Targeted-Reactive Investigation in Remote Sleeping Sites to Interrupt Malaria Transmission in Vietnam

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Challenges for Malaria Elimination in Greater Mekong Subregion (GMS)

- The Greater Mekong Subregion (including Vietnam) has specific and significant challenges to malaria elimination including:
  - Artemisinin and partner drug resistance
  - Complex vector biology including forest malaria and outdoor transmission
  - Very high mobile and migrant populations

- Malaria programs in the GMS require **novel tools and approaches** to support case detection, treatment and targeted interventions that consider these challenges

Malaria Elimination in Vietnam

- Vietnam has an aim to eliminate malaria by 2030

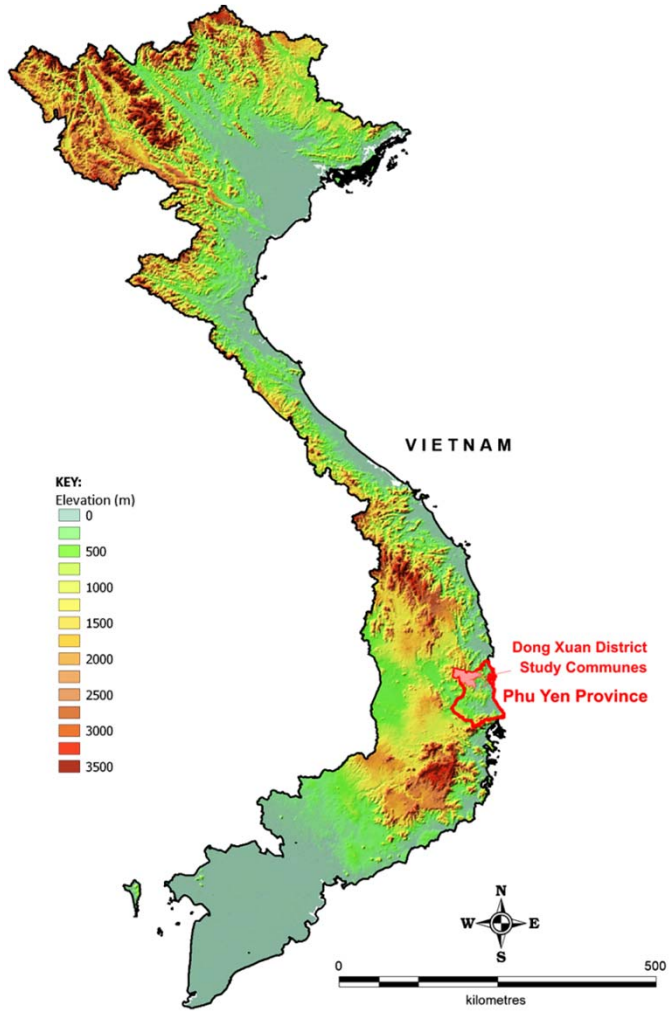
- In Vietnam, it is suspected that over 80% of malaria cases occur from transmission in forests or on farms
  - As such, traditional village-based interventions such as reactive case detection (RACD) has limited impact (and high costs) in these areas

- To **target interventions** effectively an understanding of the micro-epidemiology in these priority areas is essential

Targeted Reactive Investigation at Sleeping Sites Study

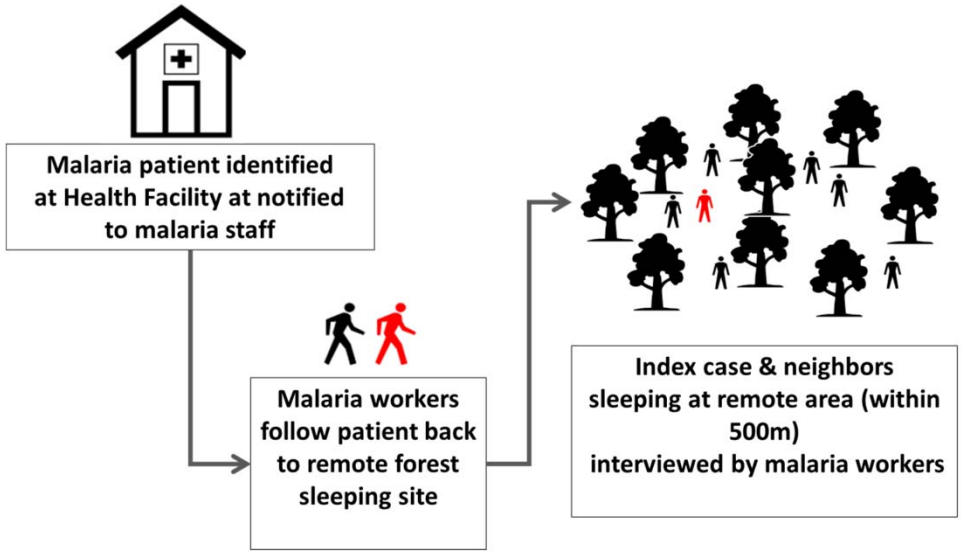
- AIMS OF THE STUDY
  - To pilot a targeted-RACD approach to collect information from malaria patients **at remote area sleeping sites** where malaria transmission was suspected to have occurred
  - To identify associated malaria prevention, treatment and **risk behaviors** of individuals frequenting these areas

