



Indications of differential efficacy of chlorfenapyr-based ITNs between sites

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Pyrethroid-chlorfenapyr nets working well – but not equally well everywhere?

Strong recommendation for, Moderate certainty evidence

Pyrethroid-chlorfenapyr ITNs vs pyrethroid-only LLINs (2023)

Pyrethroid-chlorfenapyr ITNs should be deployed instead of pyrethroid-only LLINs for prevention of malaria in adults and children in areas with pyrethroid resistance.

The evidence for an epidemiological impact of IG2s is strong

But there are indications that the benefits over pyrethroid-only nets may be less pronounced in some areas, correlating with high pyrethroid resistance intensity

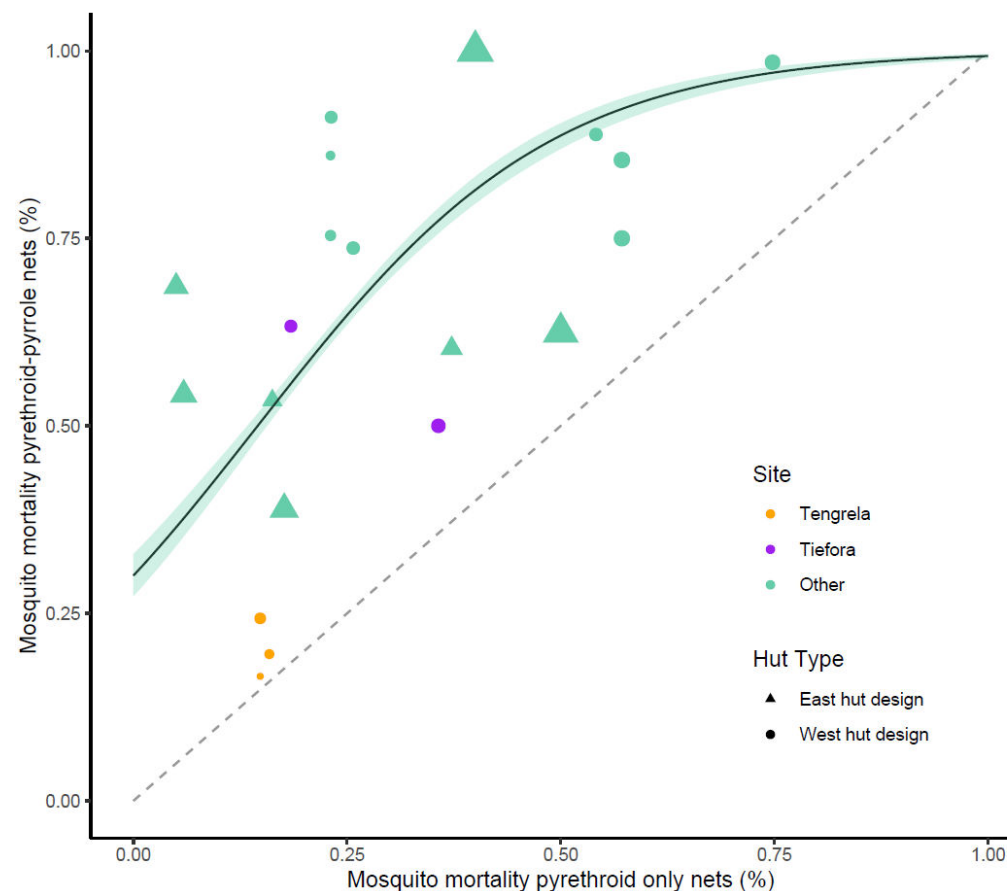
Evidence of differential performance between sites

Experimental hut trial results suggest that the nets may be more effective in some sites than others, even across a short geographical distance

Burkina Faso – a tale of two sites

Tengrela: < 20% mortality with CFP-alpha-cypermethrin nets

Tiefora: added benefit of the chlorfenapyr-based net much more pronounced, though varies with year



Challenger and Churcher, publication in prep

Differential results between sites certainly warrants further investigation

The explanation might lie in the:

