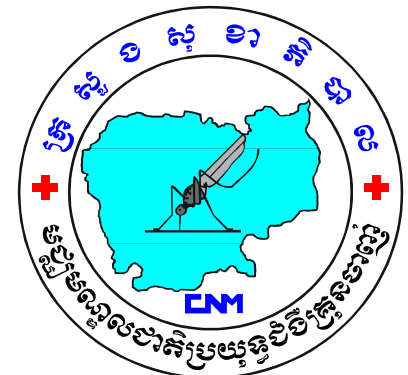
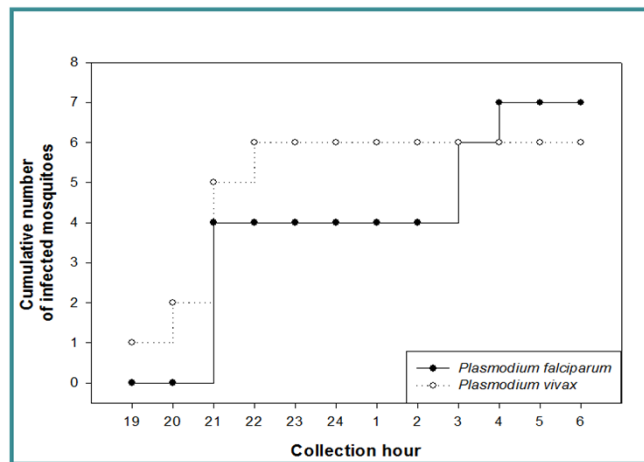
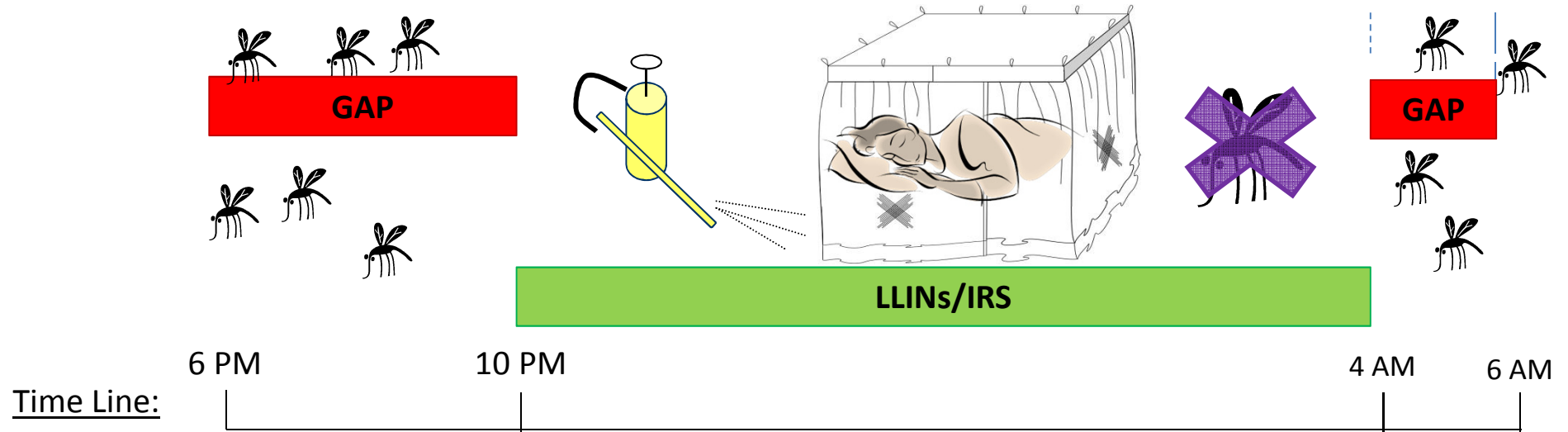


A Challenge of Residual Transmission in GMS

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Context: Early biting and transmission

