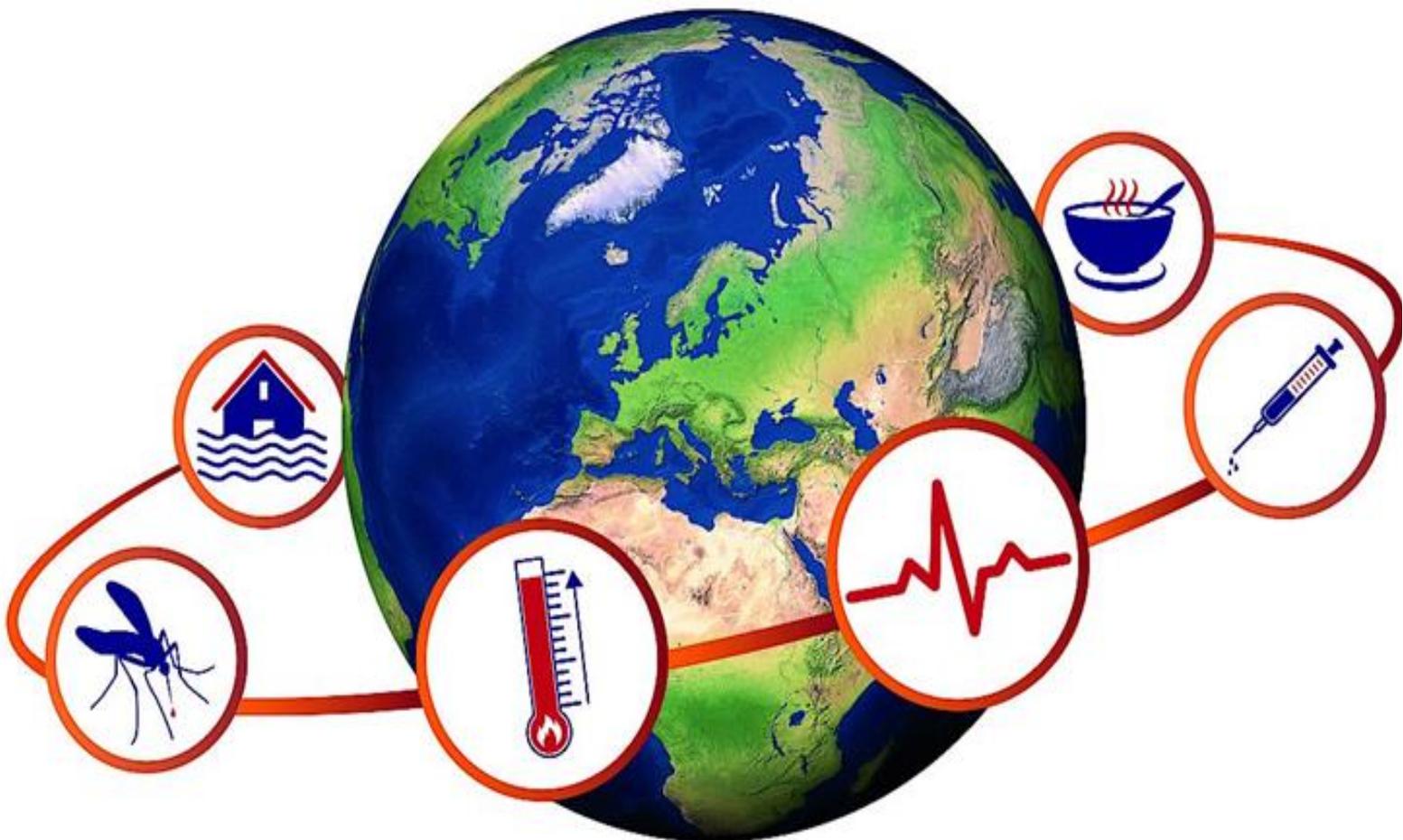




CLIMATE CHANGE & HEALTH FOR PRIMARY STUDENTS VOL. 6





CLIMATE CHANGE AND HEALTH FOR PRIMARY STUDENTS



NOTE:

The purpose of this booklet is to enhance knowledge on Climate Change and Health for students from Grades 4-6. The material relies heavily on content from Centre for Disease Control.gov

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Climate Change and Health

What is Climate Change?

Climate change is one of the most important issues facing the planet today. Most of us would have learnt that the climate worldwide is currently changing and that the last two decades have been the warmest period in the entire global temperature record. (*See Volume 3 for more details*).

What are the impacts of climate change on health?

