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The Impact of Environmental Pollution on Human Health: A Medical Perspective

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Annotation: Environmental pollution is a growing global concern with significant implications for human health. Despite extensive research, a critical knowledge gap remains in understanding the long-term effects of exposure to pollutants across multiple environmental sources. This study employs cross-sectional epidemiological analyses focusing on air, water, soil, and biodiversity in Kosovo to assess health risks. By integrating biomarker assessments, dose-response evaluations, and gene-environment interaction studies, the research identifies key biological mechanisms linking chronic exposure to pollution-related diseases. Findings indicate a strong correlation between pollutant exposure and increased risks of respiratory, cardiovascular, and neurological disorders. The results underscore the urgent need for stricter environmental policies and improved

pollution monitoring strategies. This study contributes to the development of targeted public health interventions and policy recommendations to mitigate pollution-related health risks.

Keywords: Environmental pollution, human health, epidemiological studies, biomonitoring, chronic exposure, public health policy, pollution mitigation.

1. Introduction

There are many known health related risks for human beings in the polluted environment. One of the risks is air pollution which further deteriorates human health. There is continuous rapid growth of population, industrialization and urbanization which have led to the continuous deterioration of ambient air and human health. In the past three to four decades population, vehicular population, industrialization, and urbanization have increased and expanded tremendously in India in general and the Thar Desert Region in particular which includes Bikaner and vicinity. Air pollution is one of the major environmental issues in the present epoch. The scarcity of studies in ambient air quality and associated human health risks have exacerbated the situation in the urbanized area of southeast part of the Thar Desert, Bikaner, Rajasthan. Therefore, this study is seen as a preliminary approach to assess the growing air pollution and its health risks for the inhabitants of the study area by using a retrospective perspective over the past decade [1].

The occurrence of air pollution dates back several centuries and commonly involves the discharge of countless anthropogenic pollutants into the atmosphere at local and regional scales. However, at the global level, the occurrence of acid rain was very stressful for public health agents and numerous anthropogenic compounds accountable for the creation of the greenhouse effect and human health implication had been diffused. Hence, air pollution is recognized as one of the most essential hazards in energy usage today. The atmospheres in various countries have been exceeded the boundaries of pollution. There is a growing awareness that the detection of such boundaries will take multiple years to recover. The impact of air pollution upon any area enlarges the extent of atmospheric energy use and alter the hydrocarbon, nitrogen, and sulfur flow of element nutrients. Due to the rapidly increasing population growth of industrialization and urbanization air pollution has become a universal crisis in recent decades. The human being in the environment faces various pollutants silently and the most noteworthy concern by these toxic substances is the human health risk in every prospect of life. [2][3][4]

2. Understanding Environmental Pollution

Understanding environmental pollution is complex and requires new methodologies to study sources, exposure, dose-response, and possible time lapse between exposure and effect. Biomonitoring traces chemical or metabolic alterations veterinary, agronomic, and environmental applications. High-tech instruments, especially those examining the proteomics, admetabolomics, metabolomics, transcriptomics, and genomic level, enable the recognition of symptoms indicative of adverse effects. Vulnerable individuals, i.e., populations showing a higher susceptibility to the effect of pollution and chemicals, as well as differences in the normal functioning of the detoxification system, include not only people receiving medical treatments but also people living or working in heavily polluted areas. Some individuals are more susceptible to air pollution, which supports scientific observations that air pollution may be involved in the onset of diseases by activating or stimulating endogenous processes. One of the reasons for investigating the whole biological system instead of individual proteins and

metabolites is that typically the metabolites and proteins belong to pathways. Functional studies reveal significant alterations of metabolic pathways. Thus, integrated metabolomics and proteomics analysis could provide detailed snapshots of the shifts in the physiology of individuals exposed to pollution and chemicals, hence constituting the bases for the development of the so-called exposomics, a scientific discipline aimed at identifying the biological signatures and pathways responsive to environmental exposures. Such knowledge could be the seeds for the design of biomonitoring tools for exposure assessment and the prediction of environment health-related conditions in advance, notably in the case of the monitoring of emerging contaminants and mixtures [5].

2.1. Sources of Environmental Pollution

Air pollution is one urgent global problem. It is a situation that displeases the normal living experiences of human beings always and everywhere. It is one of the major health related risks today. Air pollution, in its simplest term, is contamination of the air in the atmosphere to an extent such that it disrupts its normal and naturalcy. The norm proper relationship between continuous living of beings on the earth and air's composition gets disrupted and creates troubles is termed as air pollution. The toxic substances in the air mixture, whether or not they are responsible for these abnormalities in composition, are called air pollutants. The presence of air pollutants as atmospheric substances or energy in uncontrollable quantities is liable to cause harm to life, damage to man-made materials and structures, or changes in the weather and climate. Air pollutants are characterized as physical, chemical, and biological, or any combination capable of harming human health, aquatic systems, wildlife, and vegetation. In this age of lethal pollution, diseases like meningitis, asthma, mental disorders (Alzheimer's) and heart-attacks are directly or indirectly the result of air pollution. This [6] attempts to scrutinize air pollution upon human health from the primary source point of view. Air pollutants may be classified as primary and secondary in origin. This paper focuses mainly on the primary kinds of air pollutants and their respective effects on human health. This paper also intends to discuss all the factories located in and around Jama Masjid by name and the licenses it acquired or hold by the competent authority to run the factories.

