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Effects of Air Pollution on Health and Environment

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ABSTRACT

Air pollution is one of the greatest scourges of our day, not only because of its impact on climate change, but also because of its impact on public and individual health due to increased sickness and death. Many contaminants are significant contributors to human disease. Particulate matter (PM), a type of particle with a variable but extremely small diameter that enters the respiratory system through inhalation and causes respiratory and cardiovascular disorders, as well as reproductive and central nervous system dysfunctions, and cancer, is one of them. Last but not least, natural disasters and climate change caused by pollution have an impact on the geographical distribution of many infectious diseases. Only public awareness combined with a multidisciplinary approach by scientific specialists will be able to handle this problem; national and international organizations must address the rise of this threat and suggest long-term remedies.

Keywords- Environment, Air Pollution, Health Effects, and Human.

I. INTRODUCTION

The World Health Organization (WHO) defined environmental health as "those aspects of human health and disease that are determined by environmental variables" in a document published in 1989. It also refers to the theory and practice of evaluating and controlling environmental elements that may have a negative impact on one's health.

According to the WHO Regional Office for Europe, environmental health encompasses both the direct pathological effects of chemicals, radiation, and some biological agents as well as the effects (often indirect) of the broad physical, psychological, social, and cultural environment, which includes housing, urban development, land use, and transportation.

The website of the World Health Organization (WHO) on environmental health states was updated in 2016. "Environmental health is concerned with all physical, chemical, and biological factors that affect a person's behaviour. It entails evaluating and controlling environmental elements that may have a negative impact on one's health. Its goal is to avoid sickness and to create surroundings that are conducive to good health. This definition excludes behaviour that is not influenced by the environment, as well as behaviour that is influenced by the social and cultural environment, as well as heredity. "

Environmental health services are also characterized by the WHO as "environmental health policies are implemented through monitoring and control operations by these services." They also fulfill this function by supporting the use of environmentally friendly and healthy technology and behaviours, as well as advocating the improvement of environmental factors. They also play a key role in formulating and proposing new policy areas.

Environmental medicine can be seen as a medical specialization or a subset of the larger area of environmental health. Terminology isn't entirely defined, and it's used interchangeably in several European countries. Children's environmental health is an academic field that explores how early-life environmental exposures—chemical, nutritional, and social—influence health and development in children and throughout life.

II. POLLUTION AND ENVIRONMENT

Climate change and air pollution are inextricably linked. Climate change is the other side of the same coin that degrades our planet's quality. The amount of incoming sunlight is affected by pollutants such as black carbon, methane, tropospheric ozone, and aerosols. As a result, the temperature of the Earth is rising, causing ice, icebergs, and glaciers to melt.

Climate change will have an impact on the incidence and prevalence of both residual and imported illnesses in Europe. Climate and weather have a significant impact on the duration, timing, and intensity of outbreaks, as well as the global map of infectious diseases. Mosquito-transmitted parasitic or viral infections are especially sensitive to climate change, as warming shortens the pathogen’s incubation period and alter the vector's geographic map. Water warming as a result of climate change also results in a high frequency of waterborne illnesses. Recently, eliminated diseases such as cholera, poliomyelitis, tick-borne encephalitis, and malaria have emerged in Europe as a result of population migration.

Epidemics are linked to natural climate disasters like storms, which seem to be happening more frequently lately. Emerging illnesses harming public health are also linked to malnutrition and immune system disequilibrium.

The Chikungunya virus "flew" from the Indian Ocean to Europe, with outbreaks of the disease confirmed in Italy and autochthonous cases confirmed in France. Following flooding, there appears to have been an increase in cryptosporidiosis in the United Kingdom and the Czech Republic.

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Aerosols, as previously said, are microscopic substances that have a significant impact on the climate. They have reduced the global temperature over the last 30 years by dissipating sunlight (the albedo phenomenon) by dispersing a quarter of the sun's rays back to space.

III. APPROACH PROBLEM

Multiple human activities influence the environment. Hence, the interactions between humans and their physical surroundings have been intensively explored. The biotic (living beings and microbes) and abiotic (inanimate objects) worlds collide in the environment (hydrosphere, lithosphere, and atmosphere).

