# Mapping access to healthcare facilities for rabies post exposure prophylaxis bite patients in Makueni County: A spatial analysis

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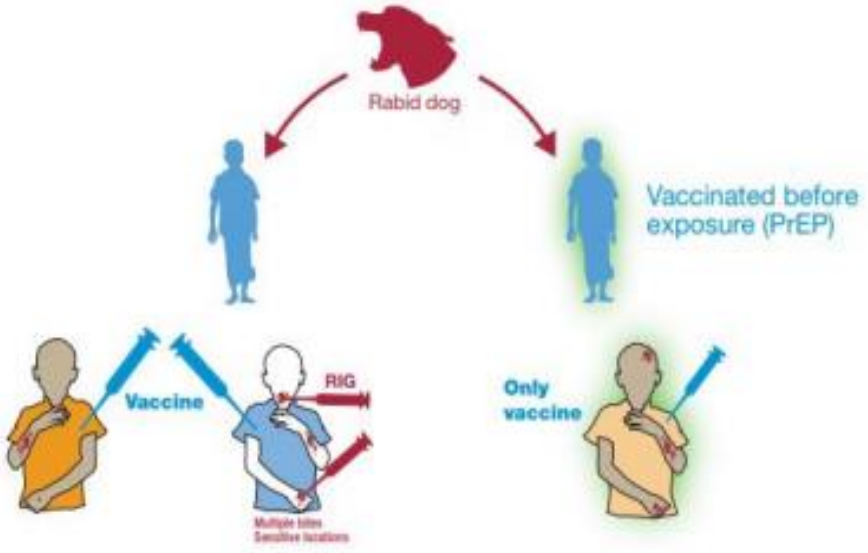
# Introduction




- The focus with most studies on rabies has been transmission dynamics and mitigation strategies that mostly advocate for mass dog vaccinations of up to 70% coverage and human post- exposure vaccination

# Introduction…

***Challenges of PEP***

- Accessibility of PEP
- Affordability of PEP
- Stockouts of PEP in health facility

- Our study aims at using spatial data to map health facility accessibility that could be important in guiding PEP placement which is an on-demand vaccine, expensive and cannot possibly be placed in all facilities.

# Barriers to PEP access

- Geographical accessibility - distance (physical access to health facilities)
- Availability of care sought - available resources needed to give care
- Financial accessibility - relationship between the service pricing, ability and willingness to pay for the services
- Acceptability - social and cultural beliefs and expectations that affect utilization of medical services and interventions

# Objective

1) To assess physical accessibility for post-exposure prophylaxis in Makueni County

2) To determine optimal placement of PEP within the health facility network to increase access

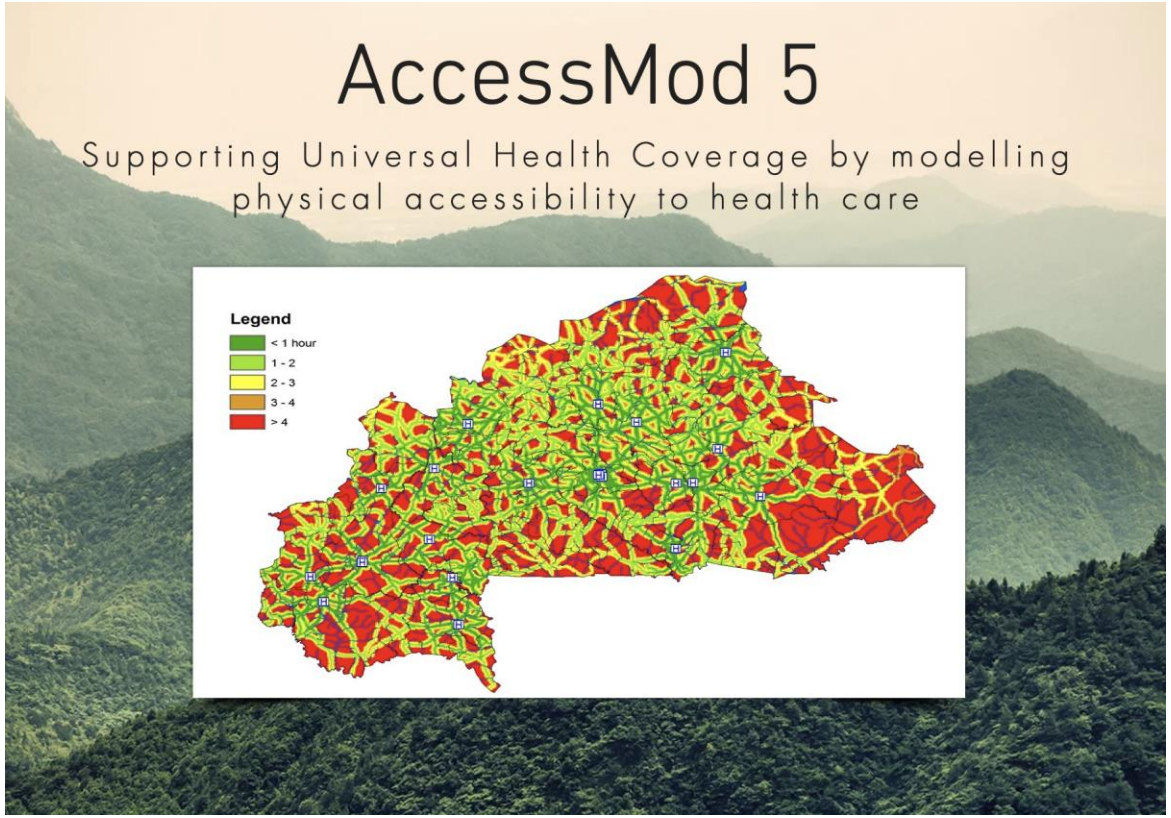
# Methods

- We obtained the following datasets for Makueni county;