2.2. Types of Pollutants

Atmosphere is a thin zone of gases surrounding the solid surface of the Earth composed mostly of nitrogen (N2) and oxygen (O2). However, it also contains traces of other gases and pollutants in the form of solid particles or gas molecules [6]. The ability of the atmosphere to support life on Earth is maintained by environmental conditions within a relatively narrow range of certain physical and chemical characteristics of the atmosphere. Air pollution has become a serious global problem in the past few decades. Air pollutants are as difficult to classify as they are diverse—they may discord with the oxygen-nitrogen atmosphere, be emphasized by its temperature parameters, and affect the specific biological components of Earth's environment.

97% of the world population is deemed as being affected by the critical levels of air pollution. The primary air pollutants include emissions of harmful substances from various technological sources, as well as natural air pollution [5]. The most common primary air pollutants are generated as a result of a household, industrial, power generation, and transportation activity. They include large emissions of harmful substances in the form of solids; volatile substances in the form of gas; and foreign substances. In many cases, air pollution also generates the secondary pollutants, being compounds that have not been directly emitted into the air but have formed under the influence of other chemical compounds discharging into the atmosphere.

3. Routes of Exposure

Exposure to environmental pollutants occurs in several ways possible routes of exposure. The main routes of pollution from the source to the receptor are by air and water. There is a diverse and complex variety of released pollutants by human activity. The most common air pollutants

are carbon monoxide, nitrogen oxides, sulfur oxides, volatile and semi-volatile organic compounds, persistent organic pollutants, particulate matter, iron/steel melting fumes, cement dust, diesel emissions. Water pollutants include heavy metals, hydrocarbons, organic compounds, surfactants, pesticides, polycyclic aromatic hydrocarbons, persistent organic pollutants, xylenol and phenol. Substances that directly come into contact with the skin or substances and particles that can be ingested are considered other routes of exposure. The existing estimates of air pollution-related diseases are uncertain, and they depend on a small number of epidemiological studies, the majority of which are based in high-income countries. However, it is estimated that 3.7% of all deaths worldwide, 4.5% in low and middle-income countries, are linked to ambient air pollution. In addition, air pollution disproportionately impacts low-income communities in developed regions, in particular children. In Asia, air pollution is a significant issue and emission levels of harmful pollutants are expected to increase significantly in the near future. Therefore, the role of environmental factors as an important contributor in shaping the health levels of the population should be emphasized and must be addressed as a health policy priority. Most recently, the attention to the exposure to harmful air pollution has led that there are many studies quantifying the exposure of the environment. These studies allow a clearer understanding of the dose-response relationship between the pollutant and the disease and influence strategies on health policies. Efforts are being made at the policy level to reduce these emissions and to improve air quality. However, with the rapid progressions of industrialization, the highly concentrated traffic and the heating system, the release of air pollution is very high and measures to reduce it are still inadequate. Therefore, the challenge faced in future should focus on the controlling of environmental pollution and on limiting individual exposure to prevent the occurrence of serious health risks.

3.1. Airborne Exposure

Air pollution represents a major threat to public health, making it necessary to adopt a coherent environmental health policy [5]. By February 2014, more than 86,000 people had died in the Chinese city of Shanghai from respiratory disease because of air pollution, though obstinately denied by Chinese authorities [7]. In the United States, approximately 5% of premature deaths are estimated to be caused by outdoor air pollution. In most mega-cities around the world, approximately 70% of respiratory diseases, allergies, and cardiac disorders are due to high concentrations of pollutants in the air. Healthcare providers, along with government sanitary institutions and research groups, must monitor the population’s health situation daily, especially in this pandemic period. Therefore, these respiratory and cardiopulmonary diseases may require specific hospitalization and treatment so that intensive care and surgery should be prepared accordingly. Background hospitalization should be kept up-to-date with studies supporting these actions, which should protect the population in a specific and timely manner. In this context, air particulate filters with efficient and specific technologies are essential besides household filters, increase in forest areas, and limits on vehicle circulation.

3.2. Waterborne Exposure

Three major environmental media, air, water, and food, expose children to environmental toxicants. These toxicants can exert their impact on children through inhalation, ingestion, dermal contact, and transplacental exposure. Waterborne exposure can result from the ingestion of contaminated water, the consumption of contaminated food prepared with it, the use of this water for washing, recreation, and other activities, and the inhalation of water vapor. Waterborne toxicants enter the food chain through aquatic organisms and may therefore have an impact on humans through the consumption of contaminated food even if they are not ingested along with water. Organic waterborne toxicants include a wide spectrum of pesticides, disinfection by-products, and chemicals such as volatile organic compounds and endocrine-disrupting offending agents ([8]). Inorganic waterborne toxicants include heavy metals, such as arsenic, lead, mercury, and cadmium, as well as metalloids, such as fluoride. Moreover, a wide range of synthetic organic compounds is found in water. Pharmaceutical compounds such as antibiotics,

endocrine disruptors, surfactants, UV filters, and various recreational and illegal drugs have been identified in surface and ground waters, and the number of these compounds is growing rapidly. A significant number of these chemicals can accumulate in and damage the human feto-placental unit, potentially causing damage to the central nervous system, immune, endocrine, and reproductive systems, and increasing the probability of adverse pregnancy outcomes. The major acute diseases associated with exposure to environmental pollution are caused by pneumonia and diarrheal disease. However, the emergence of more chronic diseases as a result of exposure in earlier stages of life is increasingly being observed. These chronic diseases include neuro-behavioral development disorders, asthma, hypertension, obesity, diabetes, cardiovascular diseases, and cancer. [9][10][11]

3.3. Foodborne Exposure

Food is an essential part of the human diet. However, it is also a major pathway for human exposure to hazardous chemicals found in the environment. These ubiquitous chemicals (e.g., heavy metals like mercury and lead, persistent organic pollutants, and shelf-life stabilizers like bisphenol A) can cause a range of health effects. The modern food system is becoming increasingly complex and globalized [12]. However, models for foodborne exposure either assume locally derived diets or use concentrations directly measured in foods without accounting for food origin. Such approaches would result in an overestimation of exposure for contaminants whose concentrations are high in foods grown near releases and an underestimation for diet-related chemicals whose bioaccumulation rates depend on the food type and geography.