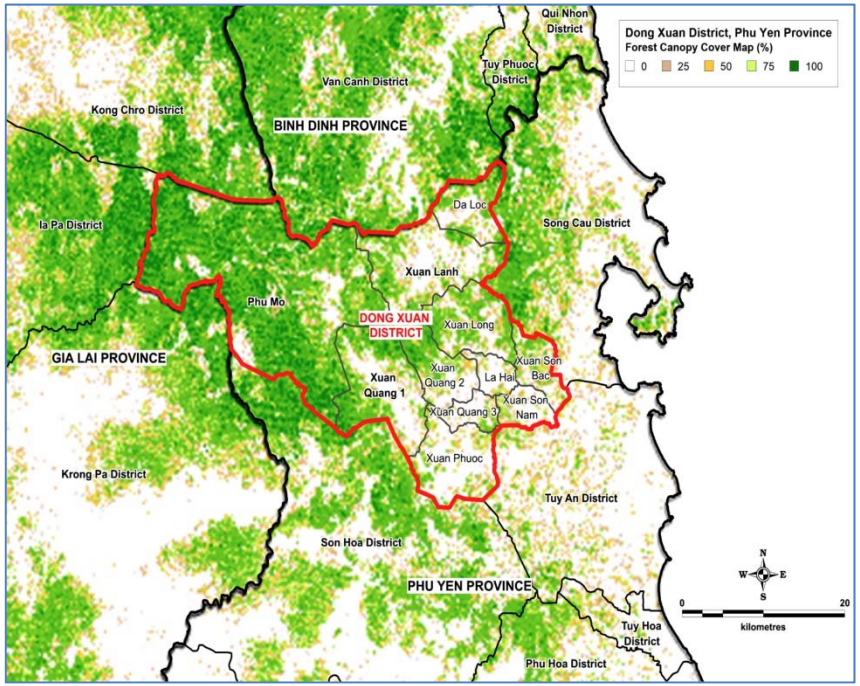
- STUDY SITE:
  - Three mountainous communes - Phu Mo, Xuan Lanh, and Xuan Quang 1, of Dong Xuan District, Phu Yen Province, Vietnam.



Targeted Reactive Investigation at Sleeping Sites Study

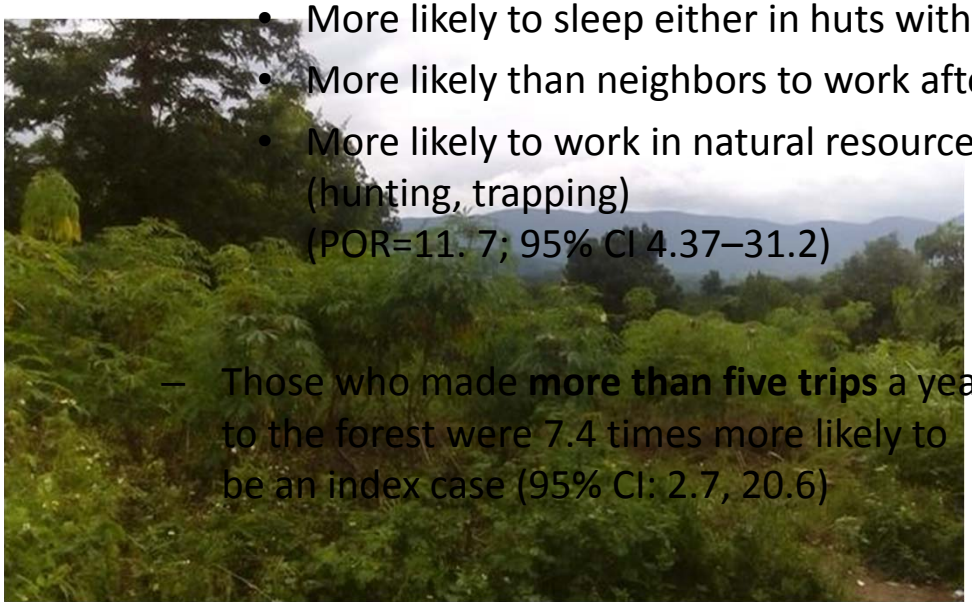
- METHODS
  - Analytical cross-sectional study of forest-goers between April and Sep 2016
  - 110 malaria patients who routinely slept in forest or farm
  - 197 neighbours (within 500m of patient's remote sleeping site)
  - Face-to-face interviews conducted in the field using smart-phone device
  - Statistical analysis using logistic regression models