Pollution is defined as the introduction of substances that are hazardous to people and other living organisms into the environment. Pollutants are toxic solids, liquids, or gases that are created in higher-than-normal proportions and degrade our environment's quality.

Human activities pollute the water we drink, the air we breathe, and the soil in which plants grow, all of which have a negative impact on the environment. Although the industrial revolution was a big success in terms of technology, society, and the provision of a wide range of services, it also resulted in the release of massive amounts of pollutants into the air that are hazardous to human health. Without a doubt, global environmental degradation is seen as a multifaceted international public health issue. This big issue is linked to social, economic, and legislative concerns as well as lifestyle choices. Clearly, in our time, urbanisation and industrialisation are reaching unprecedented and unsettling levels throughout the world. Anthropogenic air pollution is one of the world's most serious public health threats, causing around 9 million fatalities each year.

Without a doubt, all of the aforementioned are directly linked to climate change, and the repercussions for humans in the event of danger can be serious. Climate change and its consequences, such as food safety concerns, ice and iceberg melting, animal extinction, and plant damage, have a significant impact on different ecosystems.

Air pollution has a variety of negative health consequences. Even on days when air pollution is low, vulnerable and sensitive people's health can be harmed. COPD (Chronic Obstructive Pulmonary Disease), cough, shortness of breath, wheezing, asthma, respiratory disease, and high hospitalization rates are all linked to short-term exposure to air pollution (a measurement of morbidity).

Chronic asthma, pulmonary insufficiency, cardiovascular illnesses, and cardiovascular mortality are all long-term impacts of air pollution. Diabetes appears to be induced following long-term air pollution exposure, according to a Swedish cohort study. Furthermore, air pollution appears to have a number of negative health impacts in early human life, including respiratory, cardiovascular, behavioural, and perinatal issues, which can lead to infant mortality or chronic disease later in life.

The higher risk of morbidity and mortality has been recognized in national reports. These investigations, which were done in a variety of locations throughout the world, reveal a link between daily particulate matter (PM) concentration ranges and daily mortality. Climate change and global warming have the potential to exacerbate the problem. Furthermore, increased hospitalization (a measure of morbidity) has been observed among the aged and vulnerable for a variety of causes. Because fine and ultrafine particulate matter can penetrate the deepest sections of the airways and more easily reach the circulation, they appear to be linked to more serious disorders.

Air pollution mostly affects people who live in metropolitan cities, as traffic emissions contribute the most to air pollution degradation. There is also the risk of industrial accidents, in which the spread of a poisonous fog can be devastating to the local populace. Many factors influence pollution dispersion, the most important of which are atmospheric stability and wind.

Over population and unregulated urbanization, combined with the rise of industrialization, make the problem more acute in emerging countries. This results in poor air quality, especially in nations where there are social inequities and a lack of understanding about environmental sustainability. Due to poor salaries, people are forced to use low-quality, polluting fuels such as wood or solid fuel for domestic purposes. It's worth noting that three billion people use the aforementioned energy sources for their everyday heating and cooking needs. Because they are exposed to indoor air pollution for longer periods of time in developing nations, the women of the household appear to be at the greatest risk of illness development. Due to its rapid industrial expansion and overpopulation, China is one of the Asian countries with major air pollution problems. Fine particles have been linked to lung cancer mortality in China. Long-term exposure, as previously noted, is linked to negative effects on the cardiovascular system. It's worth noting, however, that cardiovascular diseases are more common in industrialized and high-income countries than in developing low-income countries with high levels of air pollution. Extreme air pollution has been documented in India, where the air quality has deteriorated to dangerous levels. New Delhi is one of India's most polluted cities. Because of the limited visibility caused by air pollution, flights into and out of New Delhi International Airport are frequently cancelled. Due to India's rapid industrialization, urbanization, and increased usage of motorbikes, pollution is occurring in both urban and rural areas. Nonetheless, in India and Nepal, biomass combustion is a major cause of household air pollution due to heating and cooking demands and habits. In India, there is spatial variability, as places with varying climatological circumstances, population, and education levels produce different indoor air quality, with greater

