

The Impact of Climate Change on The Mental and Physical Health in Human Being: A review

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ABSTRACT: A major worldwide concern of our day is climate change. It is regarded as a problem for both human health and the environment. Assessing the effects of climate change on humans and other living things becomes imperative. Nowadays, the vast majority of ailments are thought to be caused by the rapid environmental changes that surround individuals and particular women. In addition to physical, biochemical, genetic, and socioeconomic aspects, human mental and physical wellness need greater focus for survey and early exploration about the tendency of developing signs of certain underlying diseases and certain types of cancer as consequences of climate conditions. Thus, the purpose of this review is to record the association between Iraq's changing environment and the prevalence of various infectious diseases and malignancies.

Keywords: Climate change, infections, global warming, human health, mental health



1. INTRODUCTION

The term "climate change" describes the abrupt shift in the planet's climate. As a result of emissions and the accumulation of greenhouse gases like CO₂ and CH₄, global warming has recently become a significant issue [1]. Deforestation and the emergence of novel bacterial and viral strains that were either absent or of lower potency are two more environmental issues. In many areas of Iraq, declining water levels have resulted in a dry spell, which has restricted the total amount of water needed to meet everyday demands such as hygiene and food insecurity [2].

Thus, the answer lies in implementing quick deforestation measures, ensuring a healthy lifestyle with better air and water quality to stop the spread of infectious diseases, and maintaining human mental health [3]. The impact of climate change on human health is the most pressing issue of the twenty-first century. It is necessary to control the negative effects on the environment. For instance, Figure (1) illustrates the altered monthly average rainfall in Iraq, while Figure (2) illustrates the altered annual temperatures [4].

These changes are contributing to a drought that poses health hazards [4]. There are significant threats to one's bodily and mental health due to climate change. According to findings of [5], rising temperatures and harsh weather can cause physical health concerns such respiratory disorders, heat-related illnesses, and the aggravation of preexisting symptoms. Apart from the physical effects, climate change can have a substantial influence on mental health by exacerbating anxiety, depression, and stress. These conditions are frequently caused by the trauma of extreme weather occurrences, homelessness, or changes in employment. In order to address these two facets of health, a comprehensive strategy that combines methods for reducing negative effects on physical and mental health is needed [6].

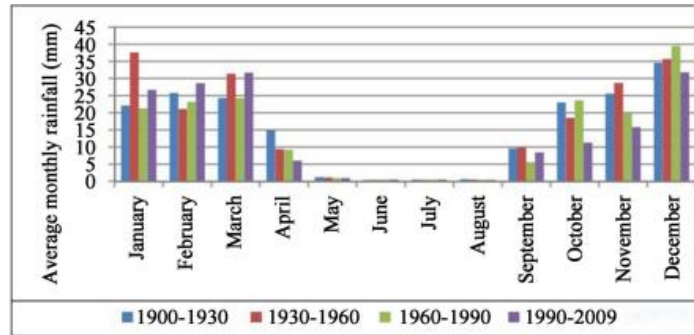


FIGURE 1. - The average of monthly rainfall in Iraq for the period (1990-2009)

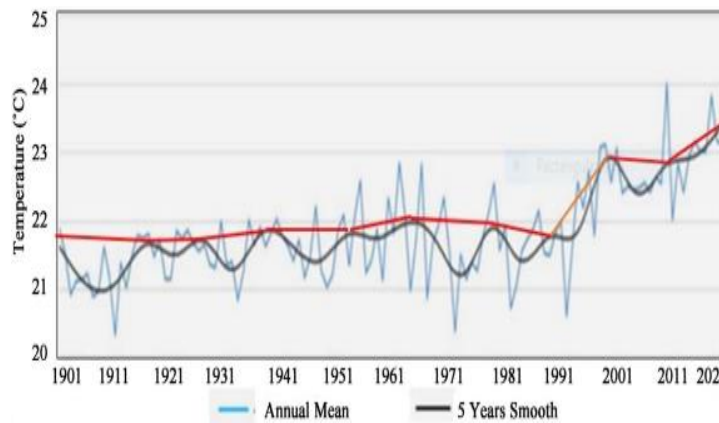


FIGURE 2. - Mean annual temperature changes in Iraq for the period (1901-2021)