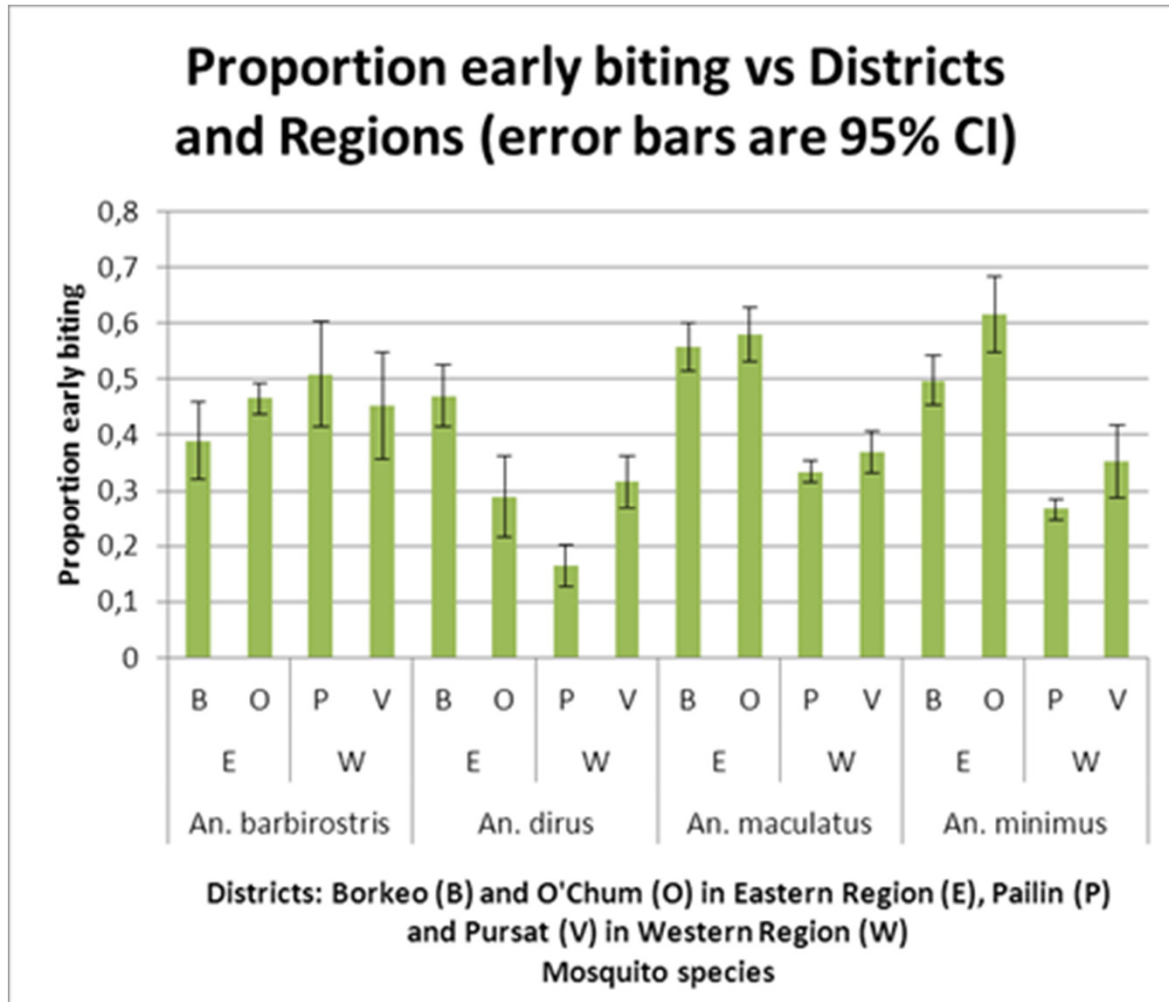


In Central of Vietnam:

⇒ 60% of the vectors bite before sleeping time

⇒ All infective bites occur before 22h and after 4h.