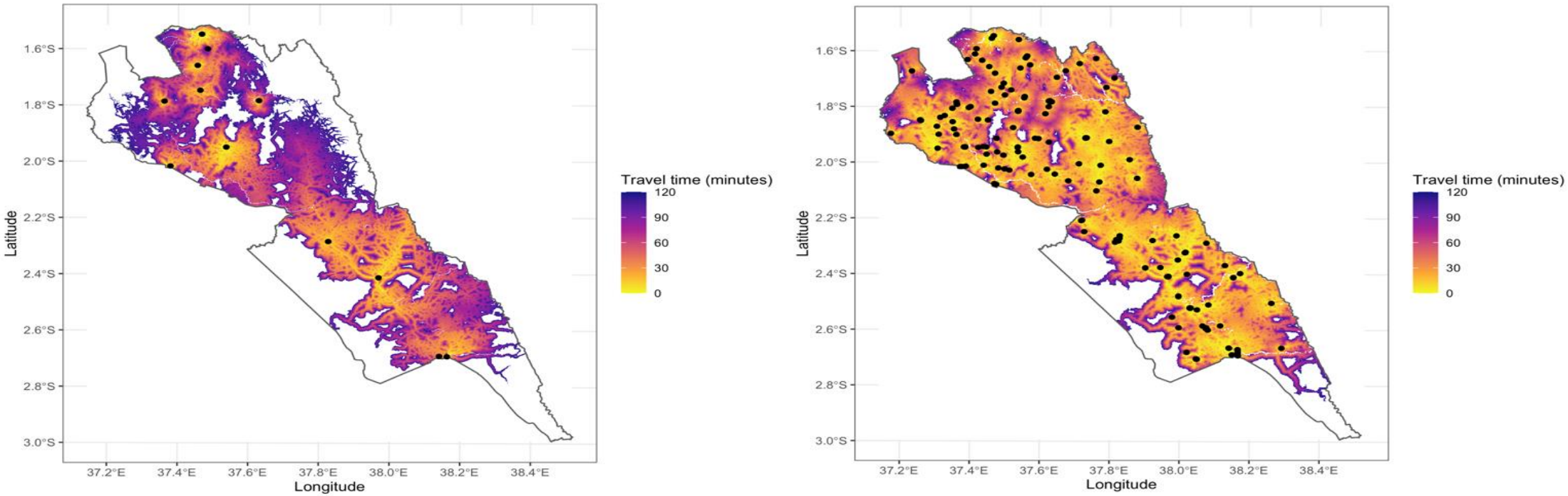
1. Geocodes of the 345 health facilities - (source: http://kmhfl.health.go.ke/#/facility_filter/results?county=ebf51b4b-50ad-4c3e-9cc3-fe04b7eb3b21 )
2. Digital Elevation Mode (30 by 30 m) - (source: https://www2.jpl.nasa.gov/srtm/ )
3. Population distribution (100 by 100 meter population grid) – (source: https://www.worldpop.org/geodata/summary?id=24623)
4. Land use grid (30 by 30 m)– (source: http://geoportal.rcmrd.org/layers/servir%3Akenya_srtm30meters)
5. Hydrographic network containing water bodies - (source: https://www.openstreetmap.org/#map=6/0.172/37.904)
6. Road network containing footways, paths, primary, secondary, tertiary, service, trunk roads) - (source: https://www.openstreetmap.org/#map=6/0.172/37.904)

# Data Analysis

- We used AccessMod to examine physical accessibility and geographical coverage taking into account the spatial distribution of the population and the health system capacity to serve this population.
- AccessMod has been used for medical, obstetric and surgical care like maternity services
- Corrections were applied to the respective travelling speeds (walking and use of motor vehicles) adopted from previous studies

