**Climate change and Vector Borne diseases**

**Dr. Andrew K. Githeko**  
agitheko@kisian.mumcom.net

The major vector borne diseases are transmitted by mosquitoes and ticks. Malaria is the most climate-sensitive VBD while dengue fever appears to be less sensitive. Rift valley Fever which mainly occurs in warm areas of Africa and Middle East is more sensitive to flooding. Lyme disease which is mainly prevalent in Europe and North America has been associated with warmer weather and so has been tick-borne encephalitis (TBE) in Europe.

The Third Assessment Report (TAR) of the Inter-governmental Panel on Climate Change (IPCC) concluded that at the current rate of increase in green-house gases, the global average temperatures are likely to increase by 1.4 and 5.8°C during this century. These changes will affect climate sensitive VBD.

Evidence of association between VBD and climate change and variability is based in altitudinal and latitudinal increase in disease incidence.

Little evidence has been documented in altitudinal increases in malaria distribution. However increases in the frequency of epidemics in the highlands of Eastern Africa since the 1980’s have been recorded and these can be treated as cyclic transient changes. The temporal and spatial distribution of the epidemics is consistent with climate variability in the region. From fundamentals of biology, climate modulates malaria transmission while interventions control morbidity and mortality. In Africa, 15.5% of the population (124 million) is at risk from epidemic malaria.

Studies in Thailand have established that there is a significant complex, non-linear association between El Nino, climate variables and dengue fever and dengue haemorrhagic fever (DHF). Studies in the Caribbean Islands have also found association between dengue fever and El Nino like weather. Dengue is the leading viral VBD putting 2.5 billion people at risk.

Changes in the latitudinal spread and abundance of Lyme disease vectors in relationship to milder winters have been well documented in Sweden. In the United States disease incidence has been correlated to wetter conditions in the period preceding the outbreaks.

In Sweden tick-borne encephalitis which has increased since the mid-1980s may have been caused by milder climate in this period which has permitted ticks to have become more abundant.