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Impact of climate and environmental change on malaria disease patterns

Wondwossen Beyene Debebe
University of Gondar, Ethiopia

The impact of climate and other environmental changes on population health poses radical challenges to scientists. A fundamental characteristic of this topic was the persistent combination of complexity and uncertainty. This research seeks to identify the nature and scope of the problem, and to explore the conceptual and methodological approaches to studying these qualitative and quantitative relationships, modeling their future realization, providing estimates of health impacts, and communicating the attendant uncertainties. Climate has been established as an important determinant in the distribution of vectors and pathogens. The purpose of this case study was to seek out relationships between the global and local climatic variables, which currently best describe malaria outbreak. So, climate data, malaria morbidity data and different oceanic and atmospheric indices will be used to explore the temporal and spatial climatic pattern in terms of the annual and seasonal outlook with respect to increasing/decreasing trend regarding malaria prevalence. The correlation analyses between seasonal rainfall of North Gondar watersheds and climatic parameters such as local and global oceanic-atmospheric indices have significant relationship with seasonal rainfall of the area in addition to ENSO. Forecasting of March to May (MAM), June to August (JJA) and September to November (SON) seasons using climatic parameters are also possible with reasonable skill of at the area. The stepwise multiple linear regression method will be used to develop the forecasting model. In addition, the analyses will be done using SYSTAT 8.0 software in the development of malaria outbreak predictive model on which stepwise multiple linear regressions was employed to screening potential predictors. The malaria outbreak model will be used to show the predictability of malaria incidence before occurrence with certain skill at North Gondar watershed. Therefore, user tailored seasonal climate early warning information is very critical for malaria outbreak over the study area.

beyene.wonde@gmail.com