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PM2.5 levels recorded in North Indian states (557–601 g/m3) compared to the Southern States (183–214 g/m3). The frigid temperature of northern India may be the main cause of this, as it necessitates more time at home and more heating than the warm environment of southern India. In India, household air pollution is linked to serious health problems, particularly in women and young children who spend more time indoors. Women are more likely to get chronic obstructive pulmonary disease (CORD) and lung cancer, while young children under the age of five are more likely to develop acute lower respiratory disease.

The accumulation of air pollution, particularly sulphur dioxide and smoking, reached 1,500 mg/m3 in December 1952 in London and in 1963 in New York City, resulting in an increase in the number of deaths (4,000 deaths) in both cities (400 deaths). On the basis of outdoor pollution monitoring in six US metropolitan centres, a link between pollution and mortality was discovered. In every case, it appears that fine, inhalable, and sulphate particle levels were more closely linked to mortality than total particulate pollution, aerosol acidity, sulphur dioxide, or nitrogen dioxide levels.

Furthermore, extreme pollution levels have been reported in Mexico City and Rio de Janeiro, with Milan, Ankara, Melbourne, Tokyo, and Moscow following closely behind.

Different types of interventions should undoubtedly be considered based on the scale of the public health impact. There have been reports of success and efficacy in reducing air pollution, particularly at the local level. Appropriate technological techniques are employed given the source and nature of the emission, as well as its impact on health and the environment. Schwela and Köth-Jahr discuss the role of point and non-point sources in air pollution mitigation. A thorough emission inventory must, without a doubt, record all sources in a given area. As previously indicated, geography and meteorology should be considered in addition to the aforesaid sources and their nature. The evaluation of control policies and methods is frequently stretched from a local to a regional to a global scale. Pollution in the air can be diffused and carried from one location to another. Air pollution management refers to reducing or eliminating air pollutants that have a negative impact on our health or the environment. Actions are taken by private and governmental companies and bodies to ensure air quality. The WHO and EPA created air quality standards and guidelines for various pollutants as a tool for air quality management. To identify the problematic areas, these criteria must be matched to the emissions inventory standards using causal analysis and dispersion modeling. In most cases, inventories are based on a mix of actual observations and emissions modeling.

We will use the use of catalytic converters in automobiles as an example of source control strategies. These are devices that use catalysis and redox processes to convert pollutants and hazardous gases produced by combustion engines into less dangerous pollutants. In order to decrease traffic congestion during rush hour, the use of private cars was prohibited in Greece by tracking their licence plates.

When it comes to industrial emissions, collectors and closed systems can help restrict pollutants to the bare minimum required by law.

Current air quality improvement initiatives necessitate a calculation of the economic worth of the benefits derived from proposed programmes. These planned public-sector programmes and directives are accompanied by guidelines that must be followed.

Air quality limit values, or AQLVs (Air Quality Limit Values), are used to set off planning claims in Europe. The NAAQS (National Ambient Air Quality Standards) in the United States establish national air quality limit levels. Despite the fact that standards and directives use diverse mechanisms, tremendous progress has been made in reducing overall emissions and their health and environmental consequences. The European Directive establishes global geographical air quality criteria based on the severity of the air quality problem and records all sources of pollutants and their precursors, whereas the United States establishes global geographical air quality criteria based on the severity of the air quality problem and records all sources of pollutants and their precursors.

In this vein, money has been used to fund, directly or indirectly, air quality projects as well as the technical infrastructure needed to maintain excellent air quality. These strategies are based on a database inventory of air quality environmental planning awareness initiatives. Furthermore, air pollution measurements for automobiles, machines, and factories in metropolitan areas are also possible.

