How remote sensing data and routine surveillance data can support the forecasting of malaria cases according to geographical risk in Burkina Faso

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Published on: Jun 16, 2023
DOI: https://doi.org/10.21428/3d48c34a.fc64bb54
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**Background:** Reliable data on forecasted malaria cases can provide to public health services and health programs crucial information to optimize resource allocation and anticipate targeted interventions. This study aimed to determine the contribution of prediction models in characterizing spatial risk and forecasting malaria cases according to geographical risk in Burkina Faso.

**Methods:** Malaria incidence prediction models were constructed from weekly malaria surveillance data between 2011 and 2018. Prior, Bayesian spatiotemporal modeling was used to categorize health districts into high-, medium-, and low-risk. Malaria incidence forecasting models specific to each risk category were performed using the SARIMA (Seasonal Autoregressive Integrated Moving Average) model while including remote sensing data (rainfall, temperature, and humidity) as exogenous variables. From the selected models, weekly forecasted incidence were generated over a 52-week period.

**Results:** The observed annual incidence rates were estimated at 24, 155, and 400 cases per 1000 person-years for the low-, medium-, and high-risk areas respectively. The projected incidence rates for 2019 were estimated at 51, 261, and 513 cases per 1000 person-years for low-, medium-, and high-risk areas, respectively. These results suggested an increase in malaria cases in all three areas in 2019 compared with previous years.

**Conclusion:** Our modeling approach using routine data provided an estimate of the expected incidence of malaria. Therefore, this approach could be a practical and useful tool for planning malaria prevention interventions while considering critical areas and time periods.