Research perspectives for an analysis of risks of exposure in an hypothetical context of malaria reemergence Camargue (France)

A socio-anthropological approach

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Research linked with:
- *Eden Malaria programme*
- *WP 3: Public health and human activities*
- *One of the objectives:*
  
  To evaluate the impact of public health activities, human movements (and parasite importation), and human activities.

This study
- Located in Camargue’s site (South of France)
- Is at its beginning
- Could be useful for the other sites of Eden Malaria
Three questions:

- which human activities can be linked with exposition to mosquito bites?
- which kind of population (residents/migrants) could be linked with the risk of reemergence?
- how importated or authochtonous cases are «managed» by health personnel and patients?
1. Activities and exposure to mosquito bites

- Methodology
  - To list all human activities in the research zone
  - To determine the distribution in time and space of these activities
  - To estimate the number of residents and persons passing through the zone throughout the different months of the year
  - To collect the discourse of the actors on how they protect themselves against the mosquitoes.
1.1. Activities in the research zone

- c = reed cutting
- ch = hunting
- e = cattle breeding (bulls and horses)
- h = horticulture
- m = gardening
- r = rice farming
- t = tourism
- v = wine-growing
### 1.2. Schedules of activities

<table>
<thead>
<tr>
<th></th>
<th>Summer</th>
<th>Winter</th>
<th>All the year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agricultural Activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horticulture</td>
<td>6 am - 1 pm</td>
<td>8 am - 2 pm</td>
<td>Guided tours</td>
</tr>
<tr>
<td>Wine growing</td>
<td>6 am - 10 pm</td>
<td>8 am - 6 pm</td>
<td>Hunting</td>
</tr>
<tr>
<td>Gardening</td>
<td>6 am - 2 pm</td>
<td>8 am - 2 pm</td>
<td></td>
</tr>
<tr>
<td>Rice farming</td>
<td>9 am - 7 pm</td>
<td>10 am - 6 pm</td>
<td></td>
</tr>
<tr>
<td>Cattle breeding</td>
<td>7 am - 7 pm</td>
<td>8 am - 6 pm</td>
<td></td>
</tr>
<tr>
<td>Reed cutting</td>
<td>7 am - 7 pm</td>
<td>8 am - 6 pm</td>
<td></td>
</tr>
<tr>
<td><strong>Leisure Activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guided tours</td>
<td></td>
<td></td>
<td>9 am - 6 pm</td>
</tr>
<tr>
<td>Hunting</td>
<td></td>
<td></td>
<td>6 am - 8 pm</td>
</tr>
</tbody>
</table>

Most exposed activities: rice farming, wine-growing, reed cutting, cattle breeding
1.3. Residents and persons passing through the zone

<table>
<thead>
<tr>
<th></th>
<th>« Low » season</th>
<th>« High » season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>Permanent workers</td>
<td></td>
<td>105</td>
</tr>
<tr>
<td>Seasonal workers</td>
<td>11 (jan-feb)</td>
<td>106 (may-june)</td>
</tr>
<tr>
<td>Tourists</td>
<td>0 (nov-feb)</td>
<td>2840 (jul-aug)</td>
</tr>
<tr>
<td>Fishermen/hunters</td>
<td>0 (march-jul)</td>
<td>400 (aug-feb)</td>
</tr>
</tbody>
</table>

- Seasonal workers seem to come from the neighborhood (to verify)
- Fishermen and hunters could be the most exposed (considering the season and the schedule of their activities)
- Tourists are exposed, less because their schedule than their inappropriate preventive attitudes
1.4. Protection against mosquito bites

The discourses reveals an opposition between « us » and « them ».

- « Us » = residents, people who do not mind mosquitoes
- « Them » = foreigners, tourists, people who adopt inappropriate attitudes, fears mosquitoes, claiming a more intensive fight measures against mosquitoes

Preventive attitudes facing mosquito bites is also a question of identity
2. Population movements

- Migration from countries where malaria is present is one of the main issue
- A lot of migrants in the south of France come from Northern and Subsaharan Africa.

Questions, in the perspective of reemergence of malaria are:

- Who are the migrants and which countries they come from?
- What kind of activities do they have?
- Where do they live?
2. Population movements

An exemple of non « at-risk » [of reemergence] people: the Comorian population

• Comorian population is one of the most numerous migrant community in Marseilles

• One of the most often infected people by malaria (> 60% patients hospitalised for malaria in Hopital Nord in Marseilles)

• Resident Comorian people use to go to the Comoros for hollidays, with their children if they can

But

• They live in town and their activities are in town
2. Population movements

Looking for « at risk » migrant population

- The variables we need:
  - The country they come from
  - Their residence place
  - Their activities

- The difficulties to collect the information:
  - Not always available in medical data
  - Very disseminated
  - The illegal immigration
  - Fear of employers (seasonal workers)
3. «Management» of malaria attack and prevention

- Malaria notified cases could be interesting for two reasons:
  - Considering the «snow ball» methodology, it could lead to identify groups (patient’s family) exposed to malaria but not ill.
  - Patients are not always compliant to malaria treatments, especially children; incompletely treated, and so far inefficient treatment, are not rare. Could this patients be «at risk» of transmission?

To go ahead with these questions should require micro-approach
Conclusion

- Three questions:
  - Relationships between human activities and adequate « milieu » for transmission
  - Populations movements, migrations, and risk of transmission
  - Declaration and treatment of malaria

- These questions must be explored for other sites by social scientists ("not entomologists“, Didier’s remark)?