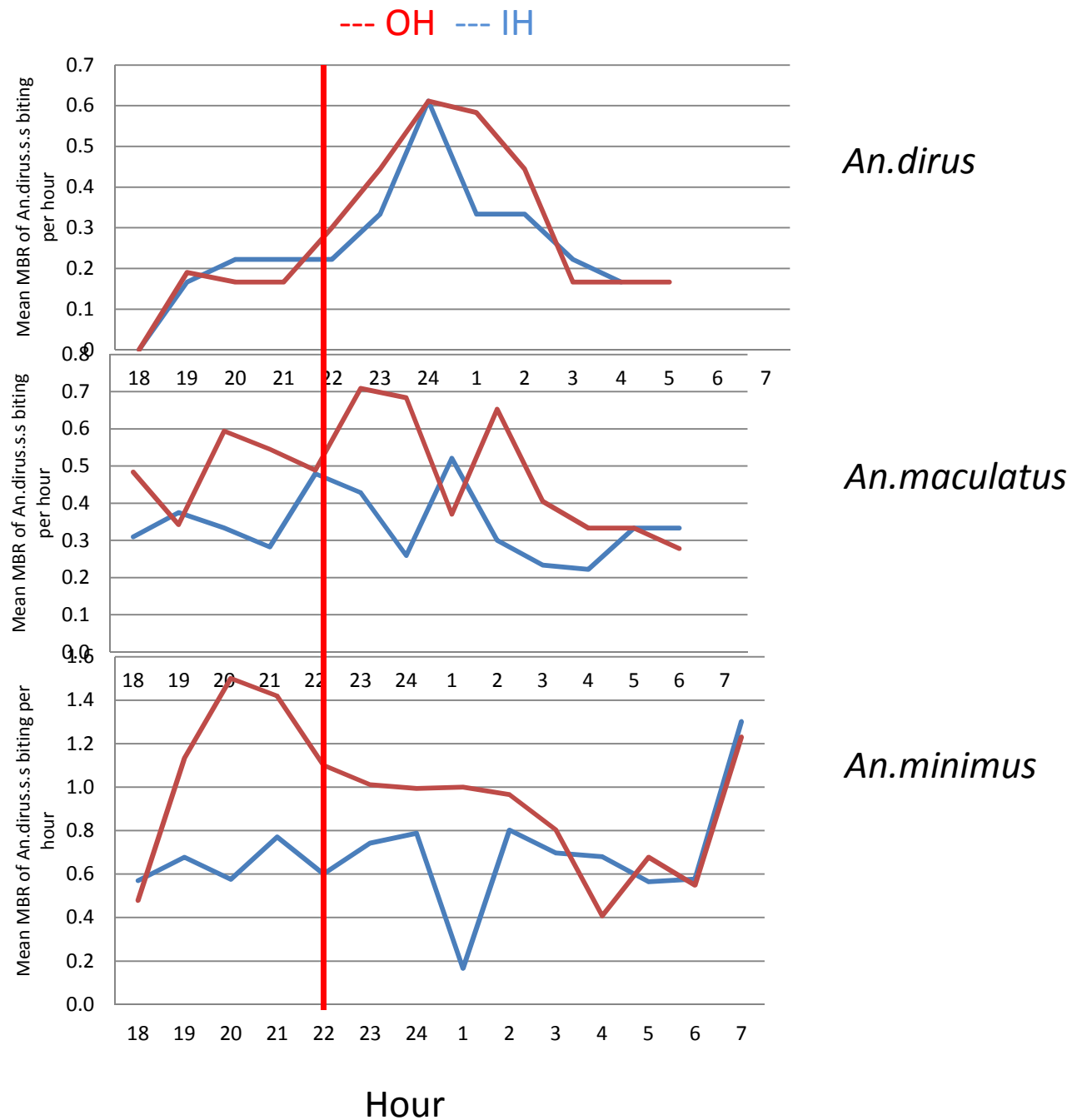
Early biting (before 22H) in Cambodia (collection in 2006)



