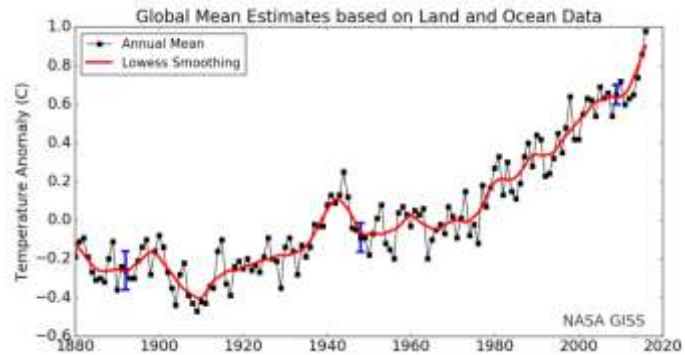


Dr S. Z. Qasim Oration organized by NESAI, New Delhi at Jamia Hamdard on 4th July 2019



Dr. (Mrs) Malti Goel, Former Adviser & Emeritus Scientist, Government of India, New Delhi

Global Warming and Climate Change



Heat waves and draughts



Extreme weather events



Tropical Cyclones



Health

Weather-related mortality
Infectious diseases
Air-quality respiratory illnesses



Temperature



Forests

Forest composition
Geographic range
Forest health and productivity
Wildfires



Precipitation



Sea Level Rise

IMPACTS ON...



Species and Natural Areas

Loss of habitat and species
Cryosphere:
diminishing glaciers



Coastal Areas

Erosion of beaches
Inundation of coastal lands
Additional costs to protect coastal communities



Water Resources

Water supply
Water quality
Competition for water



Agriculture

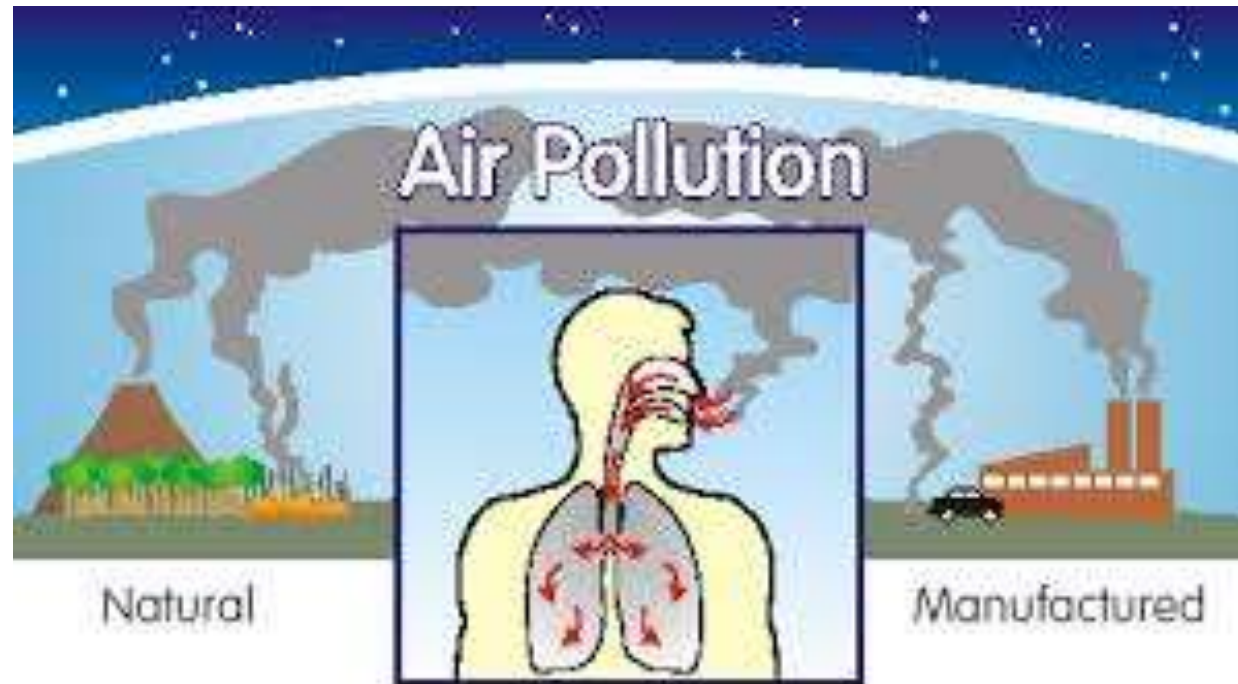
Crop yields
Irrigation demands

Health Impacts of Extreme Weather Events

- **Air Quality Impacts:** Pollution in the air affects mortality and morbidity due to respiratory, cardiovascular and circulatory diseases. In 2010, more than 7% of the global burden of disease was due to inhalation of various air pollutants.
- **Heat Waves:** Affect more the vulnerable population giving rise to increased mortality.
- **Vector-Borne Diseases:** Climate Change is giving rise to birth of new pests and viruses, resulting in dengue, swine flu, Chickengunya and others.
- **Food and Water-Borne Diseases:** Events such as floods, give rise to water borne climate-dependent infectious diseases like typhoid, cholera etc. Drought affects crop yield and shift in cropping patterns affecting peak infection rate, malnutrition etc.
- **Mental Health:** Incidences of aggravation of mental health problems are seen.

