Malakit & Curema: malaria control interventions tailored to mobile gold miners in the Guiana Shield

Dr Yann LAMBERT
Centre d’Investigation Clinique Antilles-Guyane Inserm 1424
Cayenne Hospital
French Guiana

Douine M, Sanna A, Galindo M, Jimeno I, Plessis L,
Vreden S, Hiwat H, Marchesini P, Suarez-Mutis M

PAVE Regional meeting 2022
Objective: Malaria Elimination by 2025
A soil rich in gold

A huge malaria reservoir

PCR-Plasmodium prevalence = 22%
Self-medication: 52%
With ACT = 90%

Douine et al, Mal Jal 2016
The kit

- 3 RDTs Carestart® PanLDH
- 1 treatment with artemether-lumefantrine
- + 1 single dose of primaquine (15 mg)
- paracetamol

+ insecticide-treated mosquito net
Malakit distribution
Logistic bases at borders

Community based approach

- Facilitators with good knowledge of the study population
Results
Kit distribution and use

- 4,766 kits distributed
- 3,733 participants
- 631 follow-up visits
- 303 reported kit use because of malaria symptoms
- 30% of the population
- 70% correctly used

2-year intervention
From 2018 to 2020

Douine et al, Lancet Reg Health-America 2022
Results

- **Testing before treatment with certified ACT**
  - Pre-intervention survey: N = 599
  - Post-intervention survey: N = 499
  - Significant increase (p = 0.011)
  - OR = 1.8 [1.1-3.0]

- **Prevalence of Malaria (PCR)**
  - Pre-intervention: 22.3%
  - Post-intervention: 3.9%
  - Significant decrease (p < 0.001)

- **Proportion of P. falciparum among positives**
  - Pre-intervention: 58.0%
  - Post-intervention: 14.3%
  - Significant decrease (p = 0.031)

Decrease in prevalence and % of *P. falciparum*

Douine et al, Lancet Reg Health-America 2022
Next step: Curema

• Target hypnozoite carriers
  • G6PD POC testing
  • PART: Tafenoquine/Primaquine
  • Follow-up for 14 days: adherence and safety

• Main objectives
  • To reduce overall the prevalence of symptomatic and asymptomatic infections with *Plasmodium* spp.
  • To evaluate the intervention's reach among the target population.
Implementation

- Start in 2023, duration 21 months
- 7 sites of intervention
- 2 facilitators per site

• Eligibility criteria
  • History of clinical malaria in the past 12 months AND/OR
  • Staying for at least 1 month in an area with extensive P. vivax transmission in the past 12 months

• Main exclusion criteria
  • Current pregnancy or breastfeeding
  • G6PD activity < 70%
  • Refusing to participate the 14 days follow-up
# Evaluation

## CUREMA study overall design

<table>
<thead>
<tr>
<th>Intervention (inclusion and follow-up)</th>
<th>Before the intervention</th>
<th>Intervention implementation (21 months)</th>
<th>After the intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core of the project</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Module A with staircase implementation: PQ -&gt; TQ + PQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Each Module A participant is actively followed up for 14 days</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Module B uniformly implemented during the whole intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Core of the evaluation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allowing the collection of data to fulfill primary objectives (both on effectiveness and implementation) as well as secondary objectives</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Pre/post intervention surveys
- 3 months pre-intervention survey (baseline)
- 3 months post-intervention survey (evaluation)

## Health facility and community-based adverse event reporting system
- Tool for the collection of serious adverse event experimented by study participants

## Qualitative assessment
- Essential tool for the analysis of the implementation of the project, helping interpret quantitative results, and allowing the identification of strategy’s strengths and weaknesses.
- It will contribute to the participative elaboration of study components.

## Qualitative data analysis
- Approach contributing in the analysis of the effectiveness of the intervention taking into account the overall regional context (climate, policy changes, etc.)
- Field qualitative assessments during the intervention
- Contribution to project tools and design
- Stake-holders mapping and pre-intervention qualitative survey
- Pre-intervention qualitative field survey
- Stake-holders post-intervention qualitative survey
- Surveillance data collection by health authorities
- Data request and modelling
Thank you for your attention!

www.malakit-project.org
Secondary objectives - Effectiveness

- To assess the evolution of malaria epidemiology before and after the intervention:

- To reduce the species-specific prevalence of P. vivax and P. falciparum among people involved in gold mining activities in the South of the Guiana Shield;

- To reduce the proportion of garimpeiros with a high probability of recent P. vivax infection (and probably hypnozoite carriers);

- To reduce the incidence of malaria cases associated with gold mining activity in the southern Guyanese Shield, as detected by the epidemiological surveillance systems of the countries involved;

- To increase the proportion of garimpeiros who adequately take anti-malarial treatment when they fall ill in illegal garimpos in French Guiana;

- To estimate the individual-level effectiveness of module A intervention in preventing P. vivax parasitaemia;
Secondary objectives - Implementation

- To assess the acceptability (adoption and appropriateness), and actual reach of each intervention module
- To assess the adherence to the primaquine posology among asymptomatic individuals;
- To assess the safety of medicines for Modules A and B on a community scale;
- To evaluate the effectiveness of the health education activity carried out during the intervention;
- To assess the acceptability and feasibility of digital tools (smartphone app);
- To evaluate the quality and effectiveness of the training received by facilitators;
- To assess the fidelity of the inclusion and follow-up process;
- To evaluate the sensitivity and specificity of the rapid serological test and to estimate the discriminatory capacity of this test to detect recent P. vivax infections in the epidemiological context of the study;
- To estimate the programmatic cost of the intervention;
- To assess the health situation of garimpeiros and additional health needs beyond malaria elimination;
- Assess facilitating factors as well as barriers to delivering such an intervention in a pre-elimination setting and community involvement to be taken into account for further implementation.