



Editorial



## Is There A Link Between Climate Change and Human Health?

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**Cite this as:** Sutrisno Sutrisno (2022) Is There A Link Between Climate Change and Human Health?. *Asian J Heal Res.* 1 (2): 1-6. doi: <https://doi.org/10.55561/ajhr.v1i2.52>

### INTRODUCTION

According to the final report of the Lancet panel on climate change [1,2], "climate change is the biggest global danger of the 21st century". The world's climate has permanently changed over time. Some regions of the Earth that are presently relatively warm were once covered in ice millions of years ago. In more recent decades, average temperatures have cycled up and down due to variations in solar radiation or the recurrent eruption of volcanoes [3]. There is broad scientific agreement that Human-caused greenhouse gas emissions are a vital contributor to global warming that is currently taking place. Global carbon dioxide emissions are rising, reaching a new high last year. Indonesians seek to fight the risk of poverty being undermined by climate change. Its effects are escalating the dangers and vulnerabilities that face the poor, adding to the strain on their already overworked coping mechanisms. Infectious diseases, malnutrition, stunting, degenerative diseases, cancer, autoimmune disease, maternal and perinatal mortality, and many more having close connection with climate change. Natural disaster to be more prevalent and aggravates the bad impact. It is need to addresses the effects of climate change on health, contemporary sociopolitical views, and the need for public health and climate change policy that places a strong emphasis on the advantages to manage climate changes in reducing health impact in Indonesia and around the world [4].

### Health Problems

Both natural occurrences and human activity have recently brought on climate change, and this trend will persist in the future. Rapid economic growth is destroying forests and burning vast amounts of coal, oil, and wood for fuel, which seriously impacts the climate. The creation of "greenhouse" gases is the main factor in the harm. This phrase is used because they have a function comparable to a greenhouse's glass roof, warming the Earth by enabling sunlight to penetrate the atmosphere while preventing some of the energy from radiating back into space. The upshot is the gradual warming of the Earth and its atmosphere. Due to land use changes and deforestation, approximately 2 million hectares per year, contributing to 85 percent of the nation's yearly greenhouse gas emissions, Indonesia is already a substantial emitter of greenhouse gases. Additionally, it is the region's major producer and consumer of coal [3].

In the past three decades, the Earth's surface has warmed by around 0.6°C, and according to climate models, this warming will continue into the twenty-first century, rising from 1.1°C to 6.4°C [5]. Rising temperatures will result in more mosquitoes (300 million more people are expected to suffer from malaria by 2080, according to simulations), heatwaves that can cause heatstroke, an increase in dengue fever, gastroenteritis, and other infectious diseases that are sensitive to the climate [6]. According to WHO estimates from 2000, higher cardiovascular disease, diarrhea,

malaria, flood injuries, and starvation due to climate changes cost 5.5 million US dollars [7]. According to their analysis, "unquantifiable" health effects are associated with violence, population displacement, weather extremes, and pollution. On the other hand, other organizations have forecast that rising temperatures will reduce crop yields by 20-40%, worsening current food shortages that have already caused hunger and the mortality of 3.5 million children and women yearly [8].

Similarly, 48 percent of people in developing countries do not have adequate access to sanitation, and 16 percent of people in these countries have limited access to safe drinking water [9]. Major weather-related catastrophes, including floods, fires, cyclones, and droughts, have recently affected more than 2 billion people [10]. Natural disasters accelerate the progress of urbanization while causing extensive environmental damage, human migration, and displacement. Urbanization may make people more susceptible to climate change, which increases population density, especially if climate resilience is not built into settlements. Climate change, lack of clean water, and declining food production systems are currently in the spotlight. These agreements jeopardize the health, stability, and existence of human populations, environmental assets, economic systems, tourism, infrastructure integrity, and iconic natural places [3]. These extreme weather occurrences have increased in frequency and severity in Indonesia during the past few years. In 2000, Indonesia had a high in natural disasters, including floods, earthquakes, and a lack of water supplies in some places. The data demonstrates how disasters have been on the rise in Indonesia annually. Obviously, Indonesia is already experiencing the effects of climate change, which may last for many generations [3].

Climate change impacts on public health in Indonesia include more severe and frequent heat floods, waves, extreme weather events, and protracted droughts, which contribute to an increase in harm, sickness, and mortality, according to WWF. There is also an increase in endemic morbidity and mortality due to diarrheal diseases, malnutrition due to disruption of food production, illness due to social upheaval and migration, increased cases of dengue fever in the rainy season, increased incidence and spread of forest fires that produce toxic chemicals such as carcinogens and dioxins. Increase in respiratory disease due to worsening air pollution and combustion [3].

### International Gaps

"The Stakeholders should protect the climate system for the benefit of coming generations of humankind, based on equity and following their common but differentiated responsibilities and respective

capabilities," according to Article 3 of the United Nations Framework Convention on Climate Change (UNFCCC) [1]. The poorest nations are most affected by climate change's health effects and have the least capacity to adapt, but developed nations produce the most greenhouse emissions. This gap is still a significant problem among the world countries and urgently needs to be solved together.

