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Risk Management and Disaster Response in Health Sector: Spatiotemporel Predictive Modelling of Malaria Endemicity in the Northern Zone of Plateau State, Nigeria

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Spatiotemporal Predictive Modelling of Malaria Endemicity in the Northern Zone of Plateau State, Nigeria.

CONTEXT:

- **Malaria endemicity** is the degree to which malaria is persistently present and spread within a particular region. Many variables, including the climatic, ecological, socioeconomic, and human behaviours, have an impact on endemicity.
- **Spatiotemporal malaria modelling** incorporates environmental, meteorological, socio-economic and epidemiological data in modelling the spatial distribution, transmission mechanisms and dynamics of malaria risk over a period.
- **Malaria elimination strategies** carry out a holistic assessment, analysis, evaluation and implementation of the spatiotemporal predictive model as a strategy by Nigeria's Malaria Elimination Programme in the elimination of the disease.

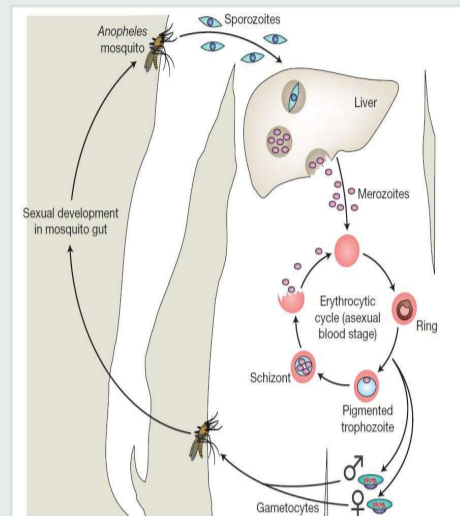


Figure 1: Life cycle of *Plasmodium falciparum*

Source: Rowe et al., 2009

RESEARCH OBJECTIVES:

- **Assessment, Evaluation and Analysis** of Nigeria's malaria endemicity burden and distribution rate as effective tools for measuring the National Elimination Strategies, performance and identify areas of improvement.
- **Develop Spatiotemporal Predictive Modelling** by incorporating ecological, meteorological, socioeconomic and epidemiological datasets to analyse the spatial distribution, transmission mechanisms and the dynamics of malaria risks in Nigeria.
- **Analysis, Evaluation, Validation and Implementation** of the developed spatiotemporal predictive model as effective tool for malaria control and elimination for adoption by the National Malaria Elimination Programme for effective decision-making.

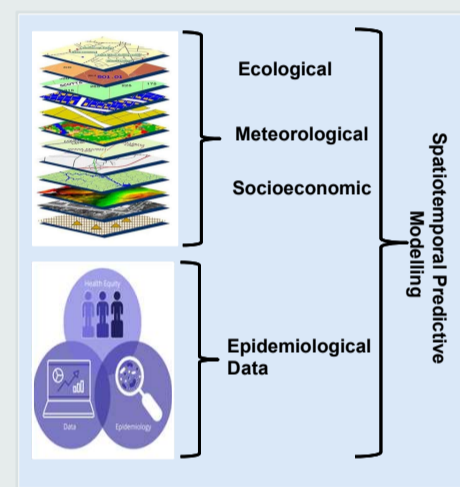


Figure 2: Pictorial and schematic representation of spatiotemporal prediction modelling of malaria endemicity.

Source: White et al., 1993; Cassy, W., 2023

MATERIALS AND METHODS:

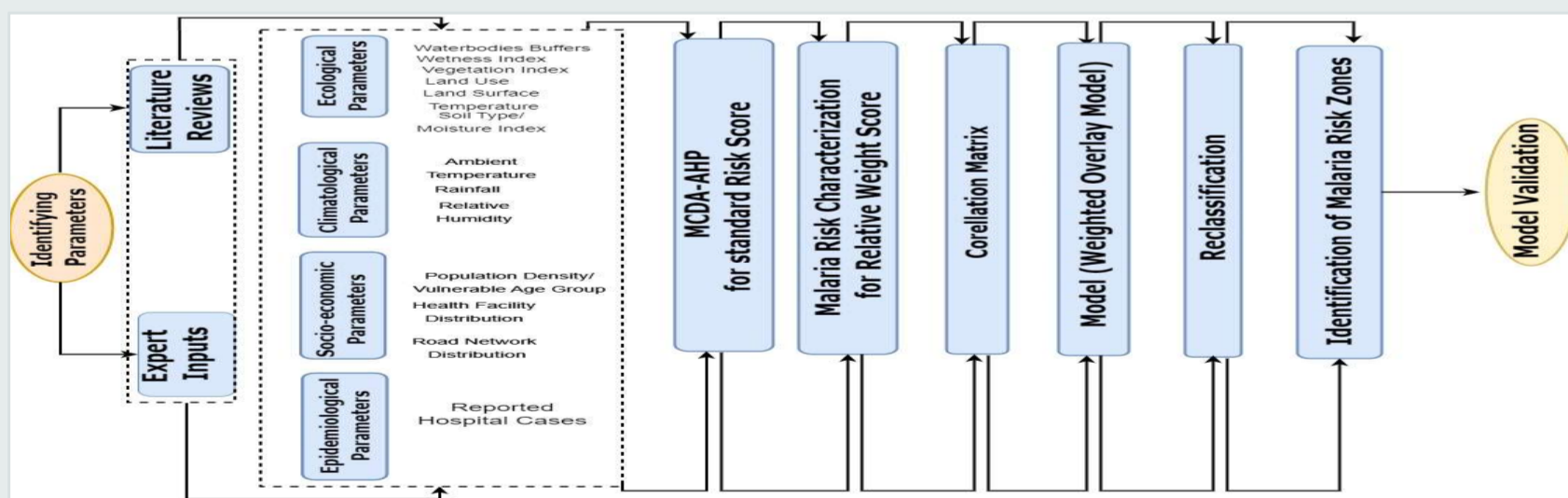


Figure 3: schematic representation of methodology used in the spatiotemporal prediction modelling of malaria endemicity.

OUTCOMES:

- **Spatial Identification** of malaria endemic regions, transmission mechanisms, and a thorough understanding of the dynamics of malaria risk in Nigeria.
- **Determination** of the distribution rates and burden as a management decision-making tool in the effective and efficient planning of scarce resources.
- **An Effective Guide** for the National Malaria Elimination Programme management, policy makers and the Nigerian Government in making informed decisions about the health facilities distribution.

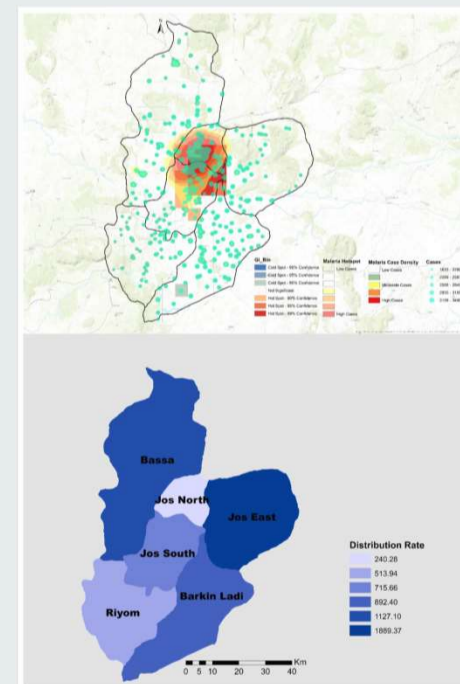


Figure 4: Malaria Risk Model and Distribution Rate

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