

Effect of climatic variability on malaria trends in Baringo County, Kenya

Background

Malaria transmission in arid and semi-arid regions of Kenya such as Baringo County, is seasonal and often influenced by climatic factors. Unravelling the relationship between climate variables and malaria transmission dynamics is therefore instrumental in developing effective malaria control strategies. The main aim of this study was to describe the effects of variability of rainfall, maximum temperature and vegetation indices on seasonal trends of malaria in selected health facilities within Baringo County, Kenya.

Methods

Climate variables sourced from the International Research Institute (IRI)/Lamont-Doherty Earth Observatory (LDEO) climate database and malaria cases reported in 10 health facilities spread across four ecological zones (riverine, lowland, mid-altitude and highland) between 2004 and 2014 were subjected to a time series analysis. A negative binomial regression model with lagged climate variables was used to model long-term monthly malaria cases. The seasonal Mann–Kendall trend test was then used to detect overall monotonic trends in malaria cases.

Results

Malaria cases increased significantly in the highland and midland zones over the study period. Changes in malaria prevalence corresponded to variations in rainfall and maximum temperature. Rainfall at a time lag of 2 months resulted in an increase in malaria transmission across the four zones while an increase in temperature at time lags of 0 and 1 month resulted in an increase in malaria cases in the riverine and highland zones, respectively.

Conclusion

Given the existence of a time lag between climatic variables more so rainfall and peak malaria transmission, appropriate control measures can be initiated at the onset of short and after long rains seasons.