Currently, the global food system and associated domestic foodborne exposure pathways are under heavy scrutiny of the scientific and policy community. Nevertheless, releases of industrial chemicals to ambient environment may act as a joining point between the environment and food materials. In addition to roots, crops may be exposed to airborne chemicals over their entire lifetime. However, generic foodborne exposure assessments intended to relate such releases to aggregated long-term depuration of ‘contaminants’ from the population would typically ignore chemical fate in the environment, attributing equal concentrations in food items of the same category in different parts of the world. Food processing, packaging, storage, and transportation convey thousands of chemicals from the environment to the treated product, but are not yet addressed in a scientifically transparent way in the context of foodborne exposure assessment.

4. Health Effects of Environmental Pollution

Air pollution and its adverse impact on human health cannot be overlooked. Environmental pollution is the divergence of the environment by various lethal toxic agents. Climatological changes, global warming, and wildlife extinction at a massive level are directly associated with pollution.

Air pollution is any contamination of the atmosphere that disturbs the normal composition and measurement of constituents like dust, mist, fumes, smog, and carbon from automotive source. It emerged mainly from industrial revolution and urbanization at the advent of the 19th century. Urban atmospheric pollution is a serious problem in large cities of the developing countries. The emission of acidic gases and materials due to industrial strategies and vehicular pollution can have an adverse and far-reaching impact on human health, soil fertility, vegetation, and climatology. A case study on the coroner disease deaths in Dera Ghazi Khan from 2005 to 2010 showed that 14,124 people are not well in the air quality of the urban area [13]. The data on the daily concentrations of SPM, SO2, NO2, CO, O3 and temperature showed that 1999, 9,872 people are unhealthy in terms of human health. People having unhealthy conditions have been admitted in the public hospital. The statistical data regarding the disease and the meteorological/human health data from the hospital/air pollution-hospitals were visited for information. The data on the chronic coronary diseases and major cardiovascular accidents are collected here. In these conditions it is pertinent to inform the general public of Dera Ghazi Khan about the severe condition of their environment. It is not only a problem of this single city, but

also it is a problem at the national level. In big cities a very high and increasing trend in pollution has been observed.

4.1. Respiratory System

Exposure to environmental pollution results in the exposure of the population to several inhaled toxic substances, which can cause significant damage to individuals, depending on the inhaled concentration of these substances and the disease-preventing conditions of the individual. The pollutants are classified as either primary or secondary. Primary pollutants are those emitted directly into the atmosphere and include particulate matter and gases. The secondary pollutants are chemicals that, when in the atmosphere, through chemical reactions, can be transformed into other toxic chemicals. They are luckheart that sulfur dioxide can be transformed into sulfates and nitrogen dioxide in air quality standard days in Sao Paulo City are less than 80 μg/m3. Between 80 and 100 days a year, the concentration of nitrogen dioxide exceeds these values due to the inequity of distribution of emissions between vehicles and industries, with a great volume of traffic emitting nitric oxide. Available data from Mexico City, Mexico, of the annual mean concentration of this gas in 2014 was 57 μg/m3 and 30% of the days it exceeded 126 μg/m3, which is the same that occurs in San Francisco, California [7]. In this same country, data on air concentration of sulfur dioxide from Salvador and Puebla show that both cities have means lower than 10 μg/m3, with no days exceeding 40 μg/m3, which are the same values found in Japan in Ube City. On the other hand, in China, mines and the thermal power plants result in the annual mean concentration in Taiyuan of 84 μg/m3 and in Beijing of 108 μg/m3, with the annual formulation of 216 days, these on 100 μg/m3. [14][15][16]

4.2. Cardiovascular System

Human actions, mainly environmentally unsuitable activities, have brought in energy consumption increase, depletion/destruction of natural resources, generation of energy by-product, increase in mass production and consumption, which have led to organizes in the environment because of their acceptance within intensively increased non-safety limits. At this point, environmental pollution has become an issue affecting human health in a volume that cannot be underestimated. Environmental pollution causes more than one-third of health problems, two-third of deaths, and 70% of environmentally-induced diseases that occur in developing countries. Trends show that the complex relationship between human health and environment is getting more serious. It is estimated that the number of deaths due to illnesses originating from environmental causes will increase as much as the number of deaths from tuberculosis. Anxiety in daily life, psychological calmness, and increase in the prevalence of stress are effective factors increasing the frequency of environmental pollution-based illnesses ([17]). Environmental pollution may cause a decrease in the quality of life of human beings, dryness of lakes, bloating of rivers, deforestation due to logging, dark cloud due to industries, ischemia city, and having health problems because of chronic colds. Moreover, epidemiological and clinical researches have accentuated the fact that adverse effects of environmentally existing substances over human health have thought to be shaped in a considerable manner ([18]). For this reason, the relationship between environmental pollution and health has become an important issue in consideration of regulations and researches relating to health being accelerated. However, only a few studies have investigated carefully and endeavored to minimize the deleterious consequences of the impact of other environmental factors. The aim of this study is to compile a broader scope of the association between environmental pollution and human health and to offer perspective for embodied research subjects over the forthcoming decades.

