Analysis of Malaria Risk based on Housing Conditions in Sub-Saharan Africa

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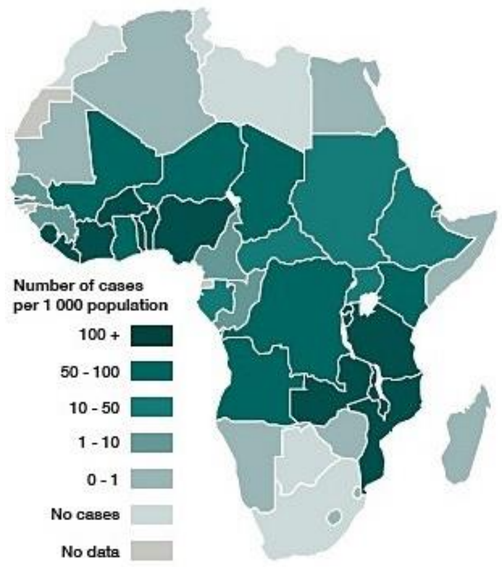
Problem Statement

World Malaria Report [1]:

The World Malaria Report 2014 indicates that mortality rates decreased by 47% between 2000 and 2013 globally and, by 54% in the WHO African Region.



However: 207 million cases worldwide each year

Estimated 627'000 results death

90% of these deaths occur in Sub-Saharan Africa

Endemic Causes

Scientific Reasons:

- Anomalous climate patterns
- Emergence of parasite resistance to antimalarial medicines
- Mosquito resistance to insecticides

Social Reasons:

- Most of the inhabitants are not aware of the risk factors and how to avoid them

How do housing conditions contribute to malaria vulnerability?

- Wall Structure
- Eaves
- Location of the Kitchen
- Floor Structure
- Presence of Electricity
- Insecticide spray
- Presence of Mosquito Nets
- Roof Structure

Our Approach

Goal:

- Determine how housing conditions contribute to malaria vulnerability

Data:

- Analysis on a 3 year epidemiological and housing dataset, collected at Rusinga Island, Kenya

Use Case:

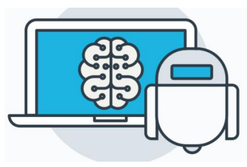
- Public health policy making
- Improving housing conditions

Workflow

Machine Learning

Input Data

- housing conditions
- epidemiology



- **Causal Inference:** housing conditions → risk of malaria infection
- **Patterns:** which housing features contribute the most to malaria vulnerability

Output: Recommendation on

- housing structure unfavorable for mosquitoes
- rural housing planning to avoid spread of malaria

Acknowledgements

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References

[1] World Malaria Report: https://www.health24.com/Medical/Malaria/Multimedia/ Five-facts-you-need-to-know-about-malaria-20150424

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