The world's population will have increased to more than 7 billion people by 2100, placing extra strain on already overburdened cities and health systems and escalating food and water shortages [11]. Most population growth is predicted to come from "high fertility" nations, largely emerging Asian and African countries. High birth rates are used to compensate for high infant mortality, a lack of social protection, and a reliance on agriculture in 'underdeveloped nations.' Modelling estimates that non-OECD nations' energy-related carbon dioxide emissions (28.2 billion metric tons) will be nearly twice as high as those in OECD countries by 2035 [12]. For developing countries to prosper economically and adapt to climate change, global carbon emissions must also be decreased. As a result, the idea of "contraction and convergence" has emerged, according to which more prosperous nations are required to reduce their emissions while enabling poorer nations to increase theirs [13].

### Problems

#### Lack of People Understanding

It appears that how individuals comprehend or perceive this phenomenon is happening depends on whether the issue of "[w]hether the planet is warming" is phrased as "climate change" or "global warming"[14,15,16]. Studies conducted in the UK indicate that most people are aware of climate change, but few people are trying to reduce their energy use [17]. On the other side, Individual justifications include criticizing others ("if the United States does not do anything, why should I?"), trust in technical solutions, or pointing to other concerns of seemingly higher importance [17,18] is still be found in many worlds resident. Individual justifications resemble those heard at the government level. These cognitive shields severely hamper the cultural climate.

The policy discussion over countermeasures to global warming is separated into two sections: mitigation and adaptation. In order to stop or even reverse climate change, mitigation refers to actions taken to lower greenhouse gas emissions. Some say that we should concentrate our efforts on reducing the causes of global warming, while others assert that it has already started and that we must find ways to adapt to its effects. Primary prevention is a crucial part of public health, but other industries, including energy and transportation,

must lead the way in developing methods to combat climate change.

The field of public health is more readily associated with adaptation. Most current measures to reduce emissions rely on institutional and economic theory [18,19]. Economic theorists believe pricing the harmful externality of carbon emissions will be necessary to rectify the market inefficiency that causes climate change. Others wish to strengthen institutions and international cooperation so they can cooperate. While combating climate change makes financial sense in the long run, people prefer to pay later, as any credit card business will tell you. As a result, these programs cannot exist in isolation.

### **Individual and Institution Response**

According to recent polls, public opinion on how seriously people view global warming is mixed. Recent natural catastrophes were viewed as confirmation of global warming by 58 percent of those polled, and 62 percent saw climate change as a "serious concern" for which "we should be leading the world in answers" [20,21,22]. Most respondents felt that a carbon price should not be implemented because there are more crucial issues to deal with [23,24].

Many nations and non-governmental organizations (NGOs) have begun to respond to climate change. The Emissions Trading Scheme [24] of the European Union went into effect in 2005. China's most recent five-year plan, which calls for a 16% decline in energy and carbon intensity as well as an 11.4 % growth in non-fossil energy use, established the goal of "gradually developing a carbon trading market"[25]. US business has typically responded when the claim presents a proposal for a required climate policy that will hurt the nation's ability to compete [26,27]. On the other hand, groups like Oxfam and the International Red Cross have made adapting to and preventing global warming from being a central part of their objectives.

### **International Political Frictions**

To get a global agreement on climate change, The 194 UNFCCC member countries that share the long-term goal of minimizing global warming have developed many policies [28]. One hundred ninety-two nations have approved the Kyoto Protocol since it was adopted in December 1997. According to the protocol's rules, 37 nations and the EU have pledged to lower greenhouse gas emissions by an average of 5% from 1990 to 2012; however, not all emitters have signed on [29]. Regrettably, international discussions have been contentious and produced only non-binding agreements since Kyoto. For the US to take action, other major polluters (China, India, Brazil, and Russia) would have to accept the same enforceable commitments, which governments did not appear to be willing to do before

the 2011 Durban meeting [30]. The Durban meeting established the "Durban Platform," a legally binding agreement among China, India, and the United States to combat global warming [31], reiterating a second Kyoto Protocol commitment period. However, the treaty's wording must be established by 2015, with implementation starting in 2020, allowing for ongoing discussion and discourse without legal sway. This concern was heightened by media reports on the recent Bonn climate conference, which suggested that the "rich-poor" divide would be reopened [32].

## **Need Urgent Action to Reduce Climate Change**

### **Short Term**

#### **Stop The Spread of Infectious Diseases**

Enhancing and implementing epidemiological surveillance systems for non-communicable diseases like malnutrition caused by climate change and communicable diseases like vector-borne disease and water-borne disease [3]. A good surveillance system will prevent the spreading of infectious diseases like Dengue fever, malaria, tuberculosis, diarrhea and others

#### **Reduced Pollution**

Cardiorespiratory health is one of the many health effects of pollution [33,34]. Over the years, the United States' Clean Air Act has significantly reduced air pollution [35]. A more approachable message may be to characterize carbon emissions as pollution [36]. The arguments of climate sceptics could be refuted by emphasizing "win-win" solutions in developed and developing nations. Reducing air pollution, which leads to millions of deaths from cardio-respiratory illnesses, would result in decommissioning coal-fired power plants [37].