Vary according to species and locality

Adapted from Durnez et al. 2013, MJ 12:329

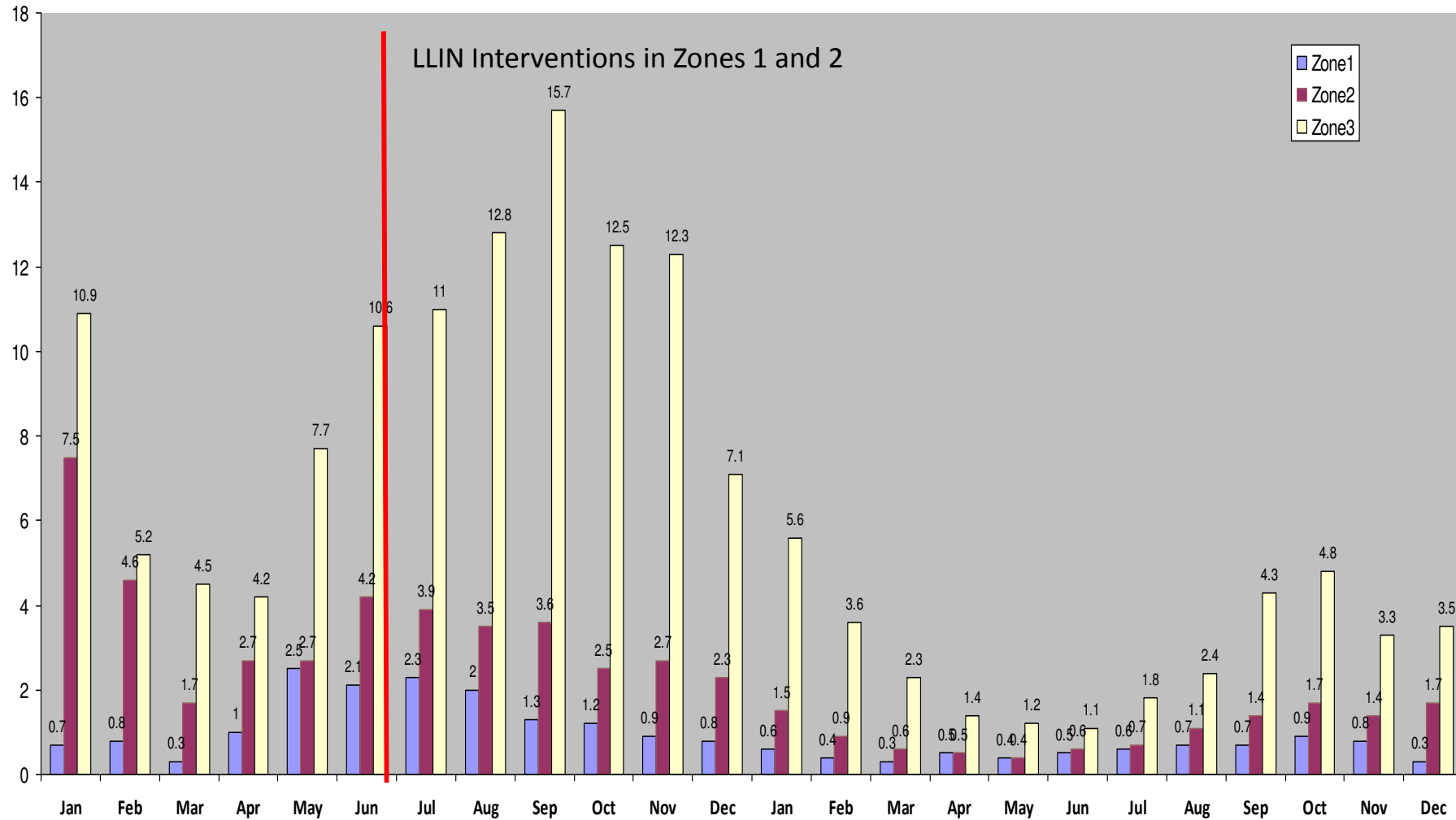
Vector Ecology



The knowledge gap of residual transmission in GMS

- Even recently achieved reductions of malaria transmission and burden with LLINs is of enormous public health value.
- The vector ecology of Animal-feeding and outdoor-feeding (which are usually mutually associated) that allow mosquitoes to minimize contact with insecticides targeted at humans.
- Insecticide contact avoidance and early-exit behaviors that minimize exposure hazard of vectors that feed indoor.
- Vectors related to Artemisinin Resistance parasites (research?).

Example of output - Pf cases per month showing the effect of LLIN interventions in Cambodia

