

Mapping malaria infection among under-five children in Togo

Presenting Author: Kombate Gountante, Ph.D Candidate

Authors: G.Kombate ^{1,3,5}, I.kone ², B.Douti ³, A.soubeiga ⁴, D.E.Grobbee ¹, MAB van der ²Sande ^{1,5}

¹Global Public Health, Julius Centre, University Medical Centre Utrecht, The Netherlands, ²African School of Economics, Cotonou, Benin, ³Ministry of Health, Public Hygiene and Universal Access to Health Care, Togo,

⁴Interdisciplinary Research Laboratory in Social and Health Sciences, University Joseph Ki-Zerbo, Ouagadougou, Burkina Faso; ⁵Department of Public Health, Institute of Tropical Medicine, Antwerp, Belgium

BACKGROUND

- Malaria is a major health threat in Togo, especially for children under five.
- Environmental and climatic factors have been implicated in the increase and heterogeneity of malaria risk across countries.
- The main objective of this study was to explore the spatial patterns of malaria incidence in Togo.

METHODS

- Geospatial covariate datasets variables from the 2017 Togo Malaria Indicator Survey (TMIS) were used for this study.
- The association between malaria incidence and ecological predictors of transmission was assessed using three regression techniques, namely non-spatial regression, spatial lag model (SLM), and spatial error model (SEM).
- The Akaike Information Criterion (AIC) was used to evaluate the model that best reflects the association.

RESULTS

- Overall, between 2000 and 2015, the mean malaria incidence decreased, although an increase in the average malaria incidence was observed in the Savanes region until 2010 (fig 1)

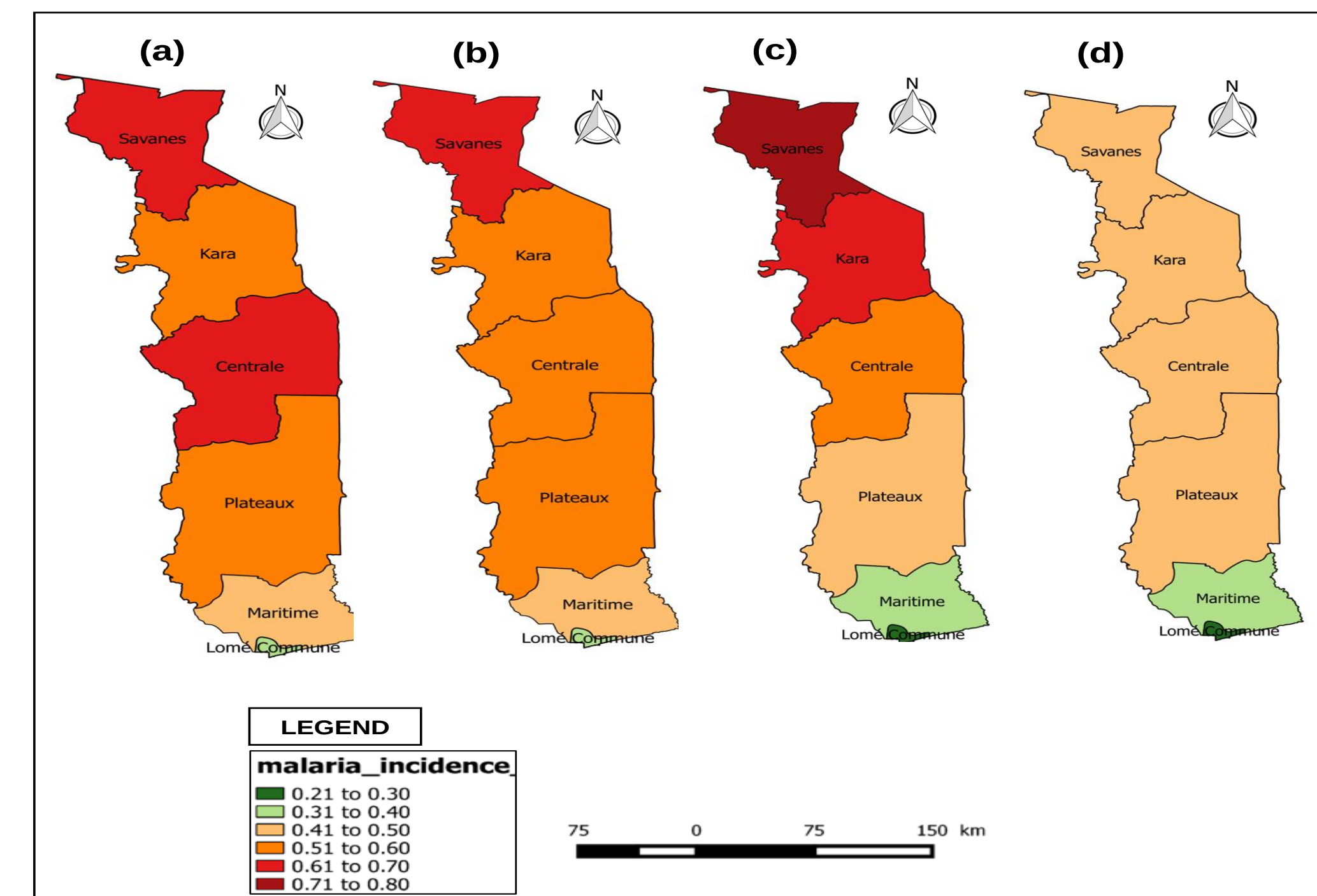


Figure 1: Spatio-temporal variation of malaria incidence in children under 5 years old in Togo: (a) Malaria incidence in 2000, (b) Malaria incidence in 2005, (c) Malaria incidence in 2010, (d) Malaria incidence in 2015

- Spatial autocorrelation (Moran I=0.549, $p < 0.05$), showed that the distribution of malaria incidence was not random, but that there were significant spatial clusters (fig2).

