

***“Screening mosquito entry points into houses with novel long-lasting insecticidal netting to reduce indoor vector densities and mitigate pyrethroid-resistance”***

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## Aims:

- ① Better understanding of mosquito house entry behavior (door, window, eaves)
- ② Effect of untreated vs insecticide-treated vs no netting in windows and eaves on mosquito densities



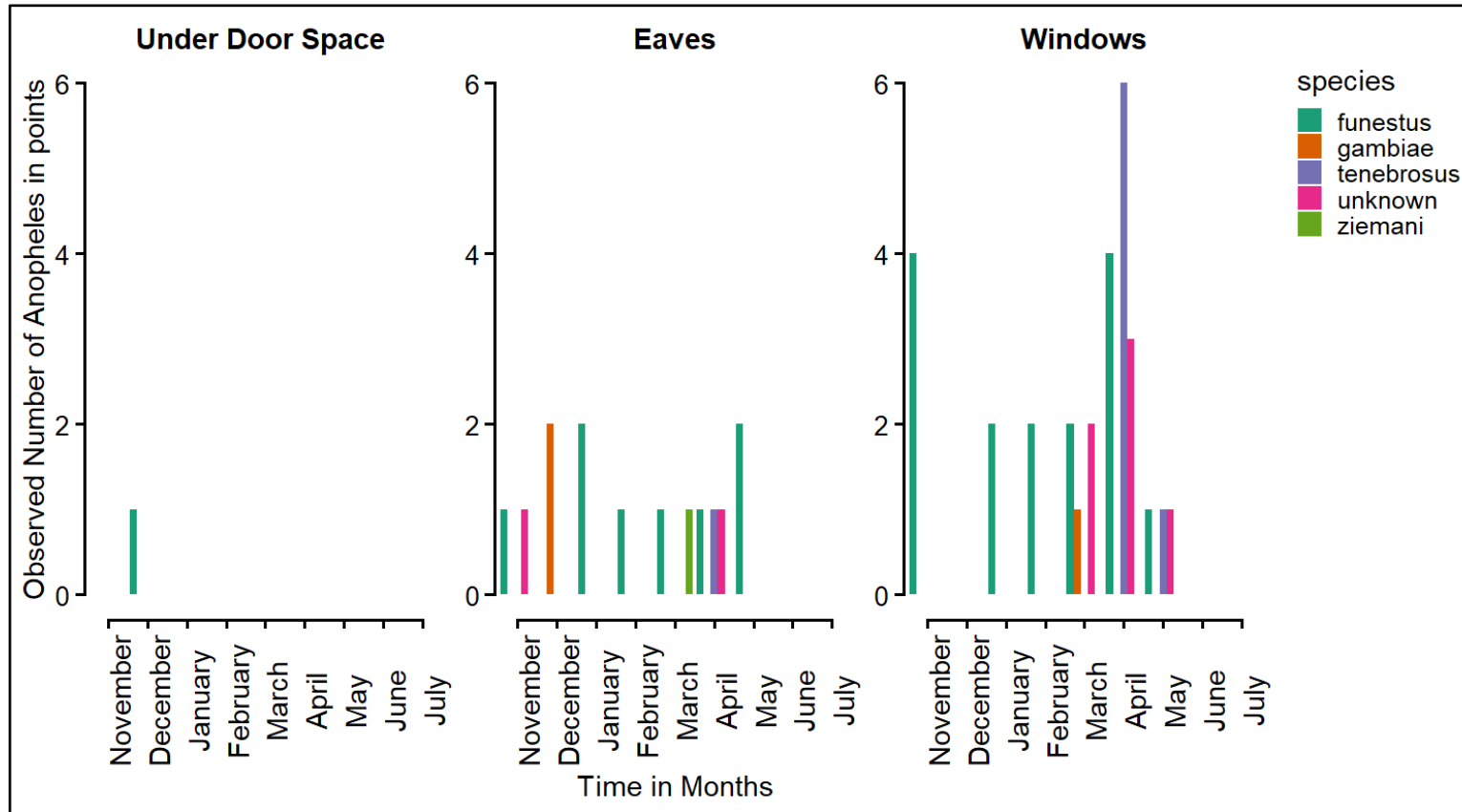
## Methodology:



- **3 by 3 experimental hut trial** (Avima Chlorfenapyr **net-ITM (grey)**, Avima-untreated screening mesh (**white**)-UM, and **control (nothing on the entry points)**)
- **Week 1 every month:** Quantify mosquito entry points (doors, window and eaves)
- **Weeks 2,3,4:** Screen mosquito entry points (windows, doors, and eaves) with AVIMA screening mesh
- Monthly bio-efficacy tests on the meshes.

