

CLEIMUN20

“Diplomacy in a Challenging Global Environment”

A Research Report

COMMITTEE: World Health Organization

QUESTION: The Question of Climate Change and its Effects on Current and Dormant Diseases

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Introduction and Background

The battle between humans and diseases has raged relentlessly throughout history, with diseases continuing to evolve and overcome treatment, and humans persevering to adapt and discover cures. Overall, advancements in technology and medicine have helped human society conquer over diseases. However, the same society that contributed to human flourishing, may also lead to their downfall. Many diseases have remained preserved under permafrost and glaciers for centuries. With the concern of global warming, diseases have once again become active and dangerous to human life. Diseases have been reported in the most remote parts of the world, such as Siberia and Alaska. Melting of the permafrost due to global warming has caused many locals to fall ill to these easily preventable diseases. Global warming has had an obvious effect on global health and is expected to cause more medical issues in the near future. These effects continue to have a lasting effect on human health, and they remain as a major contributor to climate change. There is not much time before a potential pandemic is unleashed upon the world.

A change must be established among nations in order to preserve the ice caps in these remote regions, and ultimately maintain a safe, global well-being.

The Current Situation of Climate Change and Diseases

In August of 2016, an anthrax outbreak was reported, of which one twelve-year-old boy and at least twenty others were infected and hospitalized. Theories state that nearly a hundred years ago, a reindeer was infected and killed due to anthrax, and the permafrost preserved the disease, placing it in dormancy for decades. Due to global warming, the soil was recently able to thaw, along with the infection. The newly released disease found its way to local food and water supplies, eventually leading to the contamination and illnesses in surrounding towns. The lack of permafrost in such isolated locations will only lead to more of these cases. These types of epidemics don't stop at anthrax. Increased rates of heat and flooding are predicted to soon lead to outbreaks of cholera, an often fatal bacterial disease found in contaminated water. High flood rates could cause the disease to spread to areas with already poor sanitation. Along with cholera and anthrax, vector-borne illnesses are also on the rise, with more cases of Zika and Lyme Disease reported. After the Zika epidemic following the 2016 Olympic Games in Rio de Janeiro, Brazil, heightened awareness of the disease was created, but Zika once again is on the rise. Zika, a devastating virus threatening children during birth typically found on mosquitos, along with Lyme Disease, a tick-borne illness causing fatigue and flu-like symptoms, poses a major threat to global health, as insects which tend to thrive in warmer climates are able to travel to new areas on the globe. These diseases, along with the threats posed by the anthrax bacterium, are of major concern, due to the rapid climate alterations worldwide. Most often, illnesses spread through

vector and water-borne transmission. Zika and Lyme disease, as vector-borne illnesses, succeed in habitats where insects can survive healthily. This requires optimal levels in various meteorological conditions, most notably precipitation and temperature, along with factors such as elevation, wind, and amount of daylight. With global increases in temperature and changes in precipitation, insects are seeking new locations to survive, thus spreading diseases such as Malaria, Zika and Lyme Disease to new areas and habitats. Water-borne diseases will typically flourish when victims come in direct contact with recreational or drinking water, or oftentimes even find their way into local food supplies. In the past, containment of sanitary water has remained primarily simple, but with advancements in global warming, contamination is a greater possibility than ever before. Melting polar ice caps have the potential to flood countless cities, having a cataclysmic effect on local food and water supplies. The contamination of such resources could cause a multitude of epidemics, while sending the earth into a global drought or famine.

Human Influence

While flooding may not help this issue, human exposure to contaminated water often results from human actions, such as improper waste disposal, or even insufficient containment from the elements. Such improper human involvement with nature could have drastic effects on global health. Poor human concern in nature doesn't cease at insufficient waste disposal or containment. Human interaction with nature has various effects on the spread of illness, both due to water contamination and vector expansion. As seen, many human relations with natural habitats, such as irrigation, urbanization, and both deforestation and reforestation all have a lasting effect on

many diseases.