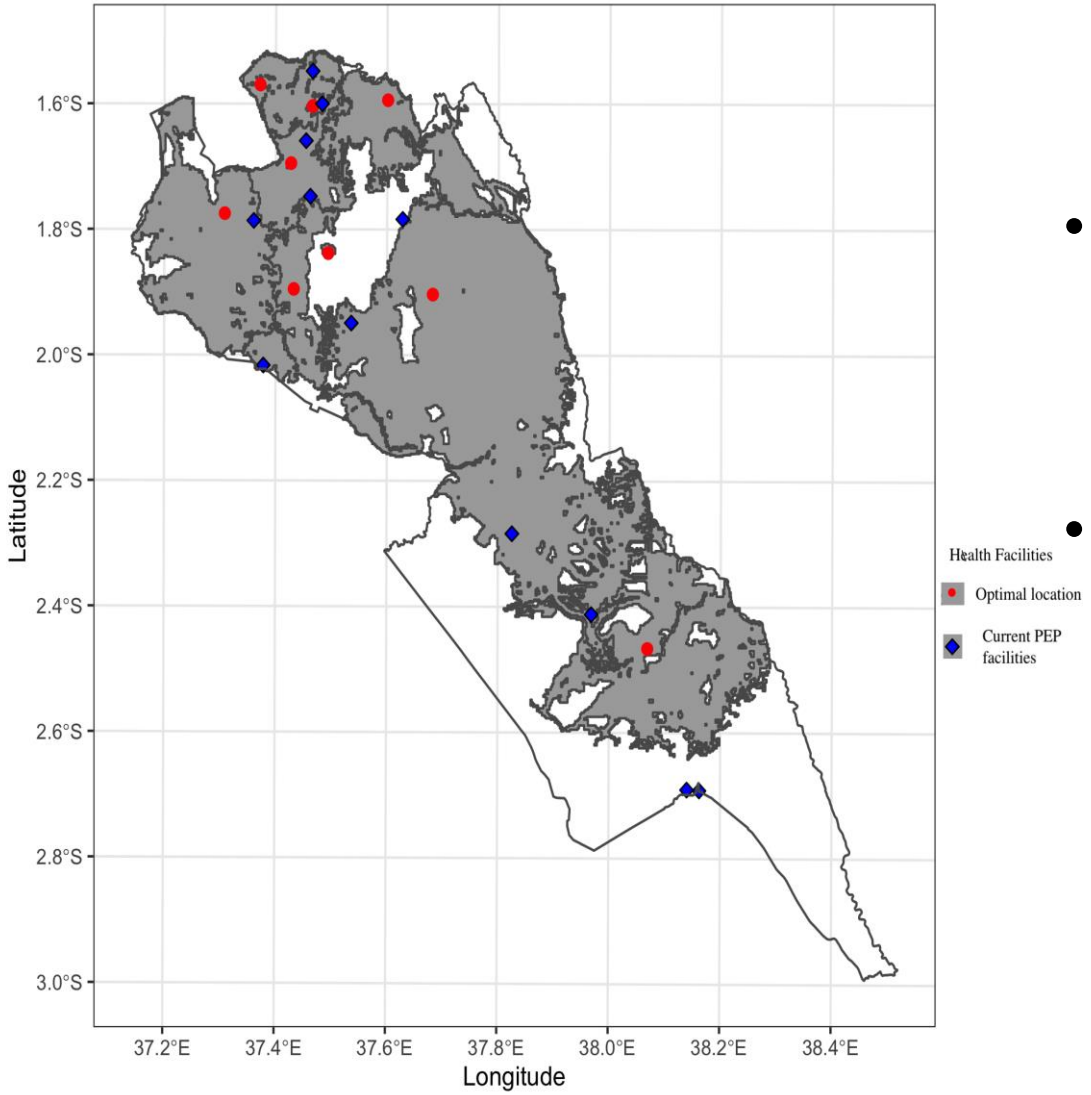


# Results




| | Facilities authorized to stock PEP | | All facilities in Makueni County | |
|---|---|---|---|---|
| Travel Time (walking and motorised) | Population | Percentage Covered (~ 987,700) | Population | Percentage Covered (~ 987,700) |
| = 0.5 hour | 70,417 | 7% | 456,998 | 46% |
| ≤ 1 hour | 118,198 | 12% | 640,512 | 65% |
| ≤ 1.5 hours | 148,801 | 15% | 692,890 | 70% |
| ≤ 2 hours | 167,008 | 17% | 705,039 | 71% |

# Results




- The red dots are the ideal optimal locations for health facilities offering PEP while the blue dots showcase the facilities currently stocking PEP.
- The grey area represents the catchment areas of these current and proposed health facilities stocking PEP in Makueni County.

# Discussion

- The aim is to provide guidance on the best way to ensure that potential bite victims get the timely vaccination especially in rabies endemic countries.

- This paper is an initial attempt to study the relationship between health facility travel time and barriers between on demand vaccines like rabies.

- Initial analysis given number of health facilities within the county and the population can be used to draw the conclusion that most health facilities are accessible. This is not truly the case form our analysis therefore showing that barriers play a major role in accessibility.

# Limitations

- The role of the private sector in PEP provision is essential but remains poorly focused on.

- Lack of access to private health facilities records on PEP stockage and consumption - This limits our study's inclusion scope and findings especially with placement of PEP within the health facility network.

# Recommendations

- These are the initial results of the study and the next steps will involve incorporating incidence of human rabies within the county.

- PEP data from private health facilities should be incorporated

- To eliminate and declare freedom from rabies we need data to make informed decisions to monitor and control rabies cases – possible with adoption of the one health strategy of Integrated Bite Case Management (IBCM)

# Acknowledgement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