Only if technological progress is able to meet the needs of society will it be successful. In this sense, technology must mirror the decision-making methods and procedures of individuals involved in risk assessment and evaluation, and serve as a facilitator in giving information and evaluations to enable decision-makers to make the best possible decisions. To summarise the above, several factors must be considered when designing an effective air quality control strategy: environmental factors and ambient air quality conditions, engineering factors and air pollutant characteristics, and finally, economic operating costs for technological improvement as well as administrative and legal costs. When it comes to the economic component, neoliberal ideals and competition offer a solution to environmental issues.

The deployment of a discussion has been sparked by the rise of environmental governance and technological advancement. Environmental politics has sparked debate and disagreement among political parties, scientists, the media, and government and non-government organizations. Radical environmental activism actions and movements have emerged. Many times, the rise of new information and communication

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technologies (ICTs) is analyzed to see if and how they have changed communication and social movements like activism. The term "digital activism" has been thrown around a lot since the 1990s, and it's been used for a lot of different things. Currently, a variety of digital tools can be employed to create digital activism results on environmental issues. More precisely, gadgets with online capabilities, such as computers or cellphones, are being used to effect political and social change.

In this study, we look at the origins of environmental pollution and how it affects public health, as well as possible solutions and interventions that environmental legislators and decision-makers might find useful.

IV. PARTICULATE MATTER (PM) AND EFFECTS ON HUMAN HEALTH

Studies concentrating on either short-term (acute) or long-term (chronic) PM exposure have found a link between particulate matter (PM) and negative health impacts.

Particulate matter (PM) is created in the atmosphere, mostly as a result of chemical interactions between contaminants. The size of particles has a big impact on their penetration. The United States Environmental Protection Agency defines Particulate Matter (PM) as a word for particles. Particulate matter (PM) pollution is made up of particles with a diameter of 10 micrometres (m) or less, known as PM10, and extremely fine particles with a diameter of 2.5 micrometres (m) or less, known as PM2.5.

Particulate matter is made up of microscopic liquid or solid droplets that can cause major health problems if breathed in. After inhalation, particles with a diameter of less than 10 micrometres (PM10) can penetrate the lungs and potentially reach the bloodstream. PM2.5, or fine particles, represents a significant health risk (Table 1).

Table 1

Penetrability according to particle size.

Particle size	Penetration degree in human respiratory system
>11 μm	Passage into nostrils and upper respiratory tract
7–11 μm	Passage into nasal cavity
4.7–7 μm	Passage into larynx
3.3–4.7 μm	Passage into trachea-bronchial area
2.1–3.3 μm	Secondary bronchial area passage
1.1–2.1 μm	Terminal bronchial area passage
0.65–1.1 μm	Bronchioles penetrability
0.43–0.65 μm	Alveolar penetrability

The health consequences of PM have been extensively studied in epidemiological research. In both short-term and long-term studies, a link was discovered between PM2.5 exposure and acute nasopharyngitis. Additionally, years of long-term exposure to PM have been linked to cardiovascular illness and neonatal death.

Due to a lack of spatially resolved daily PM2.5 concentration data, these studies rely on PM2.5 monitors and are limited in terms of study region or city area, and hence are not representative of the full population. According to a recent epidemiological study conducted by the Department of Environmental Health at Harvard School of Public Health (Boston, MA), as PM2.5 concentrations vary spatially, an exposure error (Berkson error) appears to be produced, and the relative magnitudes of the short- and long-term effects are not yet fully understood. short- and long-term human exposures, the researchers created a PM2.5 exposure model using remote sensing data. This model allows for spatial resolution of short-term effects as well as the evaluation of long-term effects over the entire population.

In addition, long-term chronic consequences such as respiratory illnesses and immune system dysfunction are recorded. People with asthma, pneumonia, diabetes, and respiratory and cardiovascular illnesses are particularly susceptible to PM's effects. Because their size allows them to pierce interior spaces, PM2.5 and PM10 are significantly linked to a variety of respiratory system disorders. According to their chemical and physical qualities, the particles create hazardous consequences. Organic (polycyclic aromatic hydrocarbons, dioxins, benzene, 1-3 butadiene) and inorganic (carbon, chlorides, nitrates, sulphates, metals) constituents of PM10 and PM2.5 can be found in nature. According to kind and size, particulate matter (PM) is categorised into four groups (Table 2).