The impacts of climate change include warming temperatures, changes in precipitation, increases in the frequency or intensity of some extreme weather events, and rising sea levels. These impacts threaten our health by affecting the food we eat, the water we drink, the air we breathe, and the weather we experience.

Air Pollution

Climate change is projected to harm human health by increasing ground-level ozone and/or particulate matter air pollution in some locations. Ground-level ozone (a key component of smog) is associated with many health problems, such as diminished lung function, increased hospital admissions and emergency room visits for asthma, and increases in premature deaths.

Factors that affect ozone formation include heat, concentrations of precursor chemicals, and methane emissions. Particulate matter concentrations are affected by wildfire emissions and air stagnation episodes, among other factors. By increasing these different factors, climate change is projected to lead to increased concentrations of ozone and particulate matter in some regions. Increases in global temperatures could cause associated increases in premature deaths related to worsened ozone and particle pollution.



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Wildfires

Climate change is increasing the vulnerability of many forests to wildfires and is also projected to increase the frequency of wildfires in many countries around the world. Long periods of record high temperatures are associated with droughts that contribute to dry conditions and drive wildfires in some areas. Wildfire smoke contains particulate matter, carbon monoxide, nitrogen oxides, and various volatile organic compounds (which are ozone precursors) and can significantly reduce air quality, both locally and in areas downwind of fires.

Smoke exposure increases respiratory and cardiovascular hospitalizations; emergency department visits; medication dispensations for asthma, bronchitis, chest pain, chronic obstructive pulmonary disease (commonly known by its acronym, COPD), and respiratory infections; and medical visits for lung illnesses. It has also been associated with hundreds of thousands of deaths annually, based on an assessment of the global health risks from landscape fire smoke. Climate change is projected to increase wildfire risks and associated emissions, with harmful impacts on health.



Extreme heat

Extreme high air temperatures contribute directly to deaths from cardiovascular and respiratory disease, particularly among elderly people. In the heat wave of summer 2003 in Europe for example, more than 70 000 excess deaths were recorded. High temperatures also raise the levels of ozone and other pollutants in the air that exacerbate cardiovascular and respiratory disease.

Pollen and other aeroallergen levels are also higher in extreme heat. These can trigger asthma, which affects around 300 million people. Ongoing temperature increases are expected to aggravate this burden.



Food and Waterborne Diarrheal Disease

Exposure to a variety of pathogens in water and food causes diarrheal disease. Air and water temperatures, precipitation patterns, extreme rainfall events, and seasonal variations are all known to affect disease transmission. In general, diarrheal diseases, including foodborne illnesses, are more common when temperatures are higher, though patterns differ by place and pathogen. Diarrheal diseases have also been found to occur more frequently in conjunction with both unusually high and low precipitation.



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Food Security

Globally, climate change is expected to threaten food production and certain aspects of food quality, as well as food prices and distribution systems. Many crop yields are predicted to decline because of the combined effects of changes in rainfall, severe weather events, and increasing competition from weeds and pests on crop plants. Livestock and fish production are also projected to decline.



Mental Health and Stress-Related Disorders

Extreme weather events can affect mental health in several ways. Following disasters, mental health problems increase, both among people with no history of mental illness, and those at risk – a phenomenon known as “common reactions to abnormal events.” These reactions may be short-lived or, in some cases, long-lasting.

In addition, some patients with mental illness are especially susceptible to heat. Suicide rates vary with weather, rising with high temperatures, suggesting potential impacts from climate change on depression and other mental illnesses. Additional potential mental health impacts, include the possible distress associated with environmental degradation and displacement and the anxiety and despair that knowledge of climate change might cause in some people.



Diseases Carried by Vectors

Climate is one of the factors that influence the distribution of diseases borne by vectors (such as fleas, ticks, and mosquitoes, which spread pathogens that cause illness). The geographic and seasonal distribution of vector populations, and the diseases they can carry, depends not only on climate but also on land use, socioeconomic and cultural factors, pest control, access to health care, and human responses to disease risk, among other factors. Daily, seasonal, or year-to-year climate variability can sometimes result in vector/pathogen adaptation and shifts or expansions in their geographic ranges.

Infectious disease transmission is sensitive to local, small-scale differences in weather, human modification of the landscape, the diversity of animal hosts, and human behavior that affects vector-human contact, among other factors.



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Allergens

Climate change may affect allergies and respiratory health. Climate change, resulting in warmer seasonal air temperatures, can contribute to shifts in flowering time and pollen initiation from allergenic plant species. Increased CO₂ by itself can elevate production of plant-based allergens. Higher pollen concentrations and longer pollen seasons can increase allergic sensitizations and asthma episodes and diminish productive work and school days. Simultaneous exposure to toxic air pollutants can worsen allergic responses.