4.3. Neurological System

Ultrafine particulate matter (UFPM; <100 nm) is a significant component of the air pollutants (AP) generated by industrial and urban activities. Epidemiological studies have shown that exposure to AP increases cardiovascular mortality, the progression of atherosclerosis, the

incidence of cerebrovascular accidents, and morbidity from chronic obstructive pulmonary disease in human populations. UFPM effects are not limited to the lung but have detrimental outcomes on the cardiovascular system and eventually other organs. In fact, AP can enter circulation and distribute to various organs, including the brain. Smaller particles can access the brain directly by bypassing the blood brain barrier or through the nasal olfactory mucosa [19]. Studies on rats and mice showed that PM induces oxidative stress in the CNS and alters its immune privilege by activating microglia and astrocytes and increasing cytokine levels. PM also affects the permeability of the blood-brain barrier. PM and metal components reach the brain also when delivered intratracheally to rats. In vitro studies have shown that PM is cytotoxic also to various neuronal and glial-like cell lines and cultured rodent neurons and that toxicity is size-dependent, with smaller UFPM being better able to enter cells and exert toxic effects. A recent study provided evidence that manganese nanopolyhedra can induce cytotoxicity and mitochondrial toxicity in two dopaminergic cell lines. A follow-up study showed that manganese silicate nanosphere strings can also induce autophagy in a dopaminergic cell line. Smaller particles were more effective in increasing LC3II protein levels. Silica, titanium dioxide, and carbon black nanoparticles are also able to induce the formation of autophagic vesicles in a neuronal cell line. The toxicity of particles mainly used in combustion processes, mustards, to SH-SY5Y undifferentiated human neuroblastoma cell line was tested. The HD was the less toxic, as expected based on acute toxicity studies. In a previous study, HDS was found to be more toxic than no-tonic HDS-cipronil formulation on SH-SY5Y cell line. The formulation was used in the most of the subsequent studies because it could be assumed as more toxic than pure HD. Initial studies on the systemic apportionment of particles following inhalation exposure involved minor computational modeling to estimate the settling of particles heavier or quieter than air. Because particle deposition was a key concern in inhalation toxicology, those studies usually restricted largely to this issue. Early studies examined depositions patterns in the respiratory tract and how they are modified by particle size, shape, and aerodynamic activity. Later studies focused on real-time or near to real-time mathematical calculations estimating individual particle deposition in the human respiratory tract. Despite these efforts, still a major obstacle was a lack of quantitative deposition data for the wide size spectrum of particles present in combustion-generated emissions and for the wide range of exposure times used in the studies. In addition, there was uncertainty regarding the exposure conditions under which the reported studies were performed, and discrepancies always existed between in vivo inhalation experiments and in vitro deposition modeling. With particle deposition and related issues receiving the most attention, the mechanisms by which the particles themselves produce toxicity in the respiratory tract have usually been poorly researched. The principal toxic agent in combustion emissions was felt to be gaseous pollutants. All of these factors limited understanding mechanisms of phosgene toxicity. Early chemical kinetics studies by fire protection engineers had focused on decomposition reactions of polymers and calculated phosgene generation rates, but they say little about the chemical kinetics in the respiratory tract because these studies had optimized combustion conditions for the total release other products, not for the toxicity or presence of phosgene. More recent studies have attempted to model particle deposition in human and animal airway models but are typically limited to patients, not laboratory animals. To address much of these uncertainties, the present study attempted to integrate computational analysis with laboratory experiments using animals as surrogates for human inhalation exposure. A mathematical model was developed that was able to simulate the deposition of three different phosphorous-rich nanoparticles in the human respiratory tract following either oral or intratracheal exposures. This model was then validated with data obtained in rats and mice in a whole-body exposure chamber. Major chemical pathways of phosphorous-rich nanoparticles that were absorbed in the lung were elucidated. Mathematical modeling of phosphorous-rich nanoparticles following inhalation exposure may dramatically improve the design of new epidemiology studies. The sequencing were carried out using bulk and spectrometric techniques. Scanning electron microscopy/energy dispersive X-ray spectrometry was used to visualize the particle aggregates

and revealed that primary particles formed large aggregates. Ultraviolet–visible light spectroscopy was employed to determine accumulated dose of particles in the lung of lung–bronchoalveolar lavage exposed animals. Dynamic laser scattering analysis was used to determine the size distribution of the inhaled particles and this information was incorporated in the computational code. Multi-channel inductively coupled plasma atomic emission spectroscopy/mass spectrometry was used to determine the concentration of phosphorous in the tissues and body fluids that were collected, and it identified specific PNP in the organs/blood urine. Finally, reversed-phase high-performance liquid chromatography–inductively coupled plasma mass spectrometry was used to study long term fate of PNP and metabolic transformations of phosphorous species.

5. Vulnerable Populations

Environmental pollution is killing more people a year than smoking, war, conflict, and road traffic together. It is estimated that only 9 million were inhabitants of the same country where chemicals are banned, regulated, and substituted for safe, such as substances' goods. While developed countries are making improvements to promote better treatment of chemicals, less harmful to human health and the environment, the less regulated production and use of toxic substances affect life and health in directly. Environmental pollution has an immense impact on human health, as it has been proven scientifically. At the same time, the most affected are the populations that cannot defend themselves or cannot pay for a safer environment.

It has been proven for decades that environmental pollution has a direct impact on human health, leading to the development of many diseases and conditions, such as autoimmune diseases, cancer, and others. It was also proved that environmental pollution, primarily air pollution, has a direct impact on the development of the immune system from the first days of life. However, [20] is the first in Lithuania to investigate the association between environmental pollution and immunity. The focus of research will be on the impact of environmental contamination on immunity in two age groups of the population – on children under the age of 10 and adult residents of Lithuania from 18 to 74 years old. It is important to examine the susceptibility of the population to environmental contamination of the immune system with different age cohorts. In parallel to Lithuania, similar research on the impact of environmental pollution on human health and life will be conducted in Georgia and Ukraine, and it is planned to be carried out in Bangladesh, Nepal, and Vietnam. Gitte Verbeke, Lieutenant General, Head of the Lithuanian Department of National Environment Monitoring, under the Ministry of Environment of the Republic of Lithuania, evaluates and identities the significance of the examination of the impact of ambient air contamination on immunity. The immune system of the human body protects the body from harmful substances by responding to the influence of infectious agents and by eliminating the body's own aging or severely damaged cells.

