

Climate Change and Dengue

Climate change has wide ranging consequences for human health. Public health depends on sufficient food, safe drinking water, secure shelter, good social conditions and a suitable environment for controlling infectious diseases. All of these factors can be affected by climate.

Heat waves, flooding, storms and drought can cause deaths and injuries, famine, the displacement of populations, disease outbreaks and psychological disorders. Higher temperatures also alter the geographical distribution of species that transmit disease. For example, outbreaks of dengue and yellow fever, transmitted by mosquitoes, increase in warmer temperatures.

“We may not be able to change the state of the weather, but certainly we can prepare for, and adapt to it.” This is the view of Dr. Anthony Chen, Dr. Samuel Rawlins and Dr. Dave Chadee, the editors of the publication, “Climate Change Impact on Dengue: The Caribbean Experience”.

The dengue study is one of 24 case studies that was executed under the project Assessments of Impacts and Adaptations to Climate Change (AIACC). The AIACC project was launched in 2001 in response to needs for advancing climate change research and research capacity in those developing countries that were highlighted by scientists participating in the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

According to the editors, the impetus for research into Climate Change and Dengue in the Caribbean Region was initiated because of the recent increases in the incidence of Dengue Fever (DF) and the temperature increases expected from climate change.

Studies have revealed that the occurrence of DF is sensitive to factors such as temperature increases and rainfall. Therefore the IPCC's projected long-term changes in climate should be a source of concern for us all.

The primary vector responsible for DF transmission is the *Aedes aegypti* mosquito which is of African origin. During the African slave trade, *Ae. aegypti* mosquitoes rapidly adapted to domestic habitats in sailing vessels, frequently breeding in the ship's water storage containers, which led to the dissemination of both the DF virus and *Ae. Aegypti* in many port cities in the New World.

Although DF outbreaks are multifactorial - involving social, biological and environmental factors, such as poor sanitation or water retaining receptacles such as discarded water containers and tyres - climatic factors also play a significant role.

For example, during the El Niño years in the Caribbean, drier than normal conditions with increases in air temperatures occur, leading to the need for domestic water storage. These ideal conditions provide suitable breeding grounds for the mosquito and for the increase of DF. Of course, rainfall just has to be sufficient to maintain appropriate larval habitats and prevent the drying out of discarded containers to maintain and continue the disease cycle of transmission.

Reports from the IPCC, also state that although socio-economic factors must also be considered, the sharp rise in the incidence of DF from 1991 onwards, may be related to increases in minimum temperatures. For example, the Caribbean islands experienced an increase in mean annual temperature of more than 0.5°C during the period 1900-1955.

Throughout the Caribbean region the management of Dengue Fever and its vector, the mosquito *Ae. Aegypti*, was based mainly on the chemical approach, with a small component involving environmental sanitation by the participation of the community and the public health authorities. But if the community does not cooperate with the public health planners, the execution of vector management programmes will not be entirely successful.

While some communities benefit from intensive dengue fever control programmes, they eventually view vector control primarily as the responsibility of the government.

However, since environmental sanitation for vector control is important and necessary at the domestic level, there is a significant role for the individual and the community as a whole to play.

Knowledge, attitudes and practice regarding dengue fever and its control are essential to health planners and the community in the fight against dengue fever.

In the wake of 12 Chinese workers having been infected with the vector-borne disease, dengue fever, Chief Medical Officer Dr. Rohit Doon issued a dengue fever update last week. In the alert, Doon said that while the Port of Spain City Corporation has begun spraying, the public should also take precautions as the risk factors of the dengue fever transmission are associated with the epidemiological triad – the vector, the presence of the virus and susceptible hosts. In light of the increase in dengue fever in Latin America and the Caribbean Region, the Ministry of Health is seeking to initiate a Dengue Task Force to develop a National joint Action Plan for the control and prevention of Dengue Fever.



The *Aedes aegypti* mosquito, carrier of the vector-borne disease, dengue fever.

Courtesy the Environmental Management Authority

