JREST-23-118583 (R); **Published:** 28-December-2023, DOI: 10.14303/2315-5698.2023.64

INTRODUCTION

The contamination of air due to the presence of compounds in the atmosphere that are harmful to the health of humans and other living beings or cause damage to the climate or materials, is referred to as air pollution. The contamination of indoor or outdoor environments by chemical, physical or biological agents also affects the natural properties of the atmosphere. Air contaminants include gases (such as ammonia, carbon monoxide, sulphur dioxide, nitrous oxides, methane and chlorofluorocarbons), particles (both organic and inorganic) and living molecules. Air pollution can cause diseases, allergies and even death in humans; it can also harm other living organisms such as animals and crops and it can harm the natural environment (such as climate change, ozone depletion or habitat degradation) or the built environment (such as acid rain). Both human activities and natural phenomena can contribute to air pollution.

DESCRIPTION

Globally, air quality is directly tied to the earth's climate and ecosystems. Many of the sources of air pollution are also sources of greenhouse emissions, such as the usage of fossil fuels. Pollution related disorders such as respiratory infections, heart disease, Chronic Obstructive Pulmonary Disease (COPD), stroke and lung cancer are all increased by air pollution. Growing evidence suggests that exposure to air pollution is linked to lower IQ scores, decreased cognition, a higher risk of psychiatric illnesses such as depression and poor perinatal health. Poor air quality has far reaching consequences on human health, although it mostly affects the respiratory and cardiovascular systems. Individual responses to air pollutants vary depending on the type of pollutant, the degree of exposure and the individual's health status and heredity.

Out Door Air Pollution (ODAP)

Outdoor air pollution caused by fossil fuel consumption alone kills 3.61 million people each year, making it one of the leading causes of death, with anthropogenic ozone and PM2.5 killing 2.1 million. Overall, air pollution kills around 7 million people globally each year, resulting in a global mean Loss of Life Expectancy (LLE) of 2.9 years and is the world's most serious environmental health concern, with no meaningful progress since at least 2015. In the 2008 blacksmith institute world's worst polluted places report, indoor air pollution and poor urban air quality are recognized as two of the world's worst hazardous pollution problems. The scope of the air pollution situation is significant: According to WHO, "nine out of ten people breathe air with high levels of pollutants." Although the health repercussions are severe, the manner the problem is addressed is largely haphazard or ignored.

Air pollution is expected to cost the global economy $5 trillion a year in productivity losses and reduced quality of life. However, along with health and mortality effects, they are an externality to the modern economic system and most human activities, albeit occasionally mildly regulated and monitored. To reduce air pollution, several pollution control technologies and tactics are available. To mitigate the deleterious impacts of air pollution, several international and national laws and regulations have been enacted. Some of these international efforts have been successful, such as the Montreal Protocol, which reduced the release of harmful ozone depleting chemicals and the 1985 helsinki protocol, which reduced sulphur emissions while others, such as international climate action, have been less successful. The danger of a pollutant and the amount of exposure to that pollutant determine the risk of air pollution. Exposure to air pollution can be quantified for an individual, a group, such as a neighborhood or a country's children or a whole population. For example, one would

want to assess a geographic area's exposure to hazardous air pollution while accounting for varied microenvironments and age groups. As an inhalation exposure, this can be calculated. This would take into consideration everyday exposure in a variety of situations, such as varied indoor micro-environments and outdoor places. The exposure must encompass people of all ages and demographic groupings, including infants, children, pregnant women and other vulnerable subpopulations.

The exposure to an air pollutant must integrate the concentrations of the air pollutant with regard to the time spent in each setting and the respective inhalation rates for each subgroup, playing, cooking, reading and working, spending time in traffic and so on, for each specific time that the subgroup is in the setting and engaged in specific activities. The inhaling rate of a small child, for example, will be lower than that of an adult. A young individual engaged in vigorous exercise will breathe more quickly than a child engaged in sedentary activity. The quantity of time spent in each micro environmental location, as well as the types of activities performed there, must therefore be included in the daily exposure. The concentration of air pollutant in each micro activity/micro environmental setting is added to determine exposure. Because high concentrations correspond with proximity to major roads or participation in (motorized) traffic, traffic related exposures may dominate total exposure despite short exposure times for some pollutants, such as black carbon. A significant amount of total daily exposure occurs as short peaks of high concentrations, but it is uncertain how to identify peaks, calculate their frequency and assess their health impact.

CONCLUSION

The WHO will decrease its suggested guideline limit for small particles emitted by fossil fuel combustion in 2021. The new Nitrogen Dioxide (NO_2) limit is 75% lower. Growing evidence that air pollution, even at very low levels, harms human health prompted the WHO to revise its guideline (from 10 g/m^3 to 5 g/m^3) for what it considers a safe level of particulate pollution exposure, putting the majority of the world-97.3 percent of the global population in the danger zone.