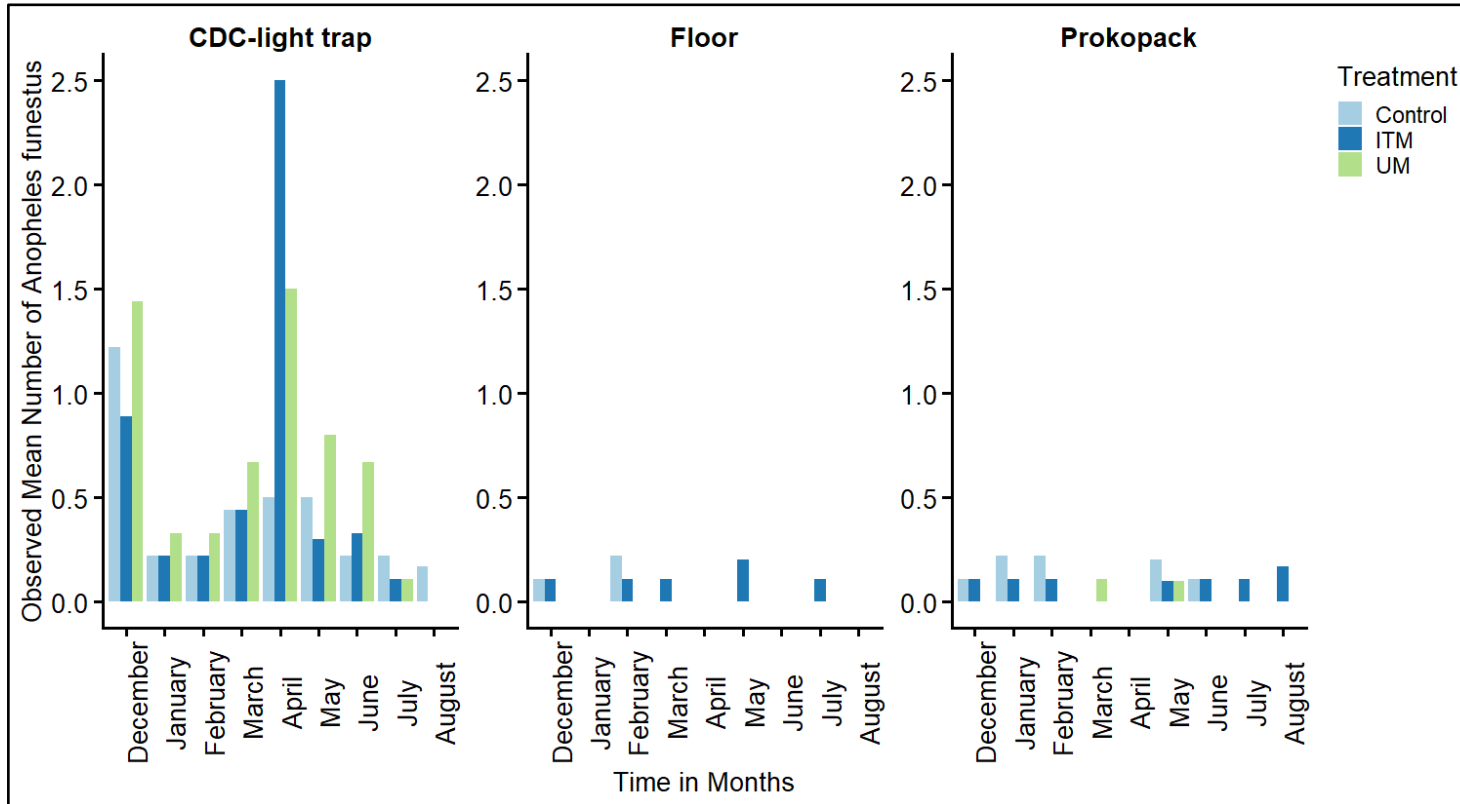


## Findings: Mosquito house entry points



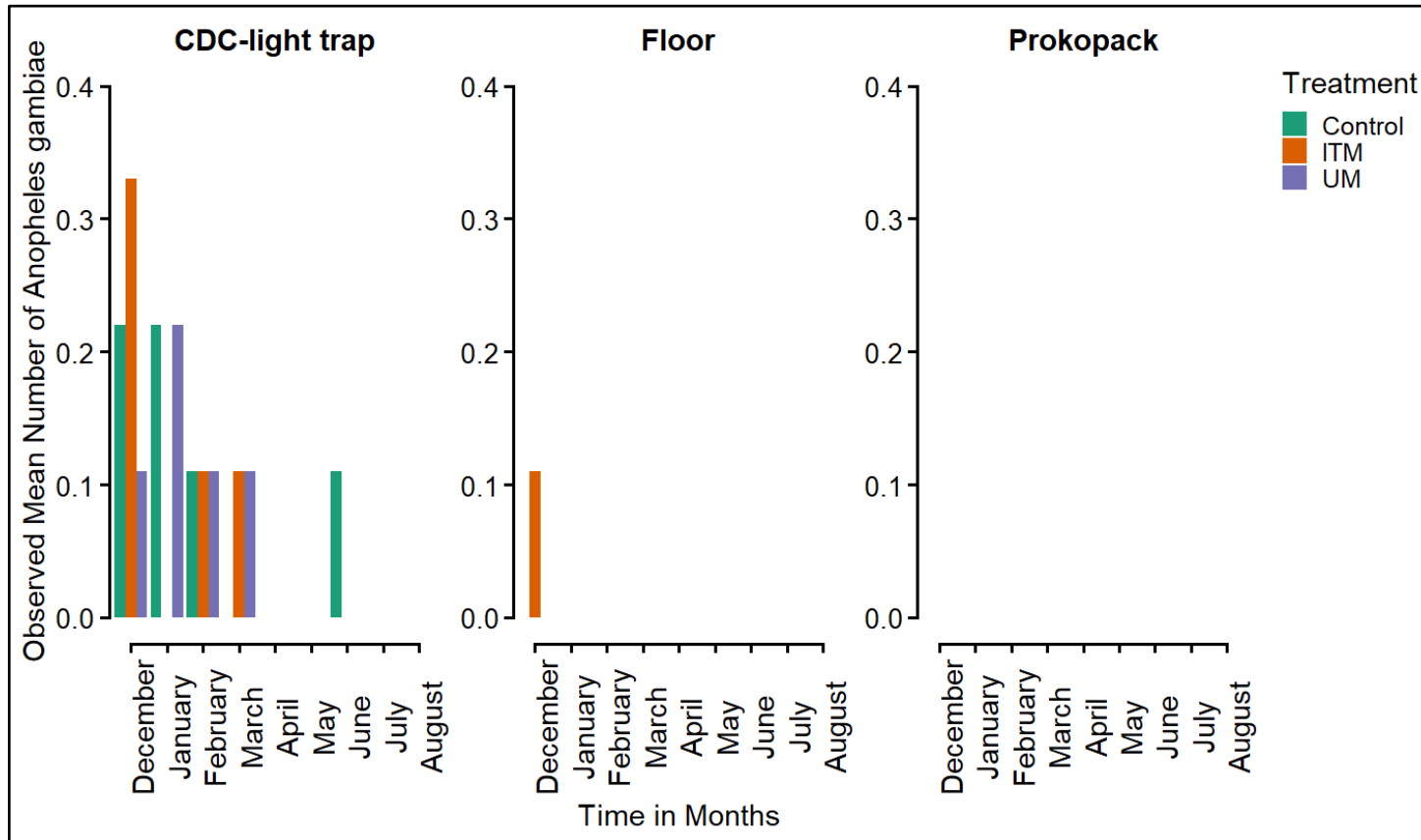
- Low density perhaps our traps need redesigning as the density was higher in the screened huts