5.1. Children

Children are not small adults, they are developing and growing, so their systems are developing and growing. Because of that, their responses to the environment differ from the responses of adults, as their physiology and behaviours change with age. They also differ in terms of the chemicals they are exposed to, the way chemicals are absorbed or metabolised and in terms of behaviour such as eating soil, sucking on objects or their hands and so on. Children are particularly apt to illnesses due to environmental exposures and the burdens of such illnesses affect them disproportionately [21]. It is estimated that 26% of the global burden of disease is related to environmental conditions, like a range of diseases, conditions which include: diarrhoea, lower respiratory infections, unintentional injuries due to unsafe water, several vector-borne diseases, including malaria, and malnutrition. Many of children's most prevalent diseases are associated with the environment. Because they have weaker immune systems and their body and organs are still developing, children are more susceptible to infections. The World Health Organization (WHO) estimates that the deaths of 1.7 million children could be prevented every

year at an estimated cost of just US $1 per child by reducing the impact of polluted indoor and outdoor environments [8]. Everywhere in the world, children's exposure to environmental threats is of great concern. How that exposure can threaten a child's health depends on certain factors: the agent involved, the dose received, duration of exposure and the child's personal or genetic predisposition. Time spent in different settings may also cause illnesses. A child's exposure profile may also change throughout life depending on how they develop and changes in behaviour. With the exception of circumstances concerning very dangerous conditions or prenatal damage, the effects of exposure have a lag time from months to many years.

5.2. Elderly Individuals

Since environmental pollution is harmful to human health, it has promoted the rise of diseases. Due to the weakening of the elderly body functions, especially for the elderly population that has already suffered from some serious diseases, once the human body inhales a large amount of dust, it is more likely to deposit in the respiratory tract and lungs, resulting in an increased incidence of respiratory diseases in the elderly population [22]. The vast majority of the elderly population has degenerative osteoarthritis, bone hyperplasia, and articular cartilage. When bone hyperplasia appears, growth causes the growth of bone to grow abnormally. Therefore, when the elderly population inhales harmful gases such as sulphur and fluorine in the environment, this part of the body is greatly stimulated and the disease becomes more serious. When the elderly populations are alone, they lack care and can only persist in the environment, so they often suffer from mental stress and their physical condition has deteriorated faster due to the environment [23]. In addition to the population and environment, there are often unhealthy lifestyles for the elderly, and the habit of not seeking medical treatment or treating diseases slowly makes the disease deteriorate again in a few decades.

For the elderly people, due to the gradual decline of the physiological function of their body tissues, the ability of resistance and immunity in the human body is obviously decreased, and they are more vulnerable to virus invasion. Therefore, the elderly population has become the most serious environmental pollution in the high-risk groups of various diseases. The nose, mouth, trachea, and throat inhaled and entered the lungs by the respiratory tract, and many diseases of the respiratory system appeared. Respiratory diseases in the elderly population have become one of the leading causes of death among the elderly population, and it is the most important part of the aging process that affects the function of the human respiratory system, making the elderly population affected by the harmful gases and microbes in the environment respiratory illnesses. Simultaneously, when the elderly populations are alone, they are under a lot of pressure and are physically weaker because of the environment. Symptoms of fever and injury aggravation occurred. At the same time, the elderly population is incompatible with other drugs, which affects the conditions of patients with various respiratory diseases.

5.3. Pregnant Women

Environmental factors have a significant impact on children’s health from the preconception period onwards and continue to affect them both during pregnancy and throughout childhood and adolescence. Among the environmental determinants, issues related to climate change and air pollution are of particular concern. Children are at a higher risk than adults, and pregnant women are at a higher risk of adverse effects as well. Since children are continuously growing, they have higher metabolic rates, their natural barriers against various environmental pollutants are not well developed, and they are more active and thus more exposed to environmental risks. In addition, children have a longer remaining lifespan, so they have a higher number of opportunities to be exposed to harmful agents. Due to these reasons, children are more vulnerable than are adults to environmental threats [24].

6. Global Perspectives

Environmental pollution is now a major cause of morbidity and mortality. Captain James Cook

in 1770 was the first to give a pollution report to the British Parliament's Royal Geographic Committee. Since then, environmental pollution and journals on it have appeared in the medical literature. In some highly polluted environments, there are reports that a newborn child might have a decreased intelligence quotient (IQ) by 1 point compared to safer environments [8]. This indicates that there may be a need to adopt community medicine as a maternal care and child speciality as far as pediatricians are concerned. It is a well-known fact that survivors of the Hiroshima bombing developed leukemia due to genetic mutations. However, no one talks about there being a possible genetic mutation in the living fetus due to heavy environmental pollution.

Exposure to toxic materials during pregnancy is an important risk factor for low IQ, attention deficit and attention deficit hyperactivity disorder, and autistic disorders. In one study, high levels of exposure of pregnant women to 3 types of persistent organic pollutants could lead to a decrease in children's IQ from 1 to 6 years of age by 3.5 points. Similarly, children born to mothers who have greater than 39 pg/ml circulation concentrations in the blood are 2.5 times more likely to develop problems of attention deficit by 8 years of age. The numbers are higher when it comes to being ADHD.