#### **Legislation's Execution and Enforcement**

In Indonesia, the implementation and enforcement of the law are very lax, particularly in the field of forestry. The government needs to make policy and legislation stronger [3].

#### **Business Sector**

Building forward-thinking collaborations with businesses and industries is essential for minimizing emissions and encouraging their markets and sectors to become extremely carbon-neutral and energy-efficient [3].

#### **Establish Partnerships with Industry and Other Users to Implement Enforcement Prevention of Climate Change**

The Indonesian government collaborates with users to establish reasonable targets and implement the

program to avert climate change. The user is expected to comply, according to the authorities.

### Long Term

#### Forestation

Forests serve as a natural carbon buffer. One example of a plant that is kind to the environment is the oil palm tree. They reduce carbon dioxide levels in the air while increasing oxygen levels. Oil palm tree stands are also a renewable resource in the pulp and paper industry. The Australian project plantation created 1400 hectares of sawlog plants, which will remove over 500,000 tons of CO<sup>2</sup> over the next 30 years [3].

#### Substitution of Safe Materials and Cleaner Technology for Chlorofluorocarbons

Further study is needed to preserve the benefits of chlorofluorocarbons (CFCs) while adopting safe and clean technologies. While alternatives, such as hydrofluorocarbons (HFCs), have been created to minimize harmful effects on the ozone layer, new chemicals may have previously unknown harmful consequences. For instance, while HCFCs appear to deplete the ozone layer more slowly than CFCs, they still impact the ozone layer and can contribute to climate change [3].

#### Emission Reductions

The industrialized nations must lower their present CO<sup>2</sup> emissions, which must peak and begin to fall within the next five to eight years. The fastest, most efficient, and environmentally friendly way to cut emissions is through investing in energy efficiency at all levels, from production to actual usage. The science should create new potential for several low-emissivity technologies, including wave and tidal energy, geothermal, solar PV, hydro, bioenergy, and solar thermal [3].

#### Need Research

In order to support advocacy efforts and policy change, scientific research is essential in the field of public health. The World Health Organization is now updating its global disease burden assessment, which will now include the most recent data on the impacts of climate change on health. This will increase the need for an immediate response, but recently, there has been a paucity of quantitative data on health and climate change, with significant gaps in research on adaptation and publications from underdeveloped nations [38]. The development of policy solutions would benefit from regional health impact analyses to pinpoint climate-sensitive health outcomes, calculate the burden of climate change, and project future scenarios [39]. All need good research data related the climate change.

#### Effective Management

Adaptive management, similar to quality improvement approaches, has been considered a strategy to address climate change [40]. This strategy finds possible partners and considers how each stakeholder would understand the causes and available management options, models the consequences of alternative options, evaluates the public health intervention, and adjusts it in light of the lessons learned.

For individuals in underdeveloped countries to endure the potential risks that climate change brings, poverty reduction, improved water and sanitation, and enhanced health facilities are all important. It is essential to link climate change to the MDGs as a potential course of action.

Reduction of poverty, improved water and sanitation, and improved health facilities are all necessary for populations in developing nations to withstand the potential hazards of climate change. Millennium Development Goals as a policy option should be linked with climate change [41].

Despite the technological obstacles (such as the lack of vaccines for many infectious diseases that are sensitive to climate change, namely malaria and dengue fever), Agriculture innovation and higher food productivity are required, and the need for better green and disaster-resistant housing), numerous issues caused by climate change could be solved using resources that currently exist. Health system fragmentation must be addressed in development efforts, particularly in developing nations, to create efficient and better health systems ready for emergencies, including epidemics and pandemics. A regional and global element and suggestions from academics, medical experts, NGOs, communities, and governments are always essential to be voiced. Instead of viewing this as a problem, perhaps climate change will give the politicians the necessary credit in running their campaigns to promote the role of socioeconomic determinants of health and the future of our nation.

## CONCLUSION

Scientific data from numerous fields indicates that global warming is occurring, and its possible effects are scary. The rising temperature is closely related to infectious diseases, cardiorespiratory problems, diarrhea, flood injuries, hunger and death, food shortages, and other natural disasters.

Although there are many gaps in understanding and level of responsibilities among countries, people, NGOs and other institutions, the facts directed the need for urgent actions in the short-term and long-term programs to reduce the impacts of climate changes on human life. Spreading of infectious diseases, high maternal and perinatal mortality, epidemic and pandemic, food and



drinking water shortages, and other similar problems must be solved seriously.

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