Environmental changes	Example diseases	Pathway of effect
Dams, canals, irrigation	Schistosomiasis	▲ Snail host habitat, human contact
	Malaria	▲ Breeding sites for mosquitoes
	Helminthiasis	▲ Larval contact due to moist soil
Agricultural intensification	River blindness	▼ Blackfly breeding, ▼ disease
	Malaria	Crop insecticides and ▲ vector resistance
	Venezuelan haemorrhagic fever	▲ rodent abundance, contact
Urbanization, urban crowding	Cholera	▼ sanitation, hygiene; ▲ water contamination
	Dengue	Water-collecting trash, ▲ <i>Aedes aegypti</i> mosquito breeding sites
	Cutaneous leishmaniasis	▲ proximity, sandfly vectors
Deforestation and new habitation	Malaria	▲ Breeding sites and vectors, immigration of susceptible people
	Oropouche	▲ contact, breeding of vectors
	Visceral leishmaniasis	▲ contact with sandfly vectors
Reforestation	Lyme disease	▲ tick hosts, outdoor exposure
Ocean warming	Red tide	▲ Toxic algal blooms
Elevated precipitation	Rift valley fever	▲ Pools for mosquito breeding
	Hantavirus pulmonary syndrome	▲ Rodent food, habitat, abundance

▲ increase ▼ reduction

As society advances, natural preservation still remains to fall behind in human care. Lyme Disease, Malaria, Dengue fever, Cholera, Oropouche and far more unmentioned diseases have the potential to send the world into a pandemic level event. Clearly, the effect brought upon due to global warming could be potentially catastrophic. Numerous sources are believed to contribute to climate change, one major cause being changes in transmission patterns. Relationships between the causes of many diseases remain unlinked, as many pathogens carry the ability to easily adapt to certain situations, temperatures, and environments. The effect of global warming

on human health is divided into two categories: direct effect on illnesses in forms such as heat shock and worsened health in populations with other diseases, and indirect effects on diseases which help them to thrive in warmer environments. Both of these factors could have the possibility for a horrific pandemic across dozens of nations. The potential for such a terrifying situation cannot go overlooked.

Effects on International Diplomacy

While global warming directly affects the safety of world health through melting ice caps and exposing latent viruses, its effects on foreign diplomacy could be devastating. Past efforts against global warming have been made in an attempt to keep international unity, though to little avail. In December of 2015, diplomats from dozens of countries met in Paris for the United Nations Framework Convention on Climate Change (UNFCCC) to discuss possible solutions and pivotal decisions on climate change. Ultimately, their mission remained as how to keep peace within the United Nations. Climate diplomacy has remained a complicated discussion for decades, continuing to cause bitter disagreements between countries, economic interests, and debates between northern and southern countries on how to adapt and remain resilient to climate change. Although a considerable amount of evidence exists linking greenhouse gases to climate change, a collection of western countries hold persistent doubts, most likely due to their frequent industries involving greenhouse gases. However, in locations where climate change is a major issue, notably least developed countries (LDCs) and small island countries (SIDs), major leaders opposing climate change are housed in marginalized and underfunded organizations and operated by personnel who often have little negotiation skills. The balance between developed

and undeveloped nations is completely one-sided, and climate change continues to be a rising issue in all nations. In addition to the UNFCCC in Paris, over sixty years ago, states at the International Health Conference in New York helped to adopt the Constitution of the World Health Organization. Within the constitution, health is defined as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” In addition to this, the authors of the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report claim to have the right to observe that “other sectors, including ecosystems, water sanitation, and agriculture, play an important part in determining the risks of diseases and injury resulting from climate change.” Both of these claims help define how the United Nations should take many factors into account in order to preserve the best possible worldwide health. However, these publications have still sparked turmoil among states, clouding the major problems needed to be discussed by these nations. The United Nations Environmental Programme (UNEP) stressed the need to make the environment as the focus of natural resource conflicts, placing aside all gains from individual nations and focusing on the benefits for the entirety of the United Nations.

Previous Efforts

Over the past few decades, advancements in medical technology have contributed immensely to understanding these deadly diseases. Epidemiologists worldwide have dedicated years to investigate frequencies, severities, and fatalities in diseases. Due to this steady research, medical professionals have an easier time recognizing illnesses, thus able to prescribe treatment more efficiently. Simply knowing whether a disease stems from a bacterium, virus, fungus, or prion

can offer doctors better treatment for their patients. Furthermore, the advancements in vaccinations have also contributed to this ongoing battle. Vaccines have proven to be an effective method of preventative treatment against countless diseases, including rubella, polio, and even anthrax. While these do a highly effective job of preventing such terrible diseases, vaccines by themselves cannot act as sufficient treatment. All diseases have the potential to reemerge and cause catastrophic effects on a certain population. As seen in the image below, many diseases have been seen to emerge once again to to poor treatment, negligent control in food or water supplies, or even increased resistance to treatment and pharmaceuticals.