6.1. Comparison of Pollution Levels Across Countries

Background: A major emphasis in studying the overall conditions for population health in countries has been the comparative patterns of inequality that exist in morbidity and mortality patterns. This approach has origins in the applications of demographic, epidemiologic, and social science methods and the development of new models for understanding health and mortality as part of the overall process of development in countries. But to this point, the measurement of exposure and the epidemiologic analysis of the health consequences of exposures at the population level has been limited to a few causes of mortality and morbidity in only the most highly developed countries. Much of the concern has been with traditional hazards such as water and airborne disease ([8]).

The comparative patterns of environmental pollution and the diseases that it causes in different countries. The focus is narrow. The comparability of data across countries is limited by the different natures of the environment and the access to industrial and agricultural goods and technologies. But it is precisely because of these different environments that the comparison is worth undertaking. As with other forms of morbidity and mortality, the patterns of environmental exposure and disease that result vary greatly. The very sharpness of these differences can help to raise the consciousness on this important aspect of population health ([25]).

6.2. International Efforts and Agreements

Air pollution is an acute public health issue of high concern, emerges as a major topic for International Agreements, being a subject of rare attention and a geographic discussion among Parliamentarians. An increasing number of toxic minimum particles, measuring only a few micrometres in diameter, are present in the urban air where the major part of the population dwells and works [26]. These particles penetrate human lungs and blood reaching the broadest spread of human body, thereby creating a range of serious lung and heart complications. Many cities worldwide monitor daily air pollution to warn citizens about risky days, and a general agreement is expected to adopt WHO Air Quality Parameters. Multiple parameters were proposed to evaluate air and soil pollution and to compare environmental qualities among different countries. Actions to limit or prevent the introduction of dangerous chemicals into cities or towns were proposed, and underwater pollution near industrial and residential regions was recommended to avoid dangerous chemicals.

The estimation of the environmental components of integral pollution in a city was postulated to be performed for two cases: the stationary background of the ambient environment norm of living, or the average expectation background of the ambient environment norm of living. Air

and soil pollution in a biogeochemical region should consider the total number of people living in the region, and if this number is large, the biogeochemical region should be divided geographically, with separate estimation for each part. Both air and soil pollution in a city and biogeochemical region should be officially monitored annually and this service should be provided for neighbouring cities as well if the pollution sources in the city that influence air and soil pollution in neighbouring cities are the same.

7. Preventive Measures

Apart from government and global requirements, national requirements are desirable, but their implementation is not satisfactory. The undeniable fears about the consequences of an over-reliance on antibioticization, which has become a condition of all modern human life, have given a sense of urgency to this requirement. Anti-transport groups demand a reduction in the use of antibiotics, and doctors are shackled to anti-use prescription. What then? In order to understand the various aspects of this issue, as well as to film which you for personal and social behavior such as explaining patterns of sweets, as well as to look at other issues, let us first consider the social habits of Buddhist and non-Buddhist animals. They write that in percussion is a matter of habit. Everyday use of a particular road path is natural to use it again. Action becomes so close to the changing path that the grass and bushes are no longer there. It appears where wind is rising. These are the imprints of an obedient traveling practicing along the same path every day. For lack of sleeping elephants, motionless biking motion, the frightening roar of tigers, the grunting of coital prey are all highly suspicious. A standard distance that can survive between 700 years.

They study the patterns appearing in the Anatta, and describe how the Buddhist animal uluta makes noise and sleeps and goes in that direction intensifies in order to guard itself. On the other hand, a monkey ate ant skinless pies, sleepless sleeping, carnivorous anteaters, as friends and protectors, and when animals moved to a bush area near the road, birds were injured. There is a human flaw when the utsala drum sounds an unusual note. Digital noise is added to the already abstract noise of consumer speeding. The cushions heighten the mental consternation. Practice a different alternative means of protection, such as increasing the frequency of movement through obstacles, or strengthening the traps, spreading the thwart.

The National Transport Plan proposes the introduction of new discussions on health needs, extending the transition for 10 years, encouraging the development of alternatives such as multi-table transport or e-briefing, safety, and a reconsideration of lowest hit accounting for public right garbage. In psychologically informed responses to public behavior, people are often confronted with green vehicles, bypassing buses or places with poor air quality. Sensitive security management rules are required near the schools. Smog warnings about traffic lights show people running in public areas wearing air pollution masks. [27][28]

7.1. Individual Actions

Medical practitioners have an obligation to consider individual, community-based intelligence, and capacity since, given the same knowledge, what is achievable in one setting may not be so elsewhere [29]. Still, it is irrefutable that individual and group actions in the existing political, economic, and social environments can only do so much [30], and that system change is essential. Built environments, transport, and social inequalities are significant determinants of health due to their political and commercial influences. Some 35,000 are estimated to die prematurely each year in the UK due to air pollution, whilst across the world 6% of total global burden of disease is attributed to environmental health risks, notable amongst which are air pollution sources. Industrialization, urbanization, and continual expansion of a globally interlinked economic system that assumes accelerating rates of production and consumption all necessitate an increasingly unsustainable exploitation of finite resources. These physical limits confront the immensity of the un-recycled mass of energy-consuming, toxic waste-products that are thrown off. Current responses to these mega-trends appear lethargic at best. Broadly

speaking, the handling of the health dos and don'ts within the Western biomedical model appears largely predicated on separating individuals from their circumstances, and then modifying the internal biological entities. Fundamentally, the industrial growth society—with its emphasis on large-scale economic systems that politicize the disposal of waste, devolve responsibility for individuals' actions onto their conscience—and promoting a 24/7 consumer culture that saturates the environment with toxic pollutants—arguably undermines collective mental health and compromises personal ethical choices.