Air Quality Impacts

- Fine particulate matter change in response to climate change.
- Increased Ozone causes direct, reversible lung injury and is associated with acute myocardial infarction
- Increased burden of PM2.5 is associated with respiratory diseases, cardiovascular disease, as well as ischemic heart disease



Heat Waves

- **Heat cramps** – muscular pains and spasms
- **Heat exhaustion** – body fluids are lost through heavy sweating
- **Heat stroke** – Stroke incidences increase with increasing temperature can be life threatening
- **Direct** impact is more among young children and older population
- **Indirect** impacts are on ecosystem, water, food, disease-carrying vectors, lifestyle, community resilience, job losses



Vector Borne Diseases

Vectors and Vector borne disease



Disease	Causative agents	Vectors	Methods of infections
Malaria (commonest)	Plasmodium	Anopheles mosquitoes	Bite
Dengue fever	Virus	Aedes mosquitoes	Bite
Encephalitis	Virus	Culex mosquitoes	Bite
African sleeping sickness	trypanosomas	Tse tse fly	Bite
Dysentery (amoebic)	Protozoan	Housefly	Contamination of food
Dysentery (bacillary)	Bacterium shigella sp.	Housefly	Contamination of food
Cholera	Vibrio cholerae	Housefly	Contamination of food

Foodborne and Waterborne Infections

Foodborne infections

Any disease that can be acquired:

- By eating food contaminated with a pathogen.
- By getting the pathogen into the digestive system through dirty hands or surfaces.

Waterborne infections

Any disease that can be acquired:

- By drinking water contaminated with a pathogen.
- By getting water into your mouth during recreational sports such as: fishing, swimming, or boating,...
- By letting contaminated water come into contact with open areas on the skin.

