

Air Pollution And Health Effects



Air is essential for life itself; without it we could survive only a few minutes. It is a mixture of various gases like nitrogen, oxygen and carbon dioxide, and others in traces; along with water vapor perceptible as humidity and suspended solids in particulate form.

The atmosphere is layered in to four distinct zones. The four atmospheric layers are: Troposphere, stratosphere, mesosphere, and thermosphere.

1- **Troposphere**: The layer of air immediately adjacent to the earth's surface. All life activities occur in this zone, contains water vapor, gases and dust, and mixing time is rapid due to wind.

2- **Stratosphere**: The next layer after troposphere. Air temperature in this zone is stable, it contain two important components, water and ozone. Ozone is produced by lighting and irradiation of oxygen molecules. Ozone protects life on the earth surface by absorbing most incoming solar ultra violet radiation.

3- **Mesosphere**: the middle layer.

4- **Thermosphere**: A region of highly ionized gases and temperatures are very high.

Air pollution

Air pollution can harm us when it accumulates in the air in high enough concentrations. People exposed to high enough levels of certain air pollutants may suffer :

- Irritation of the eyes, nose, and throat.
- Wheezing, coughing, chest tightness, and breathing difficulties.
- Worsening of existing lung and heart problems, such as asthma.
- Increased risk of heart attack.

In addition, long-term exposure to air pollution can cause cancer and damage to the immune, neurological, reproductive, and respiratory systems. In extreme cases, it can even cause death.

Air pollution may be defined as any atmospheric condition in which certain substances are present in such concentrations that they can produce undesirable effects on man and his environment. These substances include gases (SO_x, NO_x, CO, HCs,etc) particulate matter (smoke, dust, fumes, aerosols) radioactive materials and many others.

Air pollution is a major environmental risk to health. By reducing air pollution levels, countries can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma.

Indoor air pollutions: - Pollutions from the housing made materials and living and working activities of the house, such as: natural radiation-radon, domestic combustion-coal gas, and human habits tobacco smoking.

Outdoor air pollution: - Pollutions from out door services and environmental mixings, such as: transportation-automobiles, industries-refineries, atomic energy, plant-nuclear, and community activities cleaning of streets.

Examples for some pollutants:

1- Sulfur Dioxide:

It is a serious problem in air pollution in the earliest days of industrialization. It has been the major problem in reducing or acidifying air pollution during the period of rapid economic growth in many countries. The main effect of sulfur dioxide is broncho constriction (closing of the airways causing increased resistance to breathing).

SO₂ and sulfates are the principal chemical species that cause acid precipitation. They may be transported long distances in the atmosphere away from their source and result in acidification of water and soils. There are other acid ingredients in air pollution, such as nitric acid, but less is known about them. These acids, though, cause a phenomenon known as acid rain, with their emission into the air by industry and motor vehicles.

2- Nitrogen Dioxide:

Nitric oxide (NO) is produced by combustion. Nitrogen dioxide (NO₂), which has greater health effects, is a secondary pollutant created by the oxidation of NO under conditions of sunlight, or may be formed directly by higher temperature combustion in power plants or indoors from gas stoves. The direct effects of nitrogen oxide include increased infectious lower respiratory disease in children (including longterm exposure as in houses with gas stoves) and increased asthmatic problems. NO₂ also provokes broncho-constriction and asthma in much the same way as ozone but it is less potent than ozone in causing asthmatic effects.

3- Particulates matter

Particle matter in the air (aerosols) is associated with an elevated risk of mortality and morbidity (including cough and bronchitis), especially among populations such as asthmatics and the elderly. As indicated, they are released from fireplaces, wood and coal stoves, tobacco smoke, diesel and automotive exhaust, and other sources of combustion.

4-Lead

It is known to be a highly toxic substance that particularly causes nerve damage. It can caused learning disabilities and neurobehavioral problems in childern. An estimated 80 – 90% of lead in ambient air is thought to be derived from the combustion of leaded petrol. Due to its effects on the behavior and learning abilities of children even at low levels of exposure, efforts throughout the world are directed at removing lead from gasoline.

5- Asbestos

It is a mineral fiber that has been used as insulation and as fire retardant in buildings. Many asbestos products have been banned, and its use is now limited. But in older buildings asbestos is still found in pipe and furnace insulation, asbestos shingles, floor tiles, textured paints, and other construction materials. If these materials are disturbed cutting, sanding or other activities, excessive air borne asbestos levels can occur. It cause Asbestosis(lung scaring), Mesothelioma (cancer of the lung and the abdominal lining) and Lung cancer.

There are many ways to reduce air pollution:

- 1- Advocate for stricter air quality regulations for contols factories.
- 2- Decrease your personal contribution to air pollution by reducing energy consumption through the use of cleaner, more efficient appliances in your home.
- 3- Use public or active (walking or bicycling) transportation.
- 4- Do regular car check up: Its important for you to go for regular check up of your car to make sure it does not consume extra fuel.
- 5- Buy energy efficient vehicles: Buy vehicles and other items that are helpful to the environment.
- 6- Plant a garden: Plant a garden that is going to give the air the nutrients that it needs to be cleaner.
- 7- Use natural gas instead of charcoal: to reduce pollution result.
- 8- Always use recyclable products: because they take less power to make than other products.
- 9- Quit smoking: quit smoking and encourage those around you to do the same.
- 10- Buy rechargeable batteries: Every year billions of batteries are sold and then disposed off after use. Buy a charger and few sets of rechargeable batteries and that should pay off in no time.
- 11- Avoid heavy exercise near busy roadways or on smoggy days.
- 12- Eat a healthy diet that contains fruits and vegetables high in antioxidants (shown to prevent some health effects of pollutants).
- 13- Use of Solar Energy: Consider using solar power instead of regular power.
- 14- Buy Green Electricity: Buy electricity generated from renewable energies i.e. hydroelectric, wind or solar power.

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