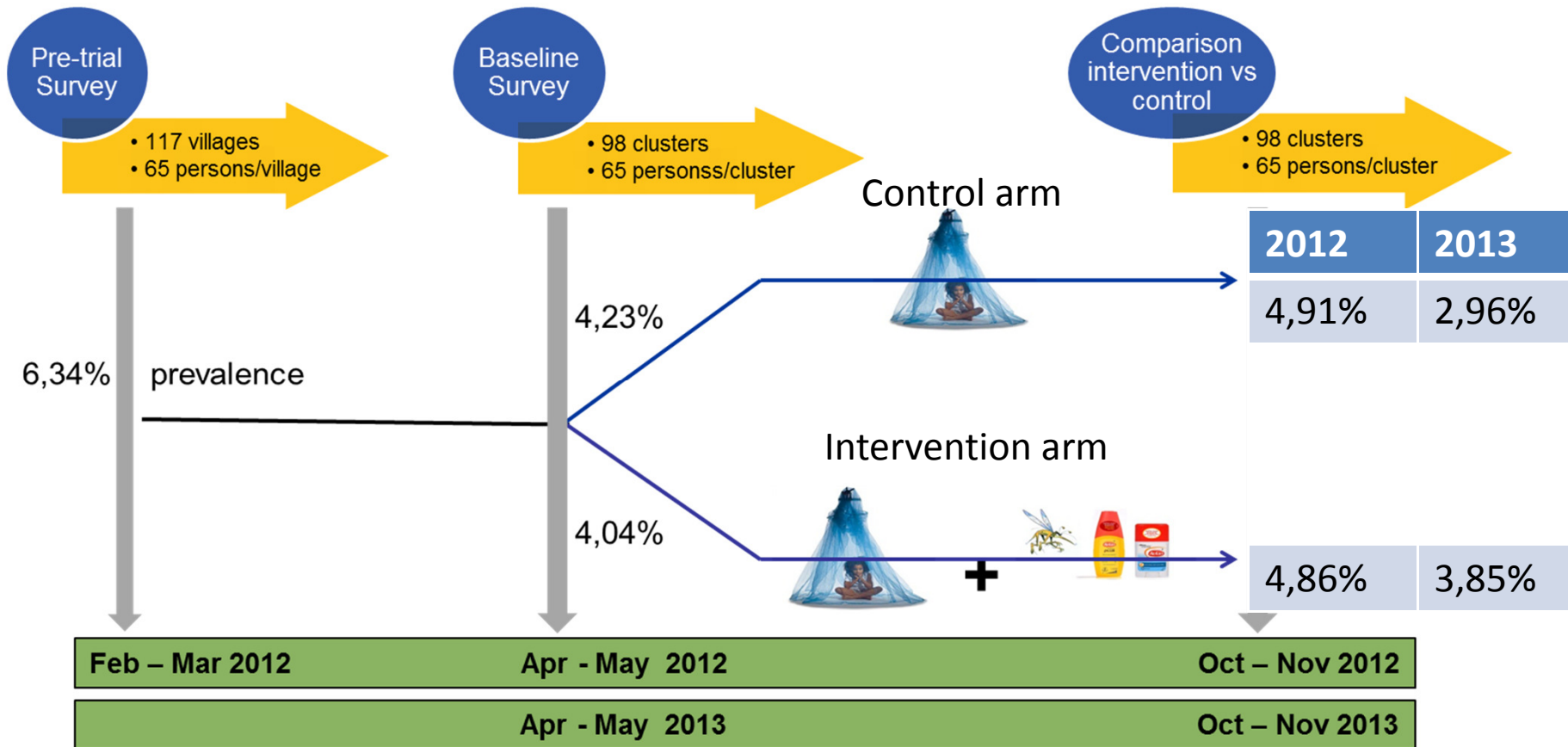


The current Challenge Strategy (1)

To go beyond the current limitations of impact that can be achieved with effective IRS and/or LLINs

- Enhance indoor control measures for adult vectors that often enter houses:
 - Improve LLIN usage (net preference)
 - Be under LLIN while resting, chatting inside the house.
- Extend coverage of vector control measures to target adult mosquitoes beyond houses or even people:
 - Use Repellence
 - Use LLIHNs for outdoor sleeping such as forest workers.
 - Provide forest package to forest worker (LLIHN, Repellence, standby treatment?)
 - Use net, fire to protect livestock
 - Use treated materials (only military)
 - Apply insecticidal sugar baits (research)