# Screening findings: *An. funestus* densities



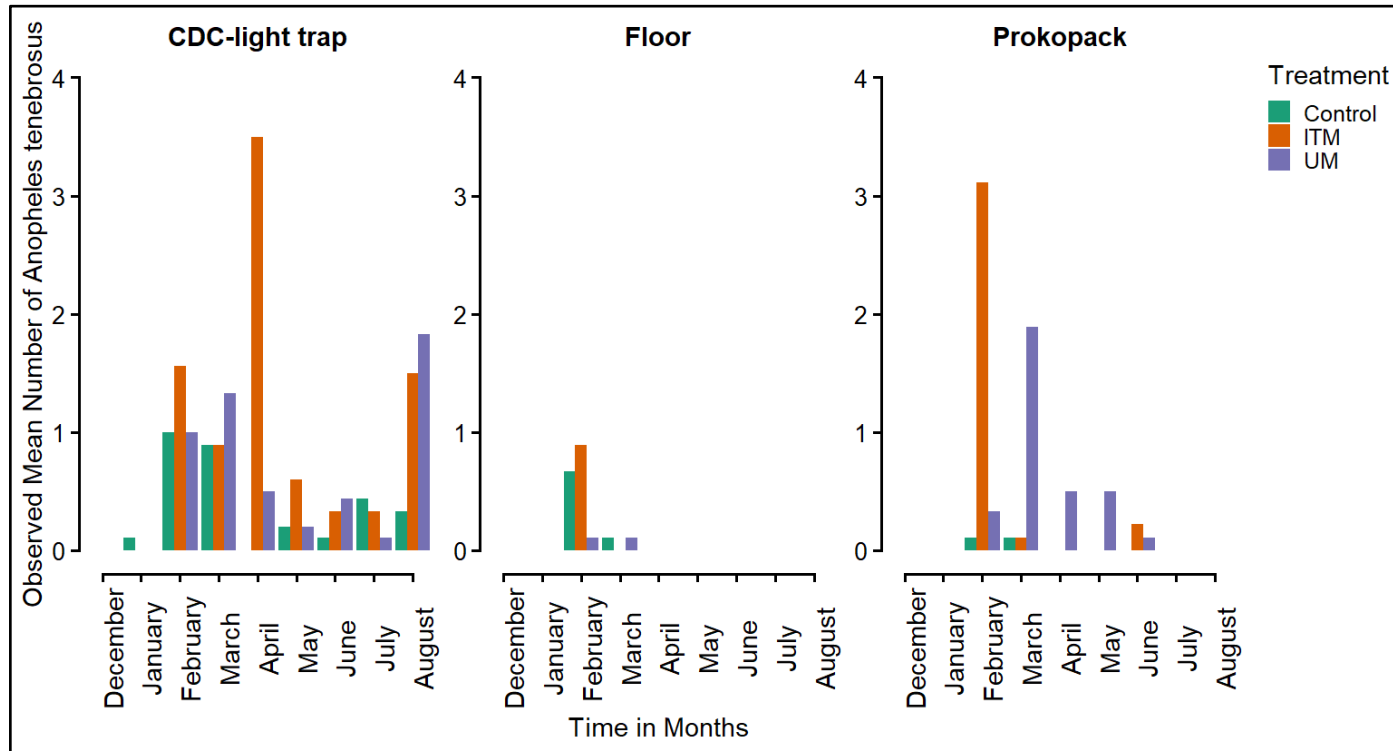
- ❖ Lack of differences in CDC-light trap may be expected as Chlorfenapyr does not repel or irritate mosquitoes.
- ❖ We expected mosquitoes to crawl through the big holes on screens and pick sufficient insecticide doses, but low mosquito numbers to assess delayed mortality effect.