Disease	Infectious Agent	Contributing Factors
cryptosporidiosis	<i>Cryptosporidium parvum</i> (protozoa)	inadequate control in water supply; international travel; increased use of child-care facilities
diphtheria	<i>Corynebacterium diphtheriae</i> (bacterium)	interruption of immunization program due to political changes
malaria	<i>Plasmodium</i> species (protozoon)	drug resistance; favorable conditions for mosquito vector
meningitis, necrotizing fasciitis (flesh-eating disease), toxic shock syndrome, and other diseases	Group A <i>Streptococcus</i> (bacterium)	uncertain
pertussis (whooping cough)	<i>Bordetella pertussis</i> (bacterium)	refusal to vaccinate based on fears the vaccine is not safe; other possible factors: decreased vaccine efficacy or waning immunity among vaccinated adults
rabies	<i>Rhabdovirus</i> group (virus)	breakdown in public health measures; changes in land use; travel
rubeola (measles)*	<i>Morbillivirus</i> genus (virus)	failure to vaccinate; failure to receive second dose of vaccine
schistosomiasis	<i>Schistosoma</i> species (helminth)	dam construction; ecological changes favoring snail host
tuberculosis	<i>Mycobacterium tuberculosis</i> (bacterium)	antibiotic-resistant pathogens; immunocompromised populations (malnourished, HIV-infected, poverty-stricken)
yellow fever	<i>Flavivirus</i> group (virus)	insecticide resistance; urbanization; civil strife

In addition to the new discoveries scientists continue to make, efforts against climate change itself have begun to take off around the globe. Starting at the UNFCCC in 1992, 197 nations have pledged against global warming and agreed to make it a worldwide concern. In 1997, the Kyoto Protocol was launched, with 192 countries joining to reduce emissions worldwide. The Kyoto Protocol's second commitment period began in 2013, and will continue to be in action until the end of 2020. On April 22, 2016, 175 world leaders signed the Paris agreement at the UN Headquarters in New York, fighting for increased heat limits to stay under 2 degrees Celsius at all times. Since then, 184 nations have signed the Paris agreement, with notable present signatures from France, the United Kingdom, China, and the United States, although the US intends to withdraw from the agreement in November of 2020. Even with all these past efforts, more efficient resolutions must be established in order to create a safer, global health.

Possible Solutions

Climate change continues to spark unneeded political turmoil among nations whom disagree over solutions. States in which global warming has had a disastrous effect on national health don't possess sufficient funding nor experience to establish a substantial movement against climate change. Meanwhile, nations that do have sufficient resources often refuse to fund projects to stop global warming, since a considerable amount of their nation's income depends on greenhouse gases. Their focus continues to primarily be what benefits their nation directly, when the most significant issue remains on what can be done to cease the melting of permafrost and exposing of dormant diseases. Efforts in the past have been made, but the world needs a global effort to stop the spread of global warming and climate change altogether. Only a

worldwide effort can put a stop to the devastating effects of global warming and preserve the overall health for all nations.

Works Cited

“Climate Change.” *United Nations*, United Nations,
www.un.org/en/sections/issues-depth/climate-change/.

“Climate Change and Human Health - Risks and Responses. Summary.” *World Health Organization*, World Health Organization, 9 July 2009,
<https://www.who.int/globalchange/climate/summary/en/index5.html>

“Climate Change And Infectious Diseases.” *Who.int*,
www.who.int/globalchange/climate/en/chapter6.pdf.

Fox-Skelly, Jasmin. “Earth - There Are Diseases Hidden in Ice, and They Are Waking Up.” *BBC*, BBC, 4 May 2017,
www.bbc.com/earth/story/20170504-there-are-diseases-hidden-in-ice-and-they-are-waking-up.

Kurane, Ichiro. “The Effect of Global Warming on Infectious Diseases.” *Osong Public Health and Research Perspectives*, U.S. National Library of Medicine, Dec. 2010,
www.ncbi.nlm.nih.gov/pmc/articles/PMC3766891/.

Pappas, Stephanie. “5 Deadly Diseases Emerging from Global Warming.” *LiveScience*, Purch, 3 Aug. 2016, www.livescience.com/55632-deadly-diseases-emerge-from-global-warming.html.

Ununiversity. "Climate Diplomacy for Global Health." *United Nations University*,
unu.edu/publications/articles/climate-diplomacy-and-global-health.html.

(US), National Institutes of Health. "Understanding Emerging and Re-Emerging Infectious Diseases." NIH Curriculum Supplement Series [Internet]., U.S. National Library of Medicine, 1 Jan. 1970, www.ncbi.nlm.nih.gov/books/NBK20370/.

"Will Climate Adaptation Move Us toward Peace?" *Climate Diplomacy*, 21 June 2019,
www.climate-diplomacy.org/news/will-climate-adaptation-move-us-toward-peace.