Influence of climate change on malaria occurrence in North Central Nigeria

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Abstract

Malaria is a preventable, treatable and life threatening infectious disease transmitted by bites of female anopheles mosquitoes. The prevalence of malaria may not be due to human ecological factors alone but also to some extent climatic predictors which have been associated with the occurrence of vector borne diseases. The main objective of this study is to examine the complex relationship between meteorological variables and malaria occurrence in Nigeria. Data on reported and diagnosed malaria cases in Nigeria for the period between 1997 and 2014 were used in this study. Rainfall, temperature and relative humidity exhibited various levels of influence on reported cases as they were significance predictors. The results show more reported and diagnosed cases of malaria in the months of June, July and August which are the months of peak rainfall. Monthly correlation analysis indicated an inverse relationship between malaria occurrence and rainfall in dry season while the reverse is true for the rainy season. An increase in monthly temperature increases the number of malaria cases in the months of April to July while an inverse relation was observed in the remaining months of the year. Relative humidity displayed an inverse relationship at the commencement and ending of the rainy season. Negative binomial GLM revealed every unit increase in rainfall corresponds to a 1.001 (95% CI, 1.001-1.002) times increase in malaria risk while the relative risk of having malaria decreases by 4.7% for every extra unit increase in temperature; 0.9530 (95% CI, 0.922-0.986). Afforestation, reduction in emission of greenhouse gases, avoidance of bush burning are recommended as mitigation measures for reducing the influence of climate change on malaria occurrence.

Keywords: Link function, malaria, meteorological variables, negative binomial regression, Nigeria.

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