Table 2

Types and sizes of particulate Matter (PM).

Type		PM diameter [μm]
Particulate contaminants	Smog	0.01–1
	Soot	0.01–0.8
	Tobacco smoke	0.01–1
	Fly ash	1–100
	Cement Dust	8–100
Biological Contaminants	Bacteria and bacterial spores	0.7–10
	Viruses	0.01–1
	Fungi and molds	2–12
	Allergens (dogs, cats, pollen, household dust)	0.1–100
Types of Dust	Atmospheric dust	0.01–1
	Heavy dust	100–1000
	Settling dust	1–100
Gases	Different gaseous contaminants	0.0001–0.01

PM in the atmosphere is a gas contaminant. Smog, soot, cigarette smoke, oil smoke, fly ash, and cement dust are examples of particulate pollutants.

Microorganisms (bacteria, viruses, fungi, mould, and bacterial spores), cat allergens, house dust and allergens, and pollen are examples of biological contaminants.

Dust is divided into three categories: suspended air dust, settling dust, and heavy dust.

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Finally, due to their small size, the half-lives of PM10 and PM2.5 particles in the atmosphere are extended, allowing for their long-term suspension in the atmosphere and even their transfer and spread to distant locations where people and the environment may be subjected to the same level of pollution. They have the ability to alter the nutritional balance in aquatic ecosystems, cause forest and crop damage, and acidify water bodies.

As previously established, PM2.5 particles cause more harmful health impacts due to their small size. The creation of "haze" in various metropolitan regions is mostly caused by the aforementioned small particles.

V. AIR POLLUTION'S ENVIRONMENTAL EFFECTS

Not only does air pollution impair our health, but it also harms the environment in which we live. The following are the most significant environmental effects:

Acid rain is defined as wet (rain, fog, or snow) or dry (particulates and gas) precipitation with dangerous levels of nitric and sulfuric acids. They can harm plants and plantations, as well as structures and outdoor sculptures, constructions, and statues, by acidifying the water and soil conditions.

Fine particles scattered in the air cause haze, which reduces the transparency of the atmosphere. Gas emissions in the air from industrial buildings, power plants, autos, and trucks are to blame.

As previously stated, ozone exists at both the ground and upper levels of the Earth's atmosphere (stratosphere). The Sun's dangerous ultraviolet (UV) rays are shielded by stratospheric ozone. Ground-level ozone, on the other hand, is a pollutant that is detrimental to human health. Unfortunately, ozone-depleting compounds eventually deplete stratospheric ozone (i.e., chemicals, pesticides, and aerosols). If the protective stratospheric ozone layer thins, UV radiation will reach our planet, causing harm to humans (skin cancer) and agriculture. Ozone penetrates the stomata of plants, causing them to close and limit CO2 transport, resulting in a reduction in photosynthesis.

Climate change is a serious issue that affects everyone on the planet. The "greenhouse effect," as it is known, maintains the Earth's temperature constant. Unfortunately, anthropogenic activities have damaged this temperature-controlling mechanism by emitting significant volumes of greenhouse gases, and global warming is worsening, with negative consequences for human health, animals, forests, wildlife, agriculture, and water quality. According to a report, global warming is putting impoverished people's health at risk.

As temperatures rise, people living in poorly designed buildings in warm-climate nations are at a higher risk of heat-related health problems.

Toxic contaminants from the air, soil, and water ecosystems burden wildlife, causing animals to develop health problems when exposed to excessive quantities of pollutants. There have been reports of infertility and birth defects.

Eutrophication occurs when elevated levels of nutrients (particularly nitrogen) encourage the blossoming of aquatic algae, which can result in a loss of fish diversity and mortality.

Without a doubt, there is a critical level of pollution that an ecosystem may accept without being destroyed, which is linked to its ability to neutralise acidity. This load was set at 20 kg/ha/year by the Canadian Acid Rain Program.