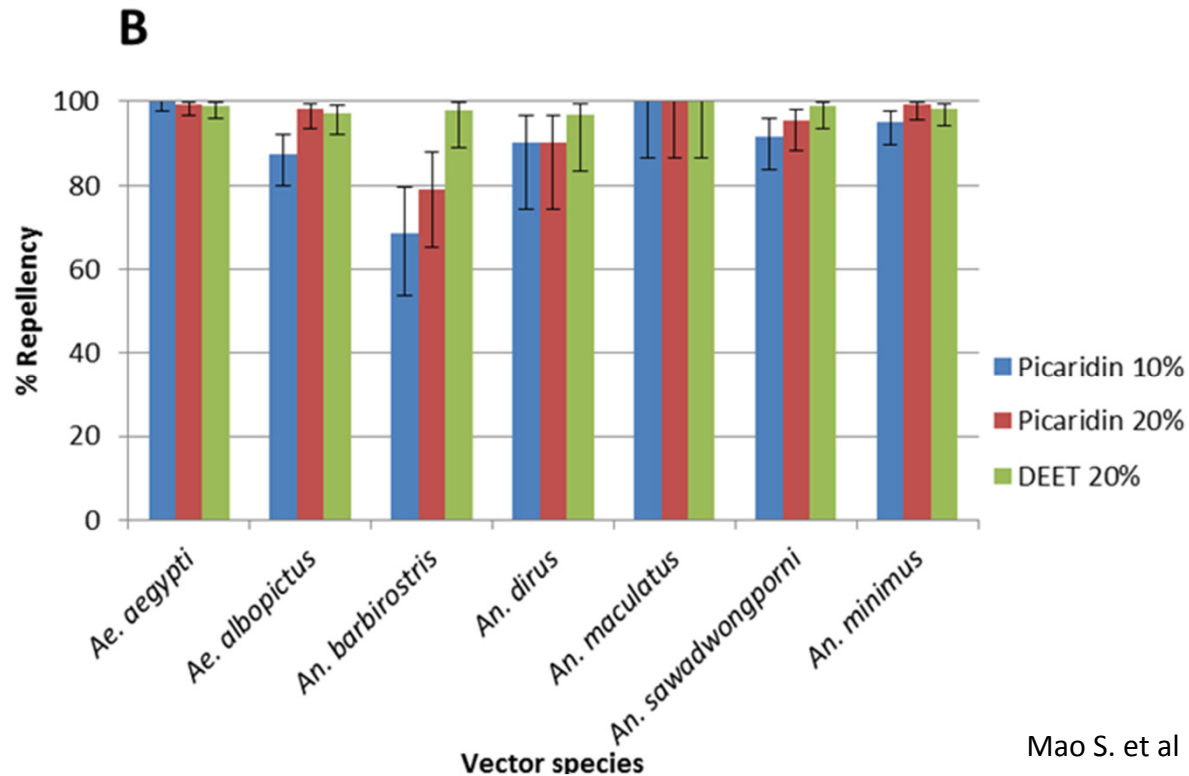
MalaResT project: evaluation of repellents



Conclusion: no significant difference in PCR Plasmodium prevalence between control and intervention arm after one year (2012) and after two years (2013).
 => No **community** protection could be demonstrated.

MalaResT project:

- Repellent used (Picaridin) was effective during 5 hours (>95% protection against vector bites) = **personal protection** against malaria can be expected



- Despite a high acceptance in the community (>90%) and high reported use, 47 to 76%) => low observed daily and consistent use (7 to 15%) . (high alternative use)
- **This explain the low community protection against malaria.**

The current Challenge Strategy (2)

To go beyond the current limitations of impact that can be achieved with effective IRS and/or LLINs

- Target source reduction efforts towards the immature stages of mosquitoes in their aquatic habitats:
 - Environmental management (limitation in some species)
 - Lava control (limit to dengue vector only)
- Reduce the survivorship of vectors:
 - Use Ivermectin (research).
- Block gametocyte transmission:
 - Apply additional primaquine single dose for *P.falciparum* treatment .

The current Challenge Strategy (3)

To go beyond the current limitations of impact that can be achieved with effective IRS and/or LLINs

- House improvement:
 - No evidence on that
- Funding resistance.

The current attempt in the GMS

- To develop/design the effective tools for *P. falciparum* malaria elimination in order to eliminate malaria parasite resistant- GMS country initiative through ERAR.
- ERAR/RAI initiative: provide intense vector control where the artemisinin resistant evidence (Tier 1).
- Need more initiative beyond these- lacking the coordination/guidance → regional and global networks

Thank you for your attention