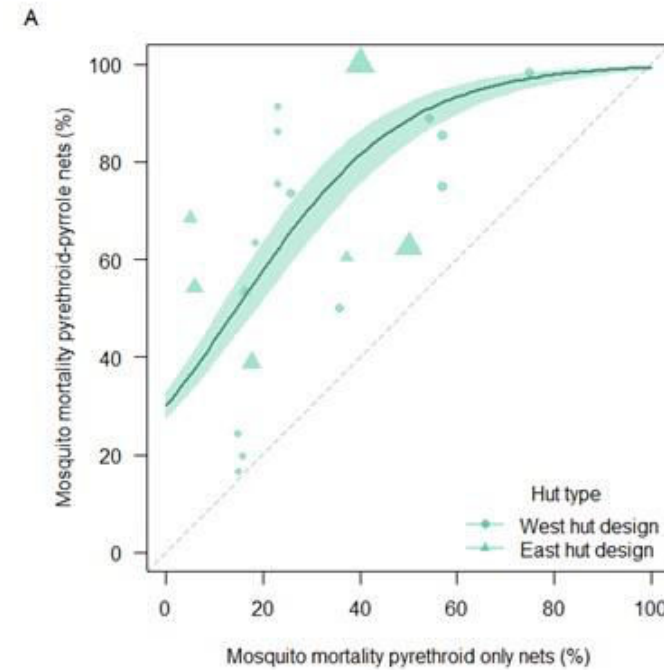
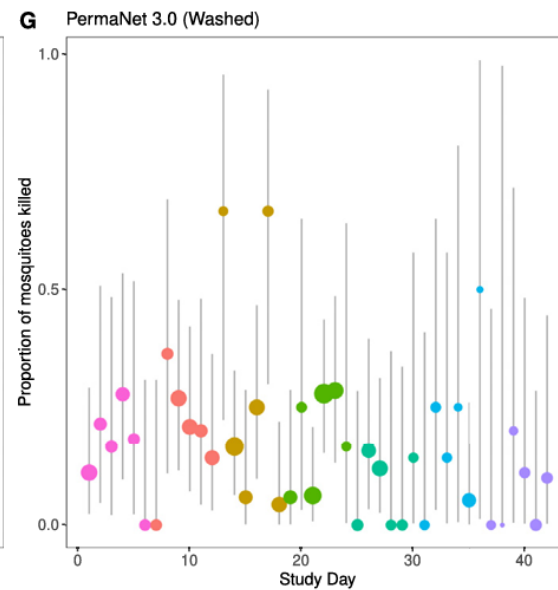
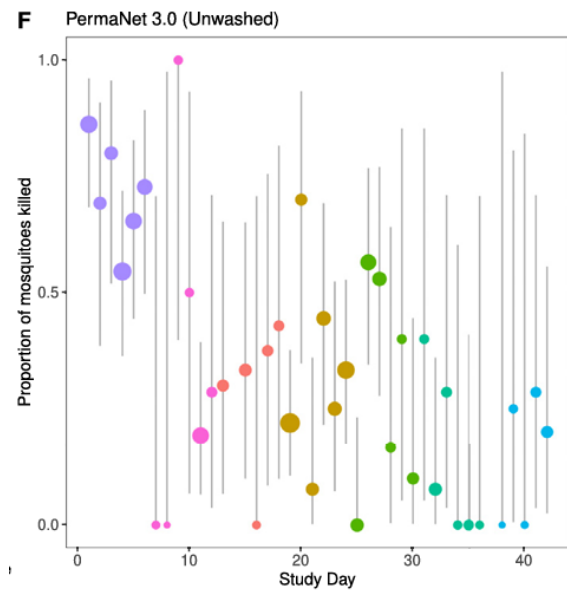
- Methods
- Mosquito populations
- Specific mosquito-product interactions



Experimental huts in CRID, Cameroon

There is a level of variability in EHT data

EHTs used to evaluate ITNs against wild free-flying mosquitoes



Challenger et al, 2023

Churcher, publication in prep

High between-observation variability in mortality is commonly observed

Can we further standardise the methodology?

It's possible the differences in results are due to methodological differences

Reducing variability is essential for collecting more robust entomological data

Need to interrogate and improve the testing methodology for chlorfenapyr and chlorfenapyr-based products