As a result, air pollution has negative consequences for both soil and water (121). The impact of PM as an air contaminant on crop output and food productivity has been documented. Its effects on aqueous bodies are linked to the survival of living beings and fish, as well as their capacity for productivity.

Plants exposed to the effects of ozone show a disruption in photosynthetic rhythm and metabolism.

Acid rain is caused by sulphur and nitrogen oxides, which are hazardous to plants and marine organisms. Finally, as previously said, the toxicity of lead and other metals poses the greatest harm to our ecosystems (air, water, and soil) and living organisms.

VI. HEALTH EFFECTS OF AIR POLLUTION

Ground-level ozone and particulate matter are the most common air contaminants (PM). There are two types of pollution in the air:

The term "outdoor pollution" refers to pollution that occurs in the open air.

The pollution caused by the combustion of fuels in the home is known as "indoor pollution."

People who are exposed to excessive levels of air pollution develop disease symptoms and states of varying severity. These health impacts are divided into two categories: short-term and long-term.

Old people, children, and people with diabetes who have a predisposing heart or lung illness, especially asthma, are vulnerable populations that need to be aware of health protective measures.

According to a recent epidemiological study from the Harvard School of Public Health, the relative magnitudes of the short- and long-term effects have not been completely defined due to varying epidemiological methodology and exposure errors. New models are presented for more effectively analysing short-and long-term human exposure data. As a result, in this section, we discuss the more prevalent short- and long-term health consequences, as well as general concerns about both types of impacts, because they are typically reliant on environmental factors, dose, and individual sensitivity.

Short-term side effects include irritation of the eyes, nose, skin, and throat; wheezing; coughing; chest tightness; and breathing difficulties; as well as more serious conditions like asthma, pneumonia, bronchitis,

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and lung and heart problems. Air pollution can also cause headaches, nausea, and dizziness in people who are exposed to it for a short period of time.

Long-term exposure to pollutants can exacerbate these issues by harming the neurological, reproductive, and respiratory systems, as well as causing cancer and, in rare cases, death.

The long-term consequences are chronic, spanning years or even a lifetime, and can even result in death. Furthermore, the long-term toxicity of various air contaminants may cause a variety of malignancies.

As previously indicated, respiratory illnesses are closely linked to air pollution intake. These contaminants will enter the body through the airways and build up in the cells. The pollutant component involved, as well as its source and dose, should be linked to damage to target cells. Country, region, season, and time all have an impact on one's health. In connection to the foregoing criteria, prolonged exposure to the pollutant should predispose to long-term health impacts.

Particulate matter (PMs), dust, benzene, and oxygen (O3) are all known to harm the respiratory system. In addition, if you already have a respiratory ailment like asthma, you're at a higher risk. People with a predisposed illness state are more likely to experience long-term repercussions. When contaminants poison the trachea, voice changes can occur after a short period of time. Air pollution can cause chronic obstructive pulmonary disease (COPD), which increases morbidity and death. The long-term effects of traffic, industrial air pollution, and fuel combustion have the greatest influence on COPD risk.

A variety of cardiovascular consequences have been identified after being exposed to air pollution. Changes in blood cells as a result of long-term exposure may have an impact on heart function. Long-term exposure to traffic emissions has been linked to coronary arteriosclerosis, whereas short-term exposure has been linked to hypertension, stroke, myocardial infracts, and heart failure. Long-term exposure to nitrogen oxide has been linked to ventricular hypertrophy in humans (NO_2). Long-term exposure to air pollution has been linked to neurological consequences in both adults and children.

Long-term air pollution appears to be linked to psychological difficulties, autism, retinopathy, prenatal development, and low birth weight. The etiologic agent of neurodegenerative illnesses (Alzheimer's and Parkinson's) is unknown, while prolonged exposure to air pollution is thought to be a cause. Pesticides and metals, as well as nutrition, are mentioned as etiological variables. Oxidative stress, protein aggregation, inflammation, and mitochondrial dysfunction in neurons are all involved in the development of neurodegenerative diseases (Figure 1).