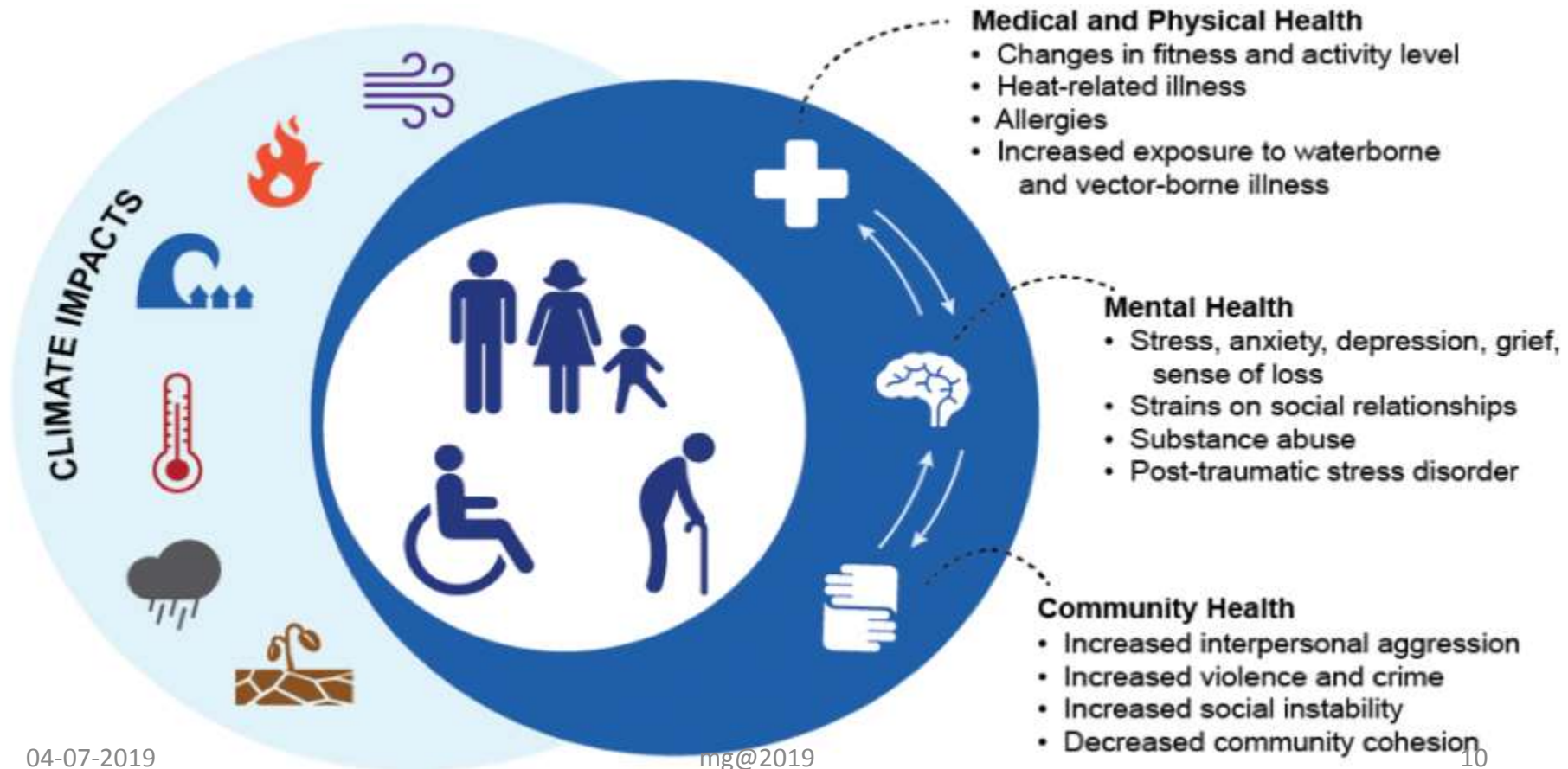
Food and Water borne Diseases

- Seafood borne diseases associated with *Vibrio* infection, *V. vulnificus* & *V. parahaemolyticus*
- More virulent strains of existing pathogens & emergence of new pathogens due to ocean acidification
- Contaminants runoff - leaching of arsenic, fluoride, and nitrates from fertilizers and other chemical contaminants
- Effect of Droughts on crops and increase in crop pests such as aphids, locusts, and whiteflies, as well as the spread of the *mould Aspergillus flavus*
- Effect on Agricultural crops due to droughts and floods compromise food security and can cause *Malnutrition*



Climate Change and Mental Health

Extreme events and violent weather causes Stress and Anxiety , Depression and Distress, Post traumatic stress disorders especially among the aged



EXPOSURE

Exposure is contact between a person and one or more biological, psychosocial, chemical, or physical stressors, including stressors affected by climate change.

SENSITIVITY

Sensitivity is the degree to which people or communities are affected, either adversely or beneficially, by their exposure to climate variability or change.

ABILITY TO ADAPT

Adaptive capacity is the ability of communities, institutions, or people to adjust to potential hazards such as climate change, to take advantage of opportunities, or to respond to consequences.



VULNERABILITY of Human Health to Climate Change



HEALTH OUTCOMES

Injury, acute and chronic illness (including mental health and stress-related illness), developmental issues, and death.

Scientific Assessment of Health Risks

The health risks arise from the interactions of three factors:

- (1) How climate change will alter the ecosystem that support mosquito populations;
- (2) Who is exposed most to these changing weather patterns; and
- (3) The underlying vulnerability of the exposed populations.

Scientific Assessment are needed for improving air, water quality and in finding solutions for minimizing the adverse impacts on human health and preventing diseases.

Future rate of health impacts = **Baseline health status** x **Expected changes in exposure** x **Response function of population.**

WHETHER YOU LIVE IN A...



CLIMATE CHANGE THREATENS YOUR HEALTH

Drought, floods and heat waves will increase.



Vector-borne diseases, like malaria and dengue virus will increase with more humidity and heat.

Basic necessities will be disrupted...



FOOD

Hunger and famine will increase as food production is destabilised by drought.



AIR

Pollution and pollen seasons will increase leading to more allergies and asthma.



WATER

Warmer waters and flooding will increase exposures to diseases in drinking and recreational waters.

Between 2030 and 2050 climate change is expected to cause
250 000 ADDITIONAL DEATHS PER YEAR
due to malaria, malnutrition, diarrhoea and heat stress.



World Health Organization

What you can do?

- ❖ **Mitigate climate change**
- ❖ **Develop scientific Assessment of health risks**
- ❖ **Develop Resilience in the immune system**
- ❖ **Prevention is better than cure**
- ❖ **Take corrective measures;**

I. Avoid going out when pollution is high

II. Keep the doors and windows tightly closed

III. If you have to go out, then

- Cover your nose and mouth with handkerchief
- Use Mask (N95)
- Avoid traffic congested areas

Climate Change induced health concerns require more efforts to address many different persistent and emerging health issues. The indicators at the intersection between the environment and health should be identified for corrective action.

Thank You

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