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ATMOSPHERIC POLLUTION IS A CAUSE OF SERIOUS DISEASES IN HUMAN

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Abstract
Air pollution can be defined as an alteration of air quality that can be characterized by measurements of chemical, biological or physical pollutants in the air. Therefore, air pollution means the undesirable presence of impurities or the abnormal rise in the proportion of some constituents of the atmosphere. It can be classified in 2 sections: visible and invisibleair pollution.

Keywords: Chemical, biological, pollution, atmosphere, carbon, nitrogen oxides, nature.

Introduction

Air pollution is contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere. Household combustion devices, motor vehicles, industrial facilities and forest fires are common sources of air pollution. Pollutants of major public health concern include particulate matter, carbon monoxide, ozone, nitrogen dioxide and sulfur dioxide. Outdoor and indoor air pollution cause respiratory and other diseases and are important sources of morbidity and mortality. Air pollution is a mix of hazardous substances from both human-made and natural sources. Vehicle emissions, fuel oils and natural gas to heat homes, by-products of manufacturing and power generation, particularly coal-fueled power plants, and fumes from chemical production are the primary sources of human-made air pollution. Nature releases hazardous substances into the air, such as smoke from wildfires, which are often caused by people; ash and gases from volcanic eruptions; and gases, like methane, which are emitted from decomposing organic matter in soils.

Air quality is closely linked to the earth’s climate and ecosystems globally. Many of the drivers of air pollution (i.e. combustion of fossil fuels) are also sources of greenhouse gas emissions. Policies to reduce air pollution, therefore, offer a win-win strategy for both climate and health, lowering the burden of disease attributable to air pollution, as well as contributing to the near- and long-term mitigation of climate change.

Traffic-Related Air Pollution (TRAP), a mixture of gasses and particles, has most of the elements of human-made air pollution: ground-level ozone, various forms of carbon, nitrogen oxides, sulfur oxides, volatile organic compounds, polycyclic aromatic hydrocarbons, and fine particulate matter.

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Ozone, an atmospheric gas, is often called smog when at ground level. It is created when pollutants emitted by cars, power plants, industrial boilers, refineries, and other sources chemically react in the presence of sunlight.

Noxious gases, which include carbon dioxide, carbon monoxide, nitrogen oxides (NOx), and sulfur oxides (SOx), are components of motor vehicle emissions and byproducts of industrial processes. Particulate matter (PM) is composed of chemicals such as sulfates, nitrates, carbon, or mineral dusts. Vehicle and industrial emissions from fossil fuel combustion, cigarette smoke, and burning organic matter, such as wildfires, all contain PM.

A subset of PM, fine particulate matter (PM 2.5) is 30 times thinner than a human hair. It can be inhaled deeply into lung tissue and contribute to serious health problems. PM 2.5 accounts for most health effects due to air pollution in the U.S.

Volatile organic compounds (VOC) vaporize at or near room temperature—hence, the designation volatile. They are called organic because they contain carbon. VOCs are given off by paints, cleaning supplies, pesticides, some furnishings, and even craft materials like glue. Gasoline and natural gas are major sources of VOCs, which are released during combustion.

Polycyclic aromatic hydrocarbons (PAH) are organic compounds containing carbon and hydrogen. Of more than 100 PAHs known to be widespread in the environment, 15 are listed in the Report on Carcinogens. In addition to combustion, many industrial processes, such as iron, steel, and rubber product manufacturing, as well as power generation, also produce PAHs as a by-product. PAHs are also found in particulate matter.

Air Pollution and Climate Change

Air pollution and climate change affect each other through complex interactions in the atmosphere. Air pollution is intricately linked with climate change because both problems come largely from the same sources, such as emissions from burning fossil fuels. Both are threats to people's health and the environment worldwide. Climate change affects air quality, which in turn can lead to adverse health outcomes. Disruptions to weather patterns influence our air quality by increasing and distributing air pollutants, such as ground-level ozone, fine particulates, wildfire smoke, and dust. Changes to weather seasons also impact the production, distribution, and severity of airborne allergens. The EPA's Air Quality National Summary Report states that around 100 million people living in the U.S. reside in communities where air pollution exceeds health-based air quality standards. While primarily affecting outdoor air quality, these pollutants and allergens can also impair indoor air quality by entering homes, schools, and buildings. Additionally, climate change may contribute to the increased prevalence of indoor pollutants like mold. Over its 50-plus year history, NIEHS has been a leader in air pollution research. The institute continues to fund and conduct research into how air pollution affects health and the population groups who are most affected.

Respiratory and Cardiovascular Impacts. Poor air quality can negatively affect human health. Exposure to air pollutants or airborne allergens can directly harm our respiratory and cardiovascular systems or exacerbate existing conditions in susceptible populations. Children, older adults, persons with asthma, and immunocompromised persons are most vulnerable to air quality impacts. Respiratory impacts can include asthma, respiratory allergies, and airway diseases , while cardiovascular impacts can include hypertension, coronary artery disease, heart

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attack, and stroke. Globally, millions of premature deaths are caused by air pollution. Exposure to and inhalation of ground-level ozone and particulate pollution account for tens of thousands of hospital visits each year. Symptoms of ozone and particulate pollution exposure can include chest pain, coughing, throat irritation, congestion, and reduced lung function. Similarly, higher pollen concentrations and longer growing seasons, consequences of warming temperatures, can increase sensitivity to allergens and severe allergic reactions, such as allergy-induced asthma attacks.

Cancer

A large study of more than 57,000 women found living near major roadways may increase a woman's risk for breast cancer.

Occupational exposure to benzene, an industrial chemical and component of gasoline, can cause leukemia and is associated with non-Hodgkin's Lymphoma.

A long-term study, 2000-2016, found an association between lung cancer incidence and increased reliance on coal for energy generation.

Using a national dataset of older adults, researchers found that 10-year long exposures to PM2.5 and NO2 increased the risks of colorectal and prostate cancer

Children

The NIEHS-funded Children's Health Study at the University of Southern California is one of the largest studies of the long-term effects of air pollution on children's respiratory health. Among its findings:

Higher air pollution levels increase short-term respiratory infections, which lead to more school absences.

Children who play several outdoor sports and live in high ozone communities are more likely to develop asthma.

Children living near busy roads have an increased chance of developing asthma.

Children who were exposed to high levels of air pollutants were more likely to develop bronchitis symptoms in adulthood.

Living in communities with higher pollution levels can cause lung damage

Climate-related changes to weather patterns are increasing the frequency and severity of droughts, which can create conditions for dust and dust-borne pathogens such as bacterial and fungal spores to enter homes, buildings, and schools.

Opportunities for Public Health Improvement

Changes to the built environment can be effective measures to protect human health and safeguard communities from the health effects of climate change. For example, low impact landscaping and tree cover in urban settings can help mitigate air pollution. Effective measures for improving air quality can also include transportation alternatives. Reducing the number of vehicle miles traveled while increasing carpooling, use of public transportation, and other alternative transportation options can lower the level of emissions of ozone, particulate matter, and other pollutants associated with respiratory and cardiovascular diseases. Reduced electricity use in areas that burn coal or other fossil fuels for energy production can lower exposure to heavy metals, such as mercury and lead, and nitrogen oxides and sulfur oxides.

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All in all, Air pollution is a health and environmental issue across all countries of the world but with large differences in severity. The burden of air pollution tends to be greater across both low and middle-income countries for two reasons: indoor pollution rates tend to be high in low-income countries due to a reliance on solid fuels for cooking, and outdoor air pollution tends to increase as countries industrialize and shift from low to middle incomes.

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