# Tropical Medicine and Infectious Diseases 2019: Importance of risk factors associated with malaria for Sub-Saharan African children - Elvire Mfueni - Universite Libre De Bruxelles

**Elvire Mfueni**

Universite Libre De Bruxelles, Belgium

Despite efforts of prevention done in the world, malaria remains a great public health problem with 216 million cases reported in 2017. It is one of first causes of morbidity and mortality in the world; 445,000 deaths in 2017 were due to malaria. The majority of malaria cases occur in Africa.

Households selected for the survey (DHS) were grouped into clusters of which longitude and latitude were recorded. Results from RDTs were used. Variance contribution of factors was estimate with the Generalized Linear Mixed-effects model. Mean Gini decrease was used for measuring importance of each predictor and mean decrease accuracy was used for estimating how much each factor reduces error. GWR were performed in order to assess the heterogeneity of relationships between geographical factors and malaria. A CRT was performed for observing partition of data by the most important independent variable.

We found that wealth status is the first socio-economic factor that contributes in differences of malaria risk. Quantity of rainfall, temperature and density of population were most important environmental factors. While in certain regions; high quantity of rainfall, high temperature or high density of population were associated with an increase in malaria risk; in certain regions the relationship was the inverse. We identified countries with high association with malaria risk and countries having low association with malaria risk. There was however a significant difference between these two groups of countries in the education level of mothers, the use of bed net, the anaemia status, the size of household, density of population. We observed that the country where the child lived was the most important factor for malaria risk and it contributed to half of the variability of malaria risk. Wealth status is the first socio-economic factor that contributes in the differences of malaria risk.

Our study has the potential for driving control effort in the fight against malaria in the continent which represent the majority of global malaria cases. The study indicates that, when implementing health policies, community characteristics must be taken into account. To assess the importance of malaria risk factors for children in sub-Saharan African countries. 61,292 children of 16 countries from DHS and MIS surveys were included in analysis. A regression model with analyse of variance and plots of mean decrease accuracy and mean decrease Gini indices were performed. The most important risk factor was the country and it contributed 52.33 % to the variance of the model. Wealth status of the child's family was the first socio-economic factor which contributed more to the difference of malaria risk among African children. There was no geographic factor among the five most important variables. Quantity of precipitation was the sixth most important factor. Our study has the potential for driving control effort in the fight against malaria in the continent which represent the majority of global malaria cases. The study indicates that, when implementing health policies, community characteristics must be taken into account. The aim of this study was to assess the prevalence of and factors associated with malaria in children under the age of five years in Malawi using GAMM. The current findings show that the government should consider other factors associated with malaria especially in children less than five years of age; such as anaemia, region, residence type, toilet facilities, wealth index, and the use of electricity, mothers' education, children's age and the altitude of the region of residence.

The findings from this study revealed that malaria is still a major problem and is linked to socio-economic factors as well as geographical location. The government should focus on poorer communities from rural and low altitude areas, especially in the Central Region, as their target group of individuals to educate, support and help change mindsets. In addition, children with anaemia should take priority in receiving the necessary health care and support. The key findings also show that there is a need to educate the population through workshops, mobile clinics and various social media platforms on how to prevent malaria in children under five years of age.

The study will help the government and donors to control and possibly eliminate malaria in children less than five years of age. The main focus should be on children with anaemia, mother's education level, wealth index, children's age, the altitude of the place of residence, region, and place of residence, toilet facility and electricity facilities. Furthermore, the model used in this study will help other researchers to compare findings.