Let's Make It All Simple!

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CLIMATE CHANGE AND INFECTIONS

Today, worldwide, there is an apparent increase in many infectious diseases, including some newly-circulating ones (HIV/AIDS, hantavirus, hepatitis C, SARS, etc.). This reflects the combined impacts of rapid demographic, environmental, social, technological and other changes in our ways-of-living. Climate change will also affect infectious disease occurrence as it poses a major, and largely unfamiliar, challenge.

Our increasing understanding of climate change is transforming how we view the boundaries and determinants of human health. While our personal health may seem to relate mostly to prudent behavior, heredity, occupation, local environmental exposures, and health-care access, sustained population health requires the life-supporting "services" of the biosphere. Populations of all animal species depend on supplies of food and water, freedom from excess infectious disease, and the physical safety and comfort conferred by climatic stability.

"Our increasing understanding of climate change is transforming how we view the boundaries and determinants of human health"

The world's climate system is fundamental to this life-support. The global scale of climate change differs fundamentally from the many other familiar environmental concerns that refer to localized toxicological or microbiological hazards.

Indeed, climate change signifies that, today, we are altering Earth's biophysical and ecological systems at the planetary scale – as is also evidenced by stratospheric ozone depletion, accelerating biodiversity losses, stresses on terrestrial and marine food -producing systems depletion of freshwater supplies, and the global dissemination of persistent organic pollutants.

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Weather is the continuously changing condition of the atmosphere, usually considered on a time scale that extends from minutes to weeks. Climate is the average state of the lower atmosphere, and the associated characteristics of the underlying land or water, in a particular region, usually spanning at least several years. Climate variability is the variation around the average climate, including seasonal variations and large-scale regional cycles in atmospheric and ocean circulations such as the El Niño/ Southern Oscillation (ENSO) or the North Atlantic Oscillation.

THE CLIMATE SYSTEM

Earth's climate is determined by complex interactions between the Sun, oceans, atmosphere, cryosphere, land surface and biosphere. The Sun is the principal driving force for weather and climate. The uneven heating of Earth's surface (being greater nearer the equator) causes great convection flows in both the atmosphere and oceans, and is thus a major cause of winds and ocean currents. Overall, the five layers of the atmosphere approximately halve the amount of incoming solar radiation that reaches Earth's surface. In particular, certain "greenhouse" gases, present at trace concentrations in the troposphere (including water vapor, carbon dioxide, nitrous oxide, methane, halocarbons, and ozone), absorb about 17% of the solar energy passing through it.. Of the solar energy that reaches Earth's surface, much is absorbed and reradiated as long-wave (infrared) radiation.

Some of this outgoing infrared radiation is absorbed by greenhouse gases in the lower atmosphere, which causes further warming of Earth's surface. This raises Earth's temperature by 33ºC to its present surface average of 15ºC. This supplementary warming process is called "The Greenhouse Effect"

Frequently asked questions about climate change and health linkages:

1.What could be the consequences of Climate on health?

Although global warming may bring some localized benefits, such as fewer winter deaths in temperate climates and increased food production in certain areas, the overall health effects of a changing climate are overwhelmingly negative. Climate change affects many of the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter.

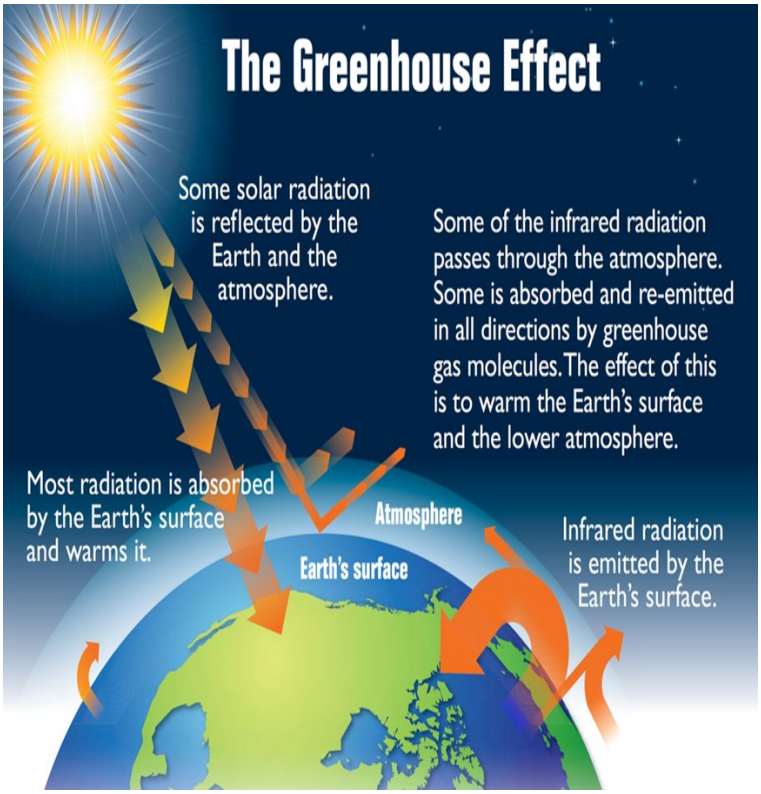

FIG: The Greenhouse Effect

2.What are Carbon Emissions?

The greenhouse gases being released by human activity are often called "carbon emissions. That is because the two most important of the gases, carbon dioxide and methane, contain carbon. Many other gases also trap heat near the Earth's surface, and many human activities cause the release of such gases to the atmosphere. By far the biggest factor causing global warming is the burning of fossil fuels for electricity and transportation. That process takes carbon that has been underground for millions of years and moves it into the atmosphere, as carbon dioxide, where it will influence climate for many centuries into the future.