These days, there is a growing trend of diseases spreading quickly and clearly [7]. The abuse of natural ecosystems and the swift nature of genetic modification in some human pathogens due to extreme climate conditions have resulted in threats in the recent past, including global warming and the massive extinction of certain living species, increasing human populations, destitution in some areas of Iraq, and the increase of pandemics like COVID-19 [8]. This review tries to show how, aside from cancer, the conditions of climate change—high temperatures, global warming, dryness, and poor water quality—relate to the prevalence of many diseases and mental health disorders.

2. CLIMATE CHANGE AND INFECTIOUS AGENTS' TRANSMISSION

Scientists anticipated in the first century of the current century that by 2020, the number of people at risk of certain diseases, such as malaria, will have increased by 60% due to climate change [9]. It has been predicted that warmer weather might also boost the transmission of other diseases, such as illnesses and fevers spread by mosquitoes [7]. This theory was based on knowledge of the main spreading agents of infectious diseases, such as ticks and mosquitoes. Inevitably Earth has warmed over the recent few decades, but the trend in the spread of infectious diseases is still unclear [9].

Therefore, knowing about the specific type of infectious disease and how it spreads to humans is essential to understanding the hyperlink between the incidence of these diseases and climate change [10]. The pathogens, which are germs that cause the infections after ingesting infected water or food, include some of the most prevalent and lethal diseases, such as malaria, typhoid fever, west Nile virus, and other microbes which range in size from extremely tiny viruses to unicellular bacteria, multicellular parasites, and fungi. Based on how the disease spread to humans, they can be split into two main categories: direct mode and indirect mode [11]. Humans may serve as the primary or exclusive host in cases where there is a direct mode of transmission, such as when a disease such as zoonosis propagates from animal to human simply due to the animals' shared bodily receptors [12]. To put it briefly, illnesses can be categorized based on their mode of transmission: direct transmission, which takes place when humans are exposed to aerosols, or indirect transmission, requiring a conduit object like insects [11, 12].

The intensity of transmission into the biosphere through several pathways, including as air, water, dust, and food, may be impacted by detrimental consequences of climate change [13]. Scientists' data indicates that the world's climate is changing more quickly than ever before. In addition to climate change, other factors that affect human health include age, gender, socioeconomic status, geography, and biology, all of which have the potential to cause disease [14]. Apart from high temperatures, higher concentrations of industrial exhaust gases might increase the pathogenicity of microorganisms and their virulence. Iraqi women over 65 are said to have high fatality rates and illnesses brought on by

heat stress. Heat exposure has an impact on older adults and is strongly associated with a higher risk of fluid shock from dryness and heart attacks. The risk of infectious diseases affecting the respiratory system can also be greatly increased by burdens related to malnutrition and family history. Together with water pollution and droughts, food and water insecurity can also positively correlate with the incidence of water-borne illnesses. Certain illnesses, such as typhoid and yellow fever, can become more common after flooding [9].

Low water source flow rates and polluted water intake are also linked to the occurrence of hepatitis and cholera. However, for elderly women and men with significant underlying medical conditions and genetic predispositions that lead to fluid imbalance in the blood, heart and kidney failure, droughts can increase the risk of cardiovascular and renal disorders [4].

According to a WHO handbook regarding Iraqi climatic changes and health for the period (2018–2022), the yearly dust storms that bring PM10 and PM2.5 aerosols to Baghdad and other regions have been identified as a major cause of suffocation among Iraqis, especially in women with asthma. In proportion to the intensity and frequency of sand and dust storms in Iraq, greenhouse gases like CO₂ and CH₄ that because global warming can bind strongly to respiratory receptors in the lungs and have severe repercussions [13]. Certain dangerous fungal species, such as grey molds and *Aspergillus*, can spread more easily under humid weather. Certain papers have even shown a correlation between humidity and high evaporation rates or rainfall. In more humid and hot weather, mycotoxins—which can spread orally and through respiratory routes—become more dangerous and can have unanticipated impacts on humans and livestock [14].