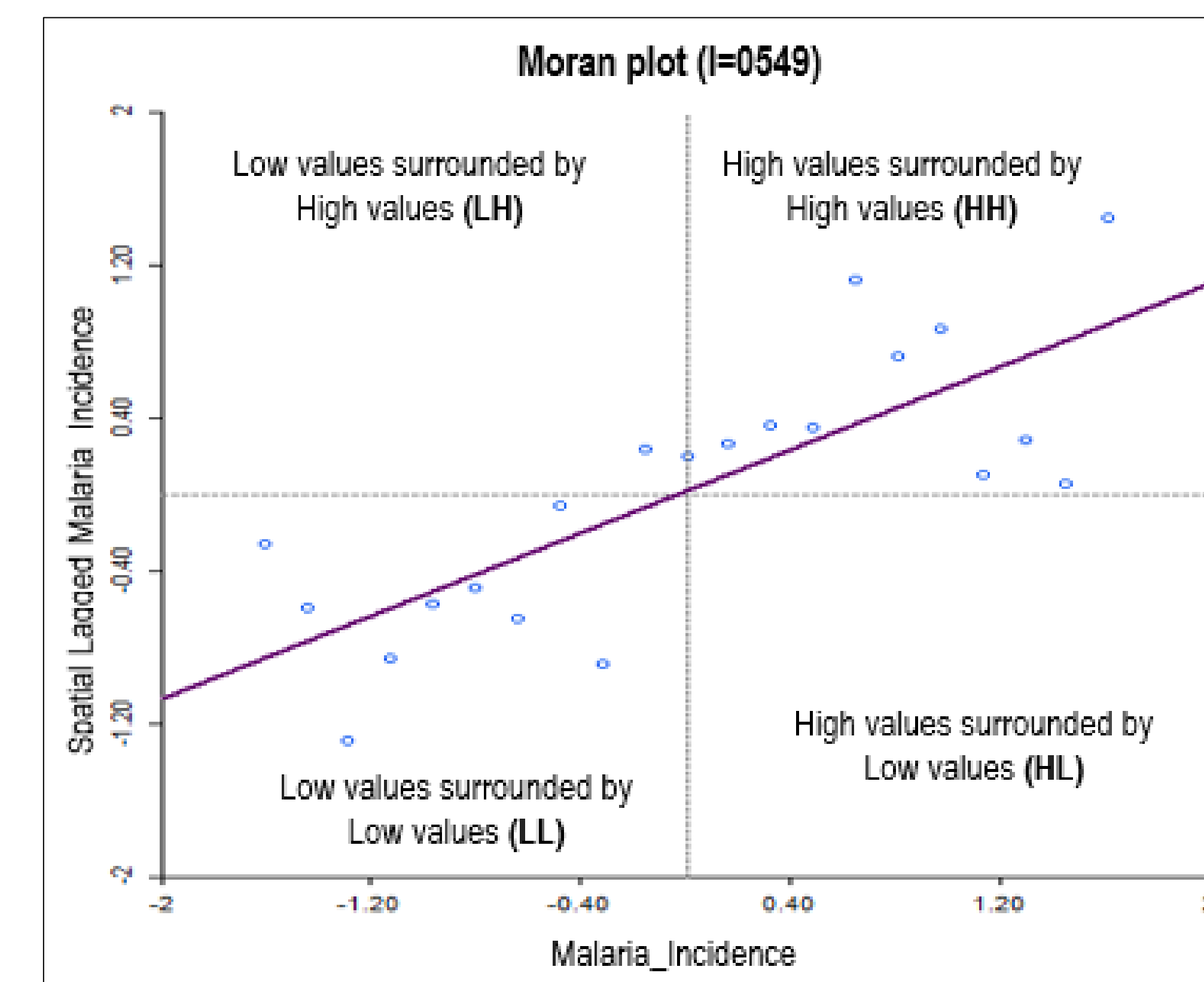


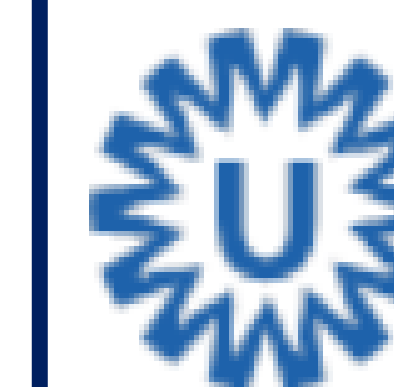
Figure 2: Mean Moran's I values for local spatial autocorrelation for malaria incidence at varying spatial lags

- Annual rainfall, mean temperature, and aridity showed a significant association with malaria incidence rate in the SLM model, which best fitted the data according to AIC;
- Five malaria incidence hotspots were identified.

CONCLUSION

- Malaria incidence is spatially clustered in space in Togo.
- The modelled climatic and environmental predictors of malaria transmission in this study can contribute to the development of specific malaria control plans considering geographical variation and transmission hotspots.

ACKNOWLEDGEMENTS



UMC Utrecht