3.How does Climatic affect Food Quality and Safety?

Higher air temperatures can increase cases of *Salmonella* and other bacteria-related food poisoning because bacteria grow more rapidly in warm environments. These diseases can cause gastrointestinal distress and, in severe cases, death. Practices to safeguard food can help avoid these illnesses even as the climate changes. Climate change will have a variety of impacts that may increase the risk of exposure to chemical contaminants in food. For example, higher sea surface temperatures will lead to higher mercury concentrations in sea-food, and increases in extreme weather events will introduce contaminants into the food chain through storm water runoff.

Fig 11.1. Relationships between vulnerability and impacts (including both risks and opportunities) and society's main response options – i.e., mitigation of greenhouse gas emissions and adaptation (Source: reference 1)

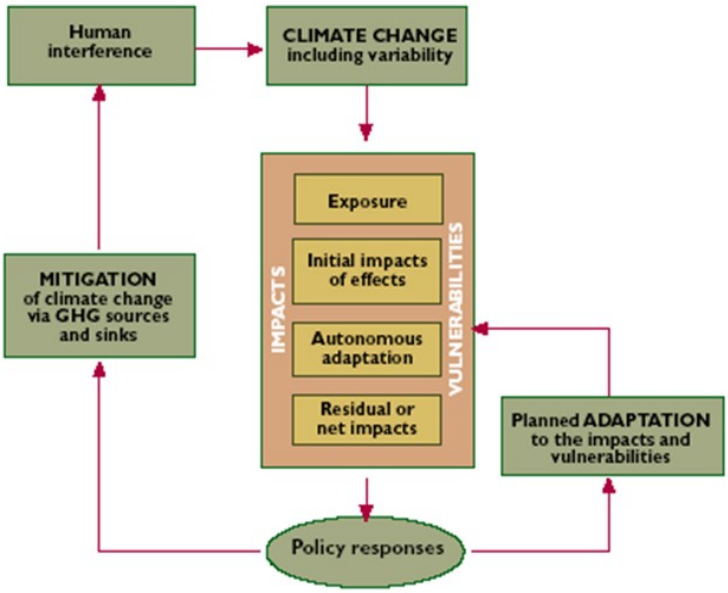

Image Source: www.who.int

Higher concentrations of carbon dioxide in the air can act as a "fertilizer" for some plants, but lowers the levels of protein and essential minerals in crops such as wheat, rice, and potatoes, making these foods less nutritious. Extreme events, such as flooding and drought, create challenges for food distribution if roads and waterways are damaged or made inaccessible.

4.How can we protect the population from climatic impacts?

Even if greenhouse gas emissions are reduced in the near future, Earth's climate will continue to change. Hence, adaptation strategies must be considered to reduce disease burdens, injuries, disabilities and deaths. Many adaptive measures have benefits beyond those associated with climate change. The rebuilding and maintaining of public health infrastructure is often viewed as the "most important, cost-effective and urgently needed" adaptation strategy. This includes public health training, more effective surveillance and emergency response systems, and sustainable prevention and control programs. Adaptations which enhance a population's coping ability may protect against current climatic variability as well as against future climatic changes. Such "no-regrets" adaptations may be especially important for less developed countries with little current coping capacity.

5.How does the Green Revolution contribute to climate change?

Agriculture has undergone a "green revolution" over the past 50 years, with more and more crops being produced from an acre of land than ever before. That agricultural revolution could be changing concentrations of carbon dioxide in the atmosphere, and possibly having a small effect on climate change. Just as forests are often said to be the lungs of the earth, the same is true for crops. During the growing season, forests absorb CO2 from the atmosphere and release it when leaves fall to the ground and decompose in the fall. Likewise, when corn sprouts and grows into mature cob-laden stalk, it absorbs carbon dioxide from the atmosphere, and releases it — exhaling — when it withers, dies and decomposes. Such agricultural inhaling and exhaling of CO2 contributes to seasonal changes in the global carbon cycle.

6.What does climate change have to do with spreading disease?

Rising global temperatures exacerbate heat-related diseases such as heat exhaustion, heatstroke, and cardiovascular, respiratory, and kidney diseases. On average, extreme heat kills more Americans every year than floods, hurricanes, lightning, and tornadoes taken together. Climate change also has a strong impact on food-borne and water-borne diseases, which thrive in warmer, wetter conditions, as well as diseases carried by insects, snails, and other cold-blooded animals, whose ranges are extended by climatic shifts. As the world becomes warmer and wetter due to climate change, diseases that thrive in these conditions (such as malaria) will spread, sickening and killing more people each year.

Coming up next:
"Greater The Screen Time, Lesser The Eyesight"

7.Is There anything we can do about Climate Change?

Changes in the way you live your life - both big and small - can help you reduce your own personal carbon footprint, and also encourage policy makers to act for the good of the planet. Below is a list of some easy things you can do right now to help fight climate change.

1. Switch to 100% green power
2. Save energy
3. Optimize your diet
4. Avoid plastic wherever you can.
5. Sharing is caring!
6. Shrink your digital footprint
7. Make sustainable investments
8. Get on your bicycle!
9. Protect our forests and plant more trees
10. Make informed decisions as a consumer and as a citizen
11. Go out on the street and make your voice

Sources for this blog:

- en.reset.org
- intcce.org
- eesi.org
- www.who.int
- nytimes.com

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