

## UNDERSTANDING THE LINK BETWEEN CLIMATE CHANGE AND GLOBAL HEALTH SECURITY

### Background

Intergovernmental Panel on Climate Change (IPCC) defined climate change as any change in climate over time, whether due to natural variability or human activity; the body also clarifies climate change as a measurable change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. Compelling research evidence has established that climate change hazards such as drought, flooding, sea-level rise, desertification, loss of biodiversity either directly or indirectly impact human health and well-being. Different stakeholders' concerns in an environmental debate, such as United Nations Framework Convention on Climate Change (UNFCCC), World Meteorological Organization, Global Climate and Health Alliance, extensively lend their loud voice towards the devastating impact of climate change on human health its well-being.

Climate change affects vector-borne diseases by directly affecting the transmission dynamics, geographic spread, re-emergence of vector-borne disease through multiple pathways, including direct effects on pathogens, vectors, non-human hosts and humans. Emerging studies have also classified the impact of climate change on some non-communicable diseases. Breathing problems, asthma, cancer, heart disease, stroke and psychological illness are health-related challenges resulting from climate change and variability. World Health organization report has attributed illness and premature deaths due to ambient air pollution losses to \$2.1 billion in 2018 (25% of all heart diseases death, 43% of lung diseases and lung cancer death, 24% of all stroke deaths are attributed to air pollution). A study carried out by the WHO demonstrated that relatively modest warming seen between 1970 and 2004 resulted in detectable effects on human health, with an estimated 140,000 extra deaths per year attributable to climate change at this time. A more recent analysis suggests that as many as 400,000 deaths were attributable to climate change in 2010, with a significant increase in this figure expected by 2030. This alarming scenario informed WHO to declare climate change as the biggest threat to human health in the 21<sup>st</sup> century. However, if this global environmental

challenge is properly addressed, it could turn out to be 21<sup>st</sup> century most significant global health opportunity.

Consequently, the world has responded swiftly by the declaration of climate change as a “major concern to Public Health”. Addressing the impact of climate change on health requires a concerted global effort. This makes climate change important in the Global Health Security discussion. Global Health Security is the existence of strong and resilient public health systems that can prevent, detect, and respond to infectious disease threats wherever they occur in the world. This involves the proactive and reactive activities required to minimize the danger and impact of acute public health events that endanger people's health across geographic and international boundaries.

### **How Climate change Impact Global Health Security**

Climate change can alter ecosystem habitats, modulating the environment's temperature and humidity, which largely influence insects/vectors' feeding activities, reproductive success, and survival. Climate change exerts huge influence on three components essential for most infectious diseases: an agent (or pathogen), a host (or vector) and transmission environment. Appropriate climate and weather conditions are necessary for the survival, reproduction, distribution and transmission of disease pathogens, vectors, and hosts. Significant alteration in climate or weather conditions may impact infectious diseases by affecting pathogens, vectors, hosts, and living environments. Many of the most common infectious diseases, particularly those transmitted by insects, are highly sensitive to climate variation. Some insects are susceptible to temperature; for example, an increase in temperature facilitates reproductive rate and improve the feeding frequency of mosquitoes and ticks.

In addition, studies have found that long-term climate warming tends to favour the geographic expansion of several infectious diseases by creating more breeding sites for vectors required for the spread of diseases. Rising temperatures and precipitation make some regions like temperate northern hemisphere countries more susceptible to outbreaks of diseases like malaria and Lyme disease. For example, ticks do not thrive in cold and dry climates, but with the emergence of warmer and wetter climates, ticks now grow and reproduce fast in some temperate countries, thereby causing the emergence and re-emergence of Lyme disease. Nepal, which used to pride itself in being free from dengue fever because the place is too cold for the vector to survive, suffered an outbreak in 2006, with a handful of

cases. Since then, the incidence of dengue has increased significantly. Before 1970, dengue fever caused severe outbreaks in only nine countries. According to the WHO report, the disease is now endemic in over 100 countries.

Climate change is also implicated in a soaring number of lung and cardiovascular diseases, some form of cancer and mental health. Temperature rise may enhance bush fire, wildland fire, and inherent smoke exposure, which usually results in respiratory diseases like asthma, chronic obstructive pulmonary disease (COPD), and even congestive heart failure. Urbanization and migration are some of the effects of climate change that also contribute to air pollution. However, according to Intergovernmental Panel on Climate Change (IPCC), the impacts of climate change vary across regions and most importantly, the consequences are more devastating in low-income and vulnerable populations due to lack of infrastructure and technology to cope with climate change impact, dependency on nature, especially rain-fed agriculture, economic conditions, and political influence. Given all these, there is an urgent need for a paradigm shift- a change in our approach to preparing and tackling modern health challenges facing our world. We need to develop new skills, capacities and strategies to prevent, protect and promote global health security and solve emerging health challenges in the face of rising climate change. Considering the urgent need for sensitization and capacity building to effectively address biosecurity threats induced by climate change, the Global Emerging Pathogens Treatment Consortium (GET) organized a webinar in February 2022 titled“ Understanding the link between climate change and global health security”.

The webinar made a conscious campaign for a holistic approach to building a resilience environment that enhances adaptation and mitigation strategies to reduce the impact of climate change on health and well-being.

### **Recommendations:**

- i. Create awareness for target groups on the One Health approach. Considering what the world is facing now with respect to environmental devastation, there cannot be a better time to promote a multisectoral approach that describes the interconnections between human, animal, plant, and environmental health in addressing global health.

- ii. Promoting joint preparedness, surveillance and response to zoonotic diseases outbreaks. National multisectoral cooperation and preparedness are at the core of effective control of infectious diseases outbreaks through strengthened health systems and preparedness.
- iii. Strengthening laboratories' capacities to detect zoonotic diseases. The Laboratories has the potential to contribute in no small means to controlling infectious diseases outbreaks through prompt diagnosis, surveillance capacity and epidemiology studies. Competent and motivated personnel should be engaged in the laboratory's activities.
- iv. Conscious investment in multisectoral funding of One Health projects and programmes. Substantial funds should be continuously dedicated for research gaps for the most vulnerable climate change region. These regions should be equally informed and encouraged to assess the funds for research.
- v. One Health competencies should be well integrated into relevant academic disciplines and training programs.

## **About GET**

*Global Emerging Pathogens Treatment Consortium (GET) was established in 2014 as a direct response to the 2014-16 Ebola virus disease outbreak in West Africa and ongoing outbreaks of Lassa Fever, Meningitis, Multidrug resistance (MDR) enteric fevers and Yellow Fever across the sub region. There was clearly a need to create an African-led multidisciplinary forum of experts capable of working together with international partners to strengthen Africa's preparedness and resilience in tackling such infectious disease outbreaks caused by emerging pathogens, public health emergencies and pandemics.*

*GET found the understanding of biosecurity to be a very underdeveloped area on the continent with clear opportunities for using biosecurity to dramatically improve on capacity for prevention and medical countermeasures during public health crises. GET now operates firmly in the African Biosecurity and pandemic preparedness, space and functions as a think tank, providing high level advocacy and operational and necessary expertise to support Countries and communities achieve improved resources to combat outbreaks and other public health emergencies that can threaten stability, peace and security thereby undermining economic growth and well being. The consortium is working with international collaborators with a goal of providing strategic recommendations and establishing infrastructure and research capacity to respond to highly infectious emerging Pathogens such Ebola, ongoing COVID-19 Pandemic.*

*The Consortium creates a rapid informed response strategy and provides advice and guidance to African countries, and a point of reference for international funding and aid agencies.*