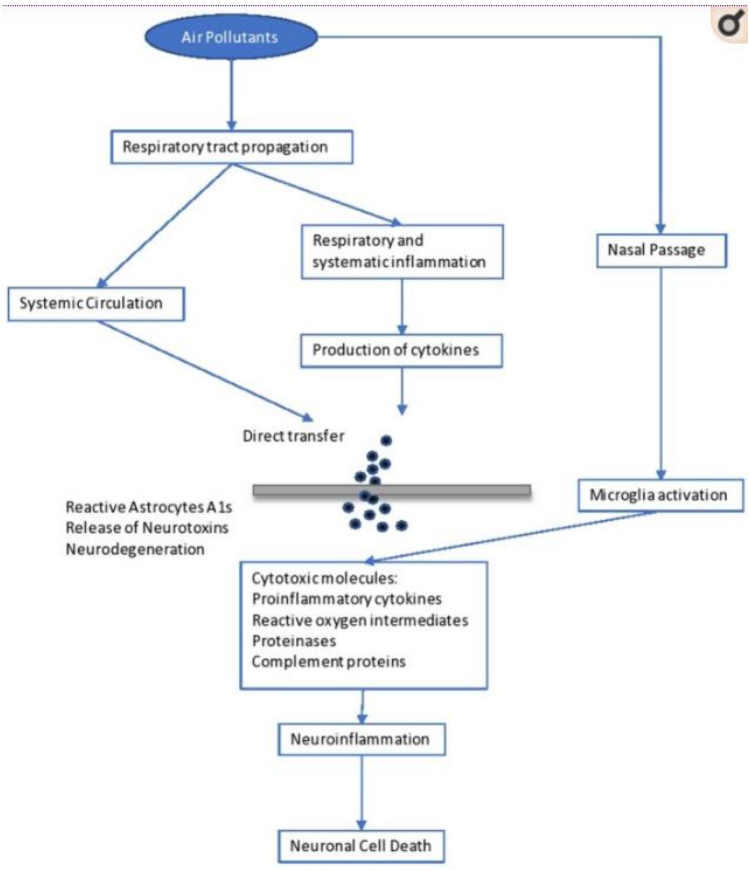

Figure-1

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VII. IMPACT OF AIR POLLUTANTS ON THE BRAIN

Long-term exposure to a severely polluted location in Mexico caused brain inflammation in dogs. As an immediate response to PNC on the IL-6 level, indicators of systemic inflammation (IL-6 and fibrinogen) were observed to be raised in human adults, presumably contributing to the creation of acute-phase proteins. The mechanisms implicated in the neurological abnormalities produced by long-term air pollution appear to include the growth of atherosclerosis and oxidative stress. Inflammation is a result of oxidative stress and appears to be implicated in developmental maturation delay, impacting numerous organs. Other elements, too, appear to play a role in developmental maturation, which determines the susceptibility to long-term air pollution. Birth weight, maternal smoking, genetic background, social milieu, and educational level are among them.

Another decisive factor, beginning with breast-feeding, is food. Antioxidants, which play a significant role in human protection against air pollution, are mostly obtained from diet. Antioxidants are free radical scavengers that prevent free radicals from interacting in the brain. Similarly, a person's genetic background may influence their sensitivity to the oxidative stress pathway. In asthmatic children homozygous for the GSTM1 null allele, antioxidant treatment with vitamins C and E appeared to modify the effect of ozone. The innate immunological Toll-like receptor 2 is up regulated by inflammatory cytokines secreted in the periphery (e.g., respiratory epithelia). In mice exposed to ambient particulate matter in Los Angeles (CA, USA), such activation and subsequent events leading to neurodegeneration have recently been demonstrated in lung lavage. Neurodevelopmental morbidities have been identified in children who have been exposed to lead. Aggressive and delinquent conduct, lower IQ, learning difficulties, and hyperactivity were all observed in these children. The scientific community has petitioned the Centers for Disease Control and Prevention (CDC) to lower the existing screening standard of 10 g/dl because no level of lead exposure appears to be "safe."