# Screening findings: *An. gambiae* densities



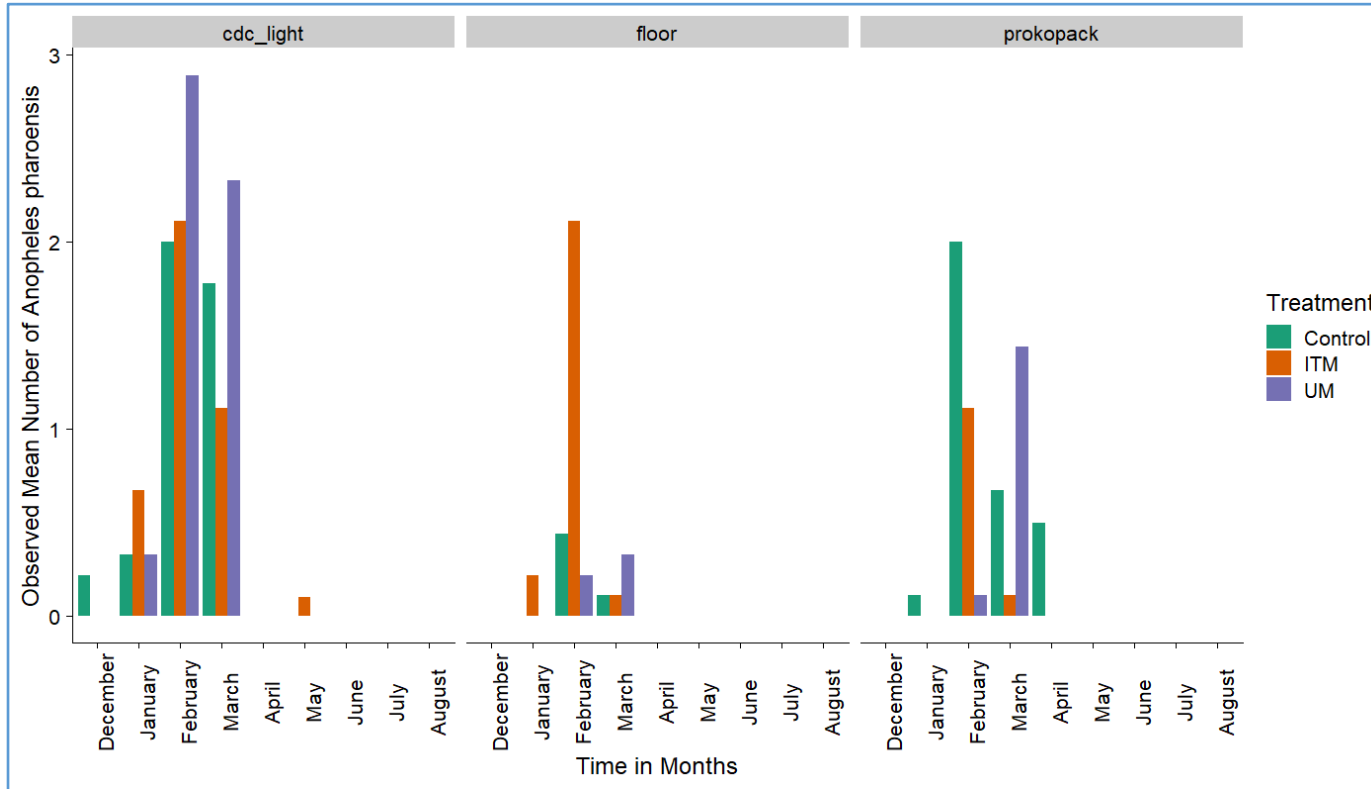
- ❖ Lack of differences in CDC-light trap may be expected as Chlorfenapyr does not repel or irritate mosquitoes.

# Screening findings: *An. tenebrosus* densities



- ❖ Lack of differences in CDC light trap may be expected as Chlorfenapyr does not repel or irritate mosquitoes.
- ❖ We expected mosquitoes to crawl through the big holes and pick sufficient insecticide doses, but low mosquito numbers to assess delayed mortality effect.