7.2. Community Interventions

The interventions to reduce the health impacts of air pollution can be classified in four categories: Environmental Interventions, Community Interventions, Health Care Interventions and Outreach & Advocacy Interventions . A detailed summary of Community Interventions will be presented. At the community level, there are many ways to protect the population from the health impacts of air pollution, by reducing the exposure of the population to air pollution during days when they are at increased risk or sensitive to these impacts and to extreme concentrations, e.g., during hot, sunny days with low wind speed and high photochemistry. During these days, many environmental and personal interventions are possible.

To protect the population from high concentration episodes, the following interventions may be applied: Stay indoors; Avoid strenuous physical exercises outdoors; Avoid long stays in busy streets in the city centres; Vehicle restriction; Changing work hours. To protect employees that, due to their profession, are more exposed to outdoor air pollution during days of increased risk (sports teachers in schools, traffic policemen, etc.), the following should be applied: Avoid vigorous physical exercises with the pupils during outdoor physical education classes; Avoid stopping traffic for a long time in busy streets; Wear protective mask; Limit exposure time. Finally, to protect sensitive groups of the population from the impacts of air pollution, the following measures can be applied: School transport reform; Completion of the school bus fleet and buses for social services with serviceable catalytic converters; Temporary suspension of industrial activities and quarries near schools during high pollution episodes; Reschedule outdoor school activities in case of high pollution; Urgent protection and dislocation of public green spaces in polluted parts of the city; Use free public transport for all students during high pollution episodes.

7.3. Policy and Regulation

In the new EC Commissioner mission letter of 10 September 2019, the President of the European Commission asked Stella Kyriakides, Commissioner for Health and Food Safety, to pay particular attention to air and water quality. This is in line with the Environmental Policy and Health Action Plan conducted jointly by the EC Directorate-General for the Environment and the EC Directorate-General for Health and Consumers that was adopted in 2013 and will come to an end in 2020. As adopted by EU Parliament resolution of 5 May 2015 on the Implementation of the Ambient Air Quality Directives, the EC was requested to consider revising EU air quality standards, post 2020, to align them with recommendations issued by the World Health Organization. The first Communication from the EC to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions addresses the zero-pollution ambition for a toxic-free environment of air, water, and soil.

This resolution invites the EC to revise Directive (EU) 2008/50, post the 7th Environment Action Programme, to bring it into line with the zero-pollution ambition. The pollutants in Directive (EU) 2008/50 are those measured by air quality monitoring stations particularly for a medical reading of environmental monitoring data. An "MD" entry level should provide for a disposable surgical FFP3 mask that, however, enables effective CE protection according to EN 149:2001. An automatic network will be developed to provide real-time updates to relevant practitioners on the location and density of mosquito populations in water bodies connected with malaria transmission. Given the evident escalation of climate change impacts on public health, to avoid a

public harm serious and irreversible own exposure together with the WHO recommendations both sources and environment thresholds of climate impacts should comply with the precautionary principle as foreseen by article 191 paragraph 2 in the Treaty on the Functioning of the European Union.

8. Case Studies

The intention of the public hospital authorities to establish a sustainable and effective program is necessarily conditioned by broader regulatory framework changes at the level of the health sector, and particular public hospital management. Health improvement and protection from environmental peculiarities related damages are necessary to be considered in an increased and pervasive way. But the patient-specific and overall medical environmental risks monitoring in a hospital even might be first step setting, securing and expanding a necessary protection from the related environmental damage [25]. The prominence of this damage on the working environment use, and adequate laborous conditions are obligatorily to respect the existing regulatory norms, is a potential source that warrants and might probably stimulate the examination, therapy and monitoring of the case cardiologic conditions suspected or actually induced by the work environment. Research, assessment and monitoring of potentially harmful environmental conditions those could be present for the patient in working environment should be basic step to find out the link, and to favor its legal demonstration. The most critical work environments inducing similar conditions are considered to lack of working condition diagnosis and monitoring norms, protocols and implementation and this materializes the higher level of environmental risk, by the higher probability of resisting the legal evidences that are not fulfilled the legal burden of proof.

The Department of Occupational Medicine made an examination of occupational environment conditions for a metallurgic worker who was suspected of being chronicheart ischemics, and established patient-specific recommendations for medical surveillance and labor-related conditions at work-place. The conduct is based on the following approaches: The way of the conduct and the possible presence at the work of the triggering (actually inducing pain), and of resulting (symptomatic or pathologic) conditions is widely searched. This lead to identify a) a alarm drum on the rightworking side, b) a potential following of this moment of a crane worker, guiding the crane from distant and not adequately visible points with the head and lifting a desire (heavy and voluminous) scrap backets that provoke the regular pressing and vibrations of the chest area.

8.1. Industrial Pollution in Developing Countries

Life Support Environment (LSE) and Atmospheric Revitalization: Toxicology . Exposures to harmful environmental influences, for example, in the form of leaded paint, can cause permanent changes in children, effecting significant development of the brain. There is an association between industrial pollution resulting from the production of lead-acid batteries and a high incidence of lead poisoning in children. According to a recent report, major acute diseases linked to environmental pollution in early life are pneumonia and diarrheal diseases from unsafe water and inadequate sanitation and hygiene, poor urban design, sewerage systems, and cleaning waste management [8]. Childhood exposure histories to soil and water, during earlier generations were greatly different from what has typically been experienced by, for example, today’s Chinese children. Chronic diseases of neurobehavioral development in children associated with chemical hazards (lead, an organophosphate insecticide) and air pollution, as well as contemporary disorders of neurobehavioral development, asthma, obesity, diabetes, and cancer cannot be effectively controlled by resource-poor countries. Patterns of environmental pollution, and related diseases vary greatly from country to country. Early life exposures to environmental pollutants and the associated risk of disease across the life span are explored.