Targeted Reactive-Investigation at Sleeping Sites Study

- KEY RESULTS
  - Of the 110 index cases:
    - 82% were males with a mean age of 36.6 years
    - The proportion of illiterate respondents was 23%
  - Index cases who **slept in the Forest** were:
    - Less likely to use insecticide treated nets (ITNs) (adjusted-POR=0.10; 95% CI 0.02–0.58)
    - Likely not to use any net when sleeping (POR=2.95; 95% CI 1.26–6.92)
    - More likely to sleep either in huts without walls or outdoors (POR=44.0; 95% CI 13.0–148)
    - More likely than neighbors to work after dark (adjusted POR=6.33; 95% CI 1.92–20.9)
    - More likely to work in natural resource occupations (hunting, trapping) (POR=11. 7; 95% CI 4.37–31.2)
  - Those who made **more than five trips** a year to the forest were 7.4 times more likely to be an index case (95% CI: 2.7, 20.6)

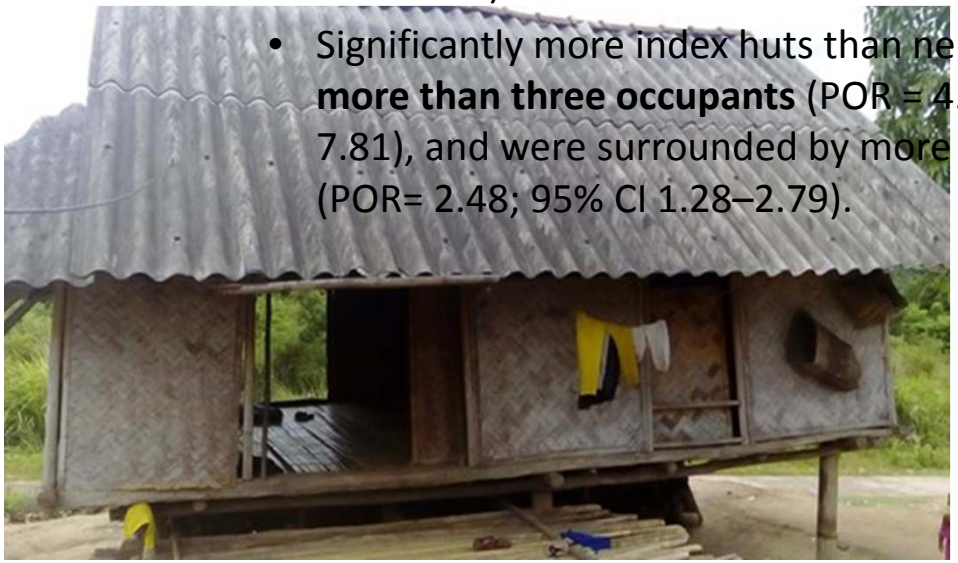


Targeted Reactive Investigation at Sleeping Sites Study

- KEY RESULTS
  - Index cases who **slept at Farms**:
    - A significantly higher proportion of index cases were involved in planting or logging on farms (POR=2.74; 95% CI 1.27–5.91)
    - Proportions using ITNs and no nets were not significantly different between index cases and neighbors
    - The majority of both index cases and neighbors made four or fewer trips per year to work at a farm, and stayed for less than 20 days at a time

Targeted Reactive Investigation at Sleeping Sites Study

- KEY RESULTS
  - Remote Area Site Sleeping Site / Hut Characteristics
    - Study Participants lived in 180 huts, of which **21 huts (60 malaria cases)** had two or more cases per hut, 50 huts had one case, and 109 huts had no cases
    - Neighbour huts were **significantly closer to their official homes** than the index huts — 3.10 times more likely to be within a 30 minutes motorbike ride (95% CI 1.87–5.13).
    - Significantly more index huts than neighbour huts had **more than three occupants** (POR = 4.63; 95% CI 2.74–7.81), and were surrounded by more than 3 huts (POR= 2.48; 95% CI 1.28–2.79).



Targeted Reactive Investigation at Sleeping Sites Study

- CONCLUSIONS
  - Study results indicate that even in remote forest settings **sleeping sites are often clustered**
    - Targeting potential co-exposed individuals at the suspected transmission locations may be a feasible **alternative approach** to traditional village based operations
  - Identifying at risk individuals participating in forest and farm activities and **associated risk behaviors** in these settings provides valuable insight for programs
    - Targeting **at risk individuals** with appropriate interventions – such as insecticide treated sleeping materials, personnel protection; and culturally appropriate education
  - **Novel approaches** are essential to target interventions at transmission sites to interrupt malaria transmission

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Thank you