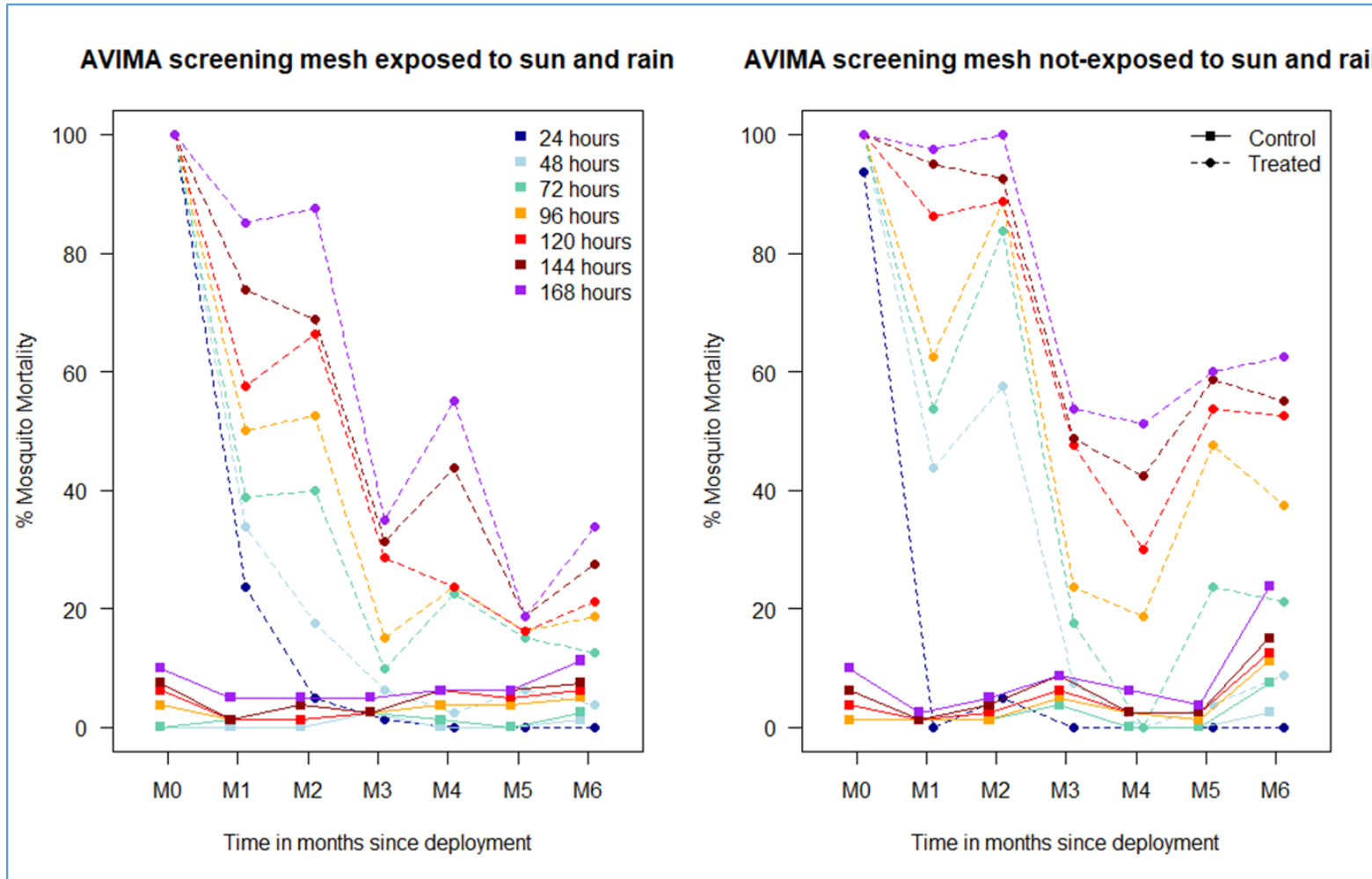
# Screening findings: *An. pharoensis* densities



- ❖ No differences in CDC light trap may be expected as Chlorfenapyr does not repel or irritate mosquitoes.
- ❖ We expected mosquitoes to crawl through the big holes and pick sufficient insecticide doses, but low mosquito numbers to assess delayed mortality effect.



# Findings: Bio-efficacy of the AVIMA mesh (WHO cone assays)



- Bio-efficacy below 80 % threshold by month 2
- Delayed mortality seems to improve



## ***Conclusions and way forward:***

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- The screening meshes did not reduce the mosquito density/entry into huts
- The effect on delayed mortality could not be assessed due to insufficient mosquito numbers (the idea was that mosquitoes pick up more insecticides while crawling through the mesh)
- Bio-efficacy of Avima chlorfenapyr-treated mesh is shorter than expected (similar to what is described in recent literature)
- Quantifying the product from the mesh has been difficult (due to the different production process)
- Lower concentration of the chemical content on the surface of the mesh.

## ***Conclusions and way forward:***

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- For the remaining months assess AVIMA alpha-cypermethrin screens instead of chlorfenapyr for screening, with a focus on secondary vectors that are responsible for residual malaria transmission.
- New batches of improved chlorfenapyr screens will be assessed in cone bio-assays to assess killing efficacy over time, but this active ingredient may need to be combined with another a.i. in a future product

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## Illovo Maragra sugar cane company

- Illovo Sugar Ltd. (Maragra)



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