Spatial targeting of a household-based intervention for vector control in Côte d'Ivoire

Canelas, T. [1]*; Thomsen, E.[1]; McDermott, D.[1]; Sternberg, E.[1]; Thomas, M.[2]; Worrall, E.[1] – Liverpool School of Tropical Medicine, UK[1]; The Pennsylvania State University, USA[2]

INTRODUCTION

New and multiple vector control tools are needed to reach malaria elimination, and **house modifications** could be part of the solution. However, the lack of information about housing jeopardises the implementation of this strategy. A trial on the use of screening plus In2Care® **EaveTube** (SET) has been conducted in several villages in Côte d'Ivoire, but the feasibility of such intervention or any other eave tube at the national scale is still unknown.

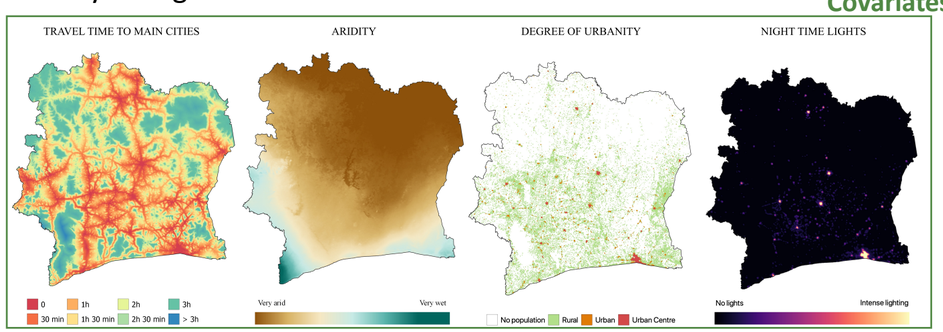
We aimed to predict house suitability and to define the appropriate location where EaveTube could be implemented in Côte d'Ivoire

METHODOLOGY

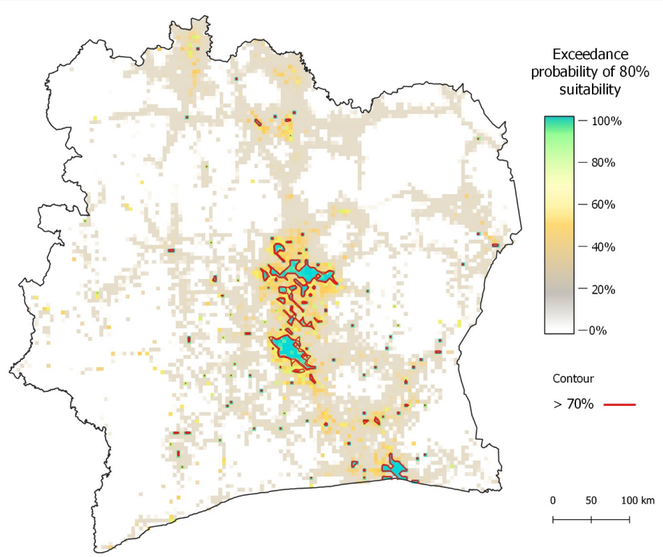
From the 2011 DHS survey, we obtained **roof and wall materials** from the 9686 households. We categorized them whether suitable for SET. We summarized the individual-level DHS survey data into 341 DHS clusters in Côte d'Ivoire.

We fitted a Bayesian beta-binomial logistic model using INLA. We accounted for the spatial correlation using SPDE models, generated from a Delaunay triangulation to estimate a continuous Gaussian field.

Covariates

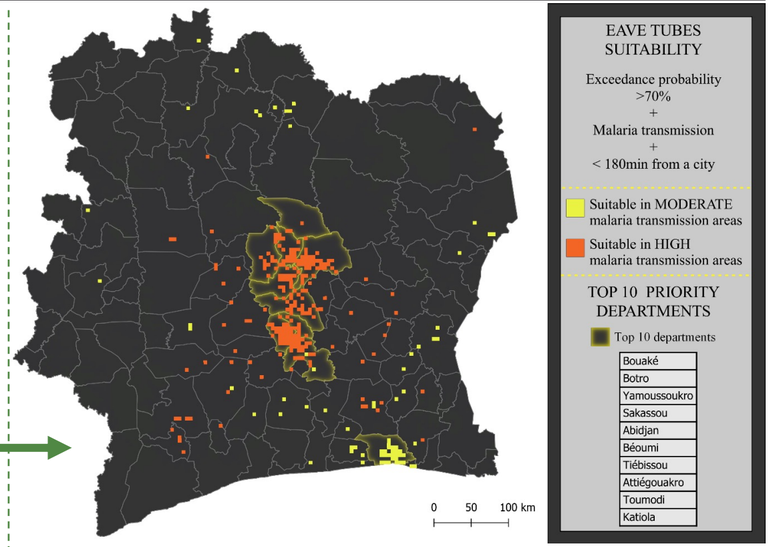


RESULTS



Map should be read as **the probability of x% to have at least 80% of suitable households in the selected area**.

Higher probabilities are found around the cities of Abidjan, Bouake, and Yamoussoukro. Surrounding these cities there were scattered areas of satellite towns and villages.



Departments were prioritised based on exceedance probability, malaria transmission, accessibility and population. Filtered areas reveals an overlap with small / medium towns following the main communication routes. Results can be accessed: https://et-ivc.shinyapps.io/Shiny/

CONCLUSION

- The implementation of eave tubes in Côte d'Ivoire is **limited** in extension.
- The current study provides insights into where eave tubes **scale-up might be most effectively targeted**.
- We find that the most suitable areas appear concentrated in **peri-urban environments**.
- Inclusion of more **up to date data** on housing construction would likely **increase** the number of houses and the total area **predicted to be suitable** for the intervention.

Contact info: tiago.canelas@lstmed.ac.uk