It's vital to note that poor air quality has an impact on the immune system, creating malfunction and neuroinflammation. Nonetheless, immunoglobulin's (IgA, IgM) and the complement component C3 levels in the blood have increased. Another concern is that air pollution affects antigen presentation because stimulatory molecules like CD80 and CD86 are unregulated on macrophages.

As the most external layer of our body, skin serves as a protection against ultraviolet radiation (UVR) and other contaminants. Pigmented spots on our skin can be caused by traffic-related pollutants such as PAHs, VOCs, oxides, and PM. On the one hand, as previously indicated, when pollutants enter the body through the skin or are inhaled, they cause harm to the organs, as some of these pollutants are mutagenic and carcinogenic, affecting the liver and lungs in particular. In polluted metropolitan areas, however, air pollutants (including those in the troposphere) diminish the harmful effects of ultraviolet radiation UVR. Skin ageing, psoriasis, acne, urticarial, eczema, and atopic dermatitis may be caused by air pollutants absorbed by the human skin, which are mainly induced by exposure to oxides and photochemical smoke. Skin-aging agents such as PM and cigarette smoking cause spots, dyschromia, and wrinkles. Finally, pollution has been linked to skin cancer.

When fetuses and children are exposed to the risks listed above, they have a higher rate of morbidity. There have been reports of foetal growth problems, low birth weight, and autism.

The eye is another external organ that could be damaged. Contamination is most commonly caused by suspended contaminants, which can cause asymptomatic eye damage, irritation, retinopathy, and dry eye syndrome.

VIII. DISCUSSION

Dr. Tedros Adhanom Ghebreyesus, WHO General Director, dubbed air pollution a "silent public health emergency" and "the new tobacco" during the first WHO Global Conference on Air Pollution and Health in 2018.

Children are, without a doubt, extremely vulnerable to air pollution, particularly during their growth. Air pollution has a negative impact on our lives in a variety of ways.

Air pollution-related diseases have a significant economic impact as well as a societal impact owing to absences from productive job and school.

Despite the challenge of eliminating anthropogenic environmental contamination, a viable solution might be envisioned as a close partnership between authorities, bodies, and doctors to bring the issue under control. Governments should disseminate appropriate information, educate citizens, and involve professionals in these concerns in order to successfully control the rise of the problem.

Air pollution reduction technologies must be devised and implemented in all sectors and power plants. The Kyoto Protocol of 1997 established a main goal of lowering GHG emissions to less than 5% by 2012. The Copenhagen summit in 2009 was followed by the Durban summit in 2011, where it was determined to continue on the same path. Many countries have ratified the Kyoto Protocol and following ones. China was one of the first countries to accept this critical protocol for the world's environmental and climate "health." As is well known, China's economy is rapidly increasing, and its GDP (Gross Domestic Product) is predicted to be quite high by 2050, which is the year the Kyoto Protocol for reducing greenhouse gas emissions is set to expire. The Paris Pact of 2015, announced by the UNFCCC, is a more recent

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international agreement of critical relevance for climate change (United Nations Climate Change Committee). A large number of UN (United Nations) countries, as well as European Union countries, have approved the newest pact. Parties should promote actions and efforts to improve various elements of the topic in this vein. Increasing education, training, public awareness, and public participation are some of the key steps for maximising the chances of achieving the crucial aims and goals on climate change and environmental degradation. Without a question, technology advancements make our world easier, and while it may appear difficult to prevent the adverse effects of gas emissions, we can limit their usage by pursuing dependable solutions.

In conclusion, a global preventative programme should be developed to combat anthropogenic air pollution as a supplement to the proper management of air pollution's detrimental health impacts. In order to effectively address the problem, sustainable development techniques should be used in conjunction with study findings.

For efficient pollution management, international cooperation in terms of research, development, administration policy, monitoring, and politics is critical at this time. Air pollution legislation has to be updated and harmonised, and policymakers should propose the creation of a significant weapon for environmental and health protection. As a result, the central argument of this article is that we should concentrate on establishing local organisations to encourage experience and practise, and then extrapolate these to the worldwide level through the development of effective regulations for ecosystem management.

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