Temperature variations, industrial gas emissions, heat waves, and other extreme weather can raise death and morbidity rates, as well as cause discomfort, fast energy burn, hypersensitivity to allergens, deteriorated air and water quality, and lower human productivity [11]. Food-borne illnesses are complicated because they involve a variety of environmental pathogens that can cause diarrheal illnesses caused by bacteria, viruses, or protozoa. These infections are more common in warmer areas and can spread quickly [15].

The statistically highest monthly summer average temperature was 51.8 °C in Maysan, 51.0 °C in Di Qar, and 42.1 °C in Al-Muthanna. Other Iraqi regions showed the same trend of high temperatures, which may have an impact on the potency and productivity of numerous pathogenic agents and hazardous microbes [16]. The composition of the human microbiome can have a significant impact on immunity and the immune system's response to these pathogens, as well as hasten their spread through the air, soil, and water either directly or indirectly. In addition, some people are unable to adjust to the risks associated with climate change because those changes happen more quickly than the body can adjust [17].

3. CLIMATE CHANGE AND INFECTIOUS MENTAL HEALTH

In addition to heart attacks spurred on by blood hypertension and symptoms of depression, the monthly average temperature in Iraq suggests that it may rise above 45°C, which might make a detrimental effect on individual mental health [14]. Even if there is no family history of mental illness, there are a number of ways that disasters can lead to mental health issues [11]. This may be a consequence of an intolerance to high temperatures. The reaction may be acute or chronic, resulting in anxiety, PTSD, mental health issues, memory and visual issues, and occasionally apoplexy [5]. In addition, some persons are extremely sensitive to heat, changes in the weather, and winds, particularly women who get common migraines throughout menopause and beyond the age of 60. Due to decreased blood levels of specific hormones or the interaction of their drugs with the hyperthermia, patients with depression and schizophrenia are more vulnerable [13]. Human stress levels can increase in response to climate change depending on factors such as gender, age range, underlying diseases, family history, and economic situation [18].

4. CLIMATE CHANGE AND INCIDENCE OF CANCERS

Numerous illnesses are linked to both environmental variables and genetic predisposition. These disorders are associated with an increased risk of cancer, which may be influenced by environmental variables in addition to hereditary factors that may alter the genes that suppress cancer [19]. The incidence rates of cancer can be influenced by heat, radiation, food, and lifestyle choices. Climate conditions also affect the immune system and the tumor cells' ability to proliferate [2]. The exposure to air pollutants and harsh weather can significantly increase the risk of tumor occurrence. This is especially true for skin cancer and lung cancer, where the detrimental effects appear to be greater among the studied groups due to poor air quality and exposure to cancer-causing agents and hazardous materials, so certain malignancies can have high rates due to global warming, such as breast cancer in women, whose prevalence while growing significantly between 2009 and 2019 [19].

In addition to the high incidence of skin cancer and burns from heat and some mutagens in the biosphere, prostate cancer in men is also on the rise as heat waves occasionally strike the earth [20]. In short, the effects of climate change on women's health have led to mental health problems in addition to physical illnesses. Lung, skin, and breast cancers may be caused directly or indirectly by pollution, global warming, and drought [21].

5. RECOMMENDATION

It is advised to do more empirical research on the relationship between climate factors. Environmental technology, the prevention of infectious diseases, innovative diagnostic procedures, the validation of microbiological tests, early diagnosis through surveys, and individuals who are climate-stressed are also crucial.

6. CONCLUSIONS

The relationship between climate change and disease occurrence, especially in Iraqi women, is heavily dependent on the population's physical and mental well-being as well as general health and tolerance to heat, dryness, and the harsh effects of climate change on environmental resources like air and water. These factors are in addition to the shortage of essential services and health care facilities. In addition to the high incidence rates of cancer, climate conditions have a significant impact on human health and the biological causes of infectious diseases.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest

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