

Spatial clustering of malaria and associated risk factors during an epidemic in a highland area of western Kenya

Abstract:

The epidemiology of malaria over small areas remains poorly understood, and this is particularly true for malaria during epidemics in highland areas of Africa, where transmission intensity is low and characterized by acute within and between year variations. We report an analysis of the spatial distribution of clinical malaria during an epidemic and investigate putative risk factors. Active case surveillance was undertaken in three schools in Nandi District, Western Kenya for 10 weeks during a malaria outbreak in May-July 2002. Household surveys of cases and age-matched controls were conducted to collect information on household construction, exposure factors and socio-economic status. Household geographical location and altitude were determined using a hand-held geographical positioning system and landcover types were determined using high spatial resolution satellite sensor data. Among 129 cases identified during the surveillance, which were matched to 155 controls, we identified significant spatial clusters of malaria cases as determined using the spatial scan statistic. Conditional multiple logistic regression analysis showed that the risk of malaria was higher in children who were underweight, who lived at lower altitudes, and who lived in households where drugs were not kept at home.