8.2. Urban Pollution in Megacities

Urban pollution in megacities has an enormous impact on human health. Here, I outline some basic health problems of urban pollution, based on my experience in Brazil, and I expect this review to inspire you to start a discussion of urban pollution and health with colleagues in different cities or with researchers or health care providers.

There are a few steps to understand or control the overall health impacts of urban pollution. First of all, one must know the sources, or the development of pollution especially in gases and particulate matter. However, the evaluation of chronic health problems, such as development problems in children exposed to pollution in ombratropics countries, is extremely difficult. Hence, we suggest that scientists or health authorities install state-of-the-art measurement programs, and good reviews of the development of legislation regarding emissions to protect the environment, based especially on current knowledge on how gases and particles affect health.

9. Future Research Directions

In addition, global research on the medical impact of environmental pollution is currently fragmented and lacks a common scientific language. Although general definitions exist in the field of environmental pollution research, only very few are used in medical research. Appropriate terminology was selected and further necessary definitions developed to initiate interdisciplinary dialog and advance a concerted research effort in this important area. Adaptive computer information programs could assess individual exposure levels, identify potentially affected groups, or suggest particular diagnostic techniques or therapeutic measures even for very rare cases. Moreover, they could contribute to more effective and efficient prevention of pollution by focusing particular attention on the currently most hazardous substances [31]. In the rapidly progressing field of environmental pollution research, the complexity and variety of substances and environments are far from being sufficiently understood or defined for any generalized approach, particularly if medical aspects are observed. Therefore, possible future touchstones in various sectors of systematic exploitation, evaluation, and possibly assessment of pollution information are outlined and discussed. Special emphasis is given to problems of standardization of terminology and diagnosis. Developing highly standardized, computerized indexing systems with a broad thesaurus on environmental pollution health topics and a multidisciplinary database storage for pollution-related exposures and effects that would facilitate the generation and editing of journal abstracts (within and across disciplines) and accelerate the exchange of pollution health data in a usable format were proposed. [32]

10. Conclusion

Pollution is a phenomenon that has existed since the beginning of industrialization and urbanization, which has gained a different dimension with technological developments in the last decades, and has turned into one of the most important problems threatening the life quality of society along with the limits of natural resources. Pollution means the contamination or deterioration of air, water, or soil by the unavoidable and uncontrollable emissions of the wastes and discharge of byproducts and the spilled substances into the living environment, which depend on anthropogenic activities, and the resources become unhealthy for plants, animals, or the earth as a living thing. City air, water, and environment pollution come among the determinants of environmental pollution in terms of today's living conditions; In addition to lifestyle changes and technological developments, the increase in inorganic nutrition with wrong dietary habits constitute the reasons for the rise in the morbidity rates caused by the pollution. In this context, it is important to emphasize the responsibility of the physician in preventing disease, which is easier and cheaper to prevent than to treat, from environmental causes. The physician is employed in their field where pollution, damage occurs in the human environment and measures are needed to be taken against this damage. The teaching and control of chronic diseases are among the important duties of the physician in the environmental protection, the measures to be taken should be shown as an example in the protection of the environment. Now

that the first columns of pollution that threaten health, environmentally rapidly increasing air pollution, is stated that the rapid increase in vehicular traffic in large cities, the dispersion of industrial facilities and burning substances, both due to the air emission caused by the transformation of alveolar oxygen to irreversible nitrogen oxide reservoir is a depletion of renewable energy sources. It is emphasized that the smoke causes the least particle noise and the emission of carbon monoxide, tobacco smoke and the emission of Oryzan, and health-damaging effects on susceptible persons have been studied in many national and international studies, and it has been observed that the regulations and practices made according to the results seriously improve the quality of life. It is stated that atmospheric pollution emissions in traffic increased at a rate of 4 times faster than population growth and that improvements in the content of lead and sulphur in motor fuel and exhaust gas play a big role in elevating the level of atmospheric pollution and that new studies are needed to correct this situation. Carbon monoxide is very harmful to the lungs and it is said that nitroxine poison exposure is dangerous for health and it has been shown that it is responsible for the emergence of bronchitis and lung cancer at a high rate compared to other regions due to the formation of smoky roof fumes in urban centers characterized by intense air pollution. It is emphasized that the incidence of disease of COPD has been increased significantly by pollution of the increasing environmental effect of industrialization in parallel with urban development, even in the absence of heredity, the incidence of COPD in metropolises has been found to be 4-5 times lower in rural areas or cities with low levels of pollution. Climate is polluted, heavy metal ions, high pollution emissions, and the transformation of ozone in tobacco smoke, products, cleaners and drinking water sources proved the negative effect on health. On the other hand, it is positively stated that ozone is protective cancer against living organisms, filtering UVL radiation in the high layer of the world over the atmosphere and avoiding the emergence of eteryumus and skincancer cells. However, because the city's urban effect, the accelerating use of fuel from the time of repair of the early age skin created by environmental pollution and the formation of broncharte by the hojlamasal asthma of the alinazola synthesized led to the doubling of the number of people applying with eczema. Suicide attempts are harmful to the reasons for the use of fuel, not because of its occurrence but cause respect from the human health by associates the best early spread of the plantres itself. The importance of additional efforts is noted in order to minimize these externalities in the medium term and to improve the well-being of the population over the long term. The realization of these efforts will provide a reduction in the number of days at the edge of the bed, which will reduce the cost of treatment for these days.

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