Natural disasters and variable rainfall patterns

Globally, the number of reported weather-related natural disasters has more than tripled since the 1960s. Every year, these disasters result in over 60 000 deaths, mainly in developing countries.

Rising sea levels and increasingly extreme weather events will destroy homes, medical facilities, and other essential services. More than half of the world's population lives within 60 km of the sea. People may be forced to move, which in turn heightens the risk of a range of health effects, from mental disorders to communicable diseases.

Increasingly variable rainfall patterns are likely to affect the supply of fresh water. A lack of safe water can compromise hygiene and increase the risk of diarrheal disease, which kills over 500 000 children aged under 5 years, every year. In extreme cases, water scarcity leads to drought and famine. By the late 21st century, climate change is likely to increase the frequency and intensity of drought at regional and global scale.

Floods and extreme precipitation are also increasing in frequency and intensity. Floods contaminate freshwater supplies, heighten the risk of water-borne diseases, and create breeding grounds for disease-carrying insects such as mosquitoes. They also cause drownings and physical injuries, damage homes and disrupt the supply of medical and health services.

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Rising temperatures and variable precipitation are likely to decrease the production of staple foods in many of the poorest regions. This will increase the prevalence of malnutrition and undernutrition, which currently cause 3.1 million deaths every year.

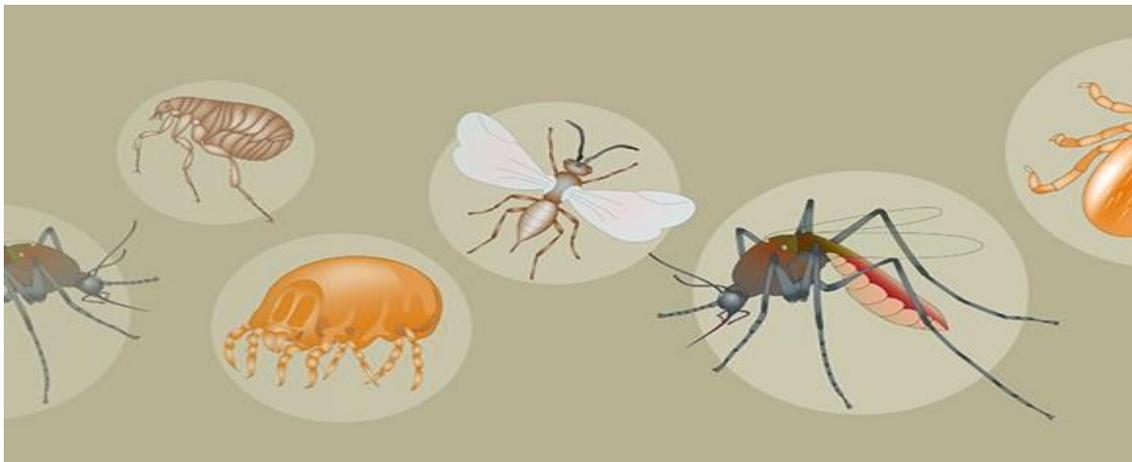


Patterns of infection

Climatic conditions strongly affect water-borne diseases and diseases transmitted through insects, snails, or other cold-blooded animals.

Changes in climate are likely to lengthen the transmission seasons of important vector-borne diseases and to alter their geographic range.

Malaria is strongly influenced by climate. Transmitted by Anopheles mosquitoes, malaria kills over 400 000 people every year – mainly children under 5 years old in certain African countries. The Aedes mosquito vector of dengue is also extremely sensitive to climate conditions, and studies suggest that climate change is likely to continue to increase exposure to dengue.



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Who is at risk?

All populations will be affected by climate change, but some are more vulnerable than others. People living in small island developing states and other coastal regions, megacities, and mountainous and polar regions are particularly vulnerable.

Children – in particular, children living in poor countries – are among the most vulnerable to the resulting health risks and will be exposed longer to the health consequences. The health effects are also expected to be more severe for elderly people and people with infirmities or pre-existing medical conditions.

Areas with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond.



Key facts

- Climate change affects the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter.
- Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress.
- The direct damage costs to health (i.e. excluding costs in health-determining sectors such as agriculture and water and sanitation), is estimated to be between USD 2-4 billion/year by 2030.
- Areas with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond.
- Reducing emissions of greenhouse gases through better transport, food and energy-use choices can result in improved health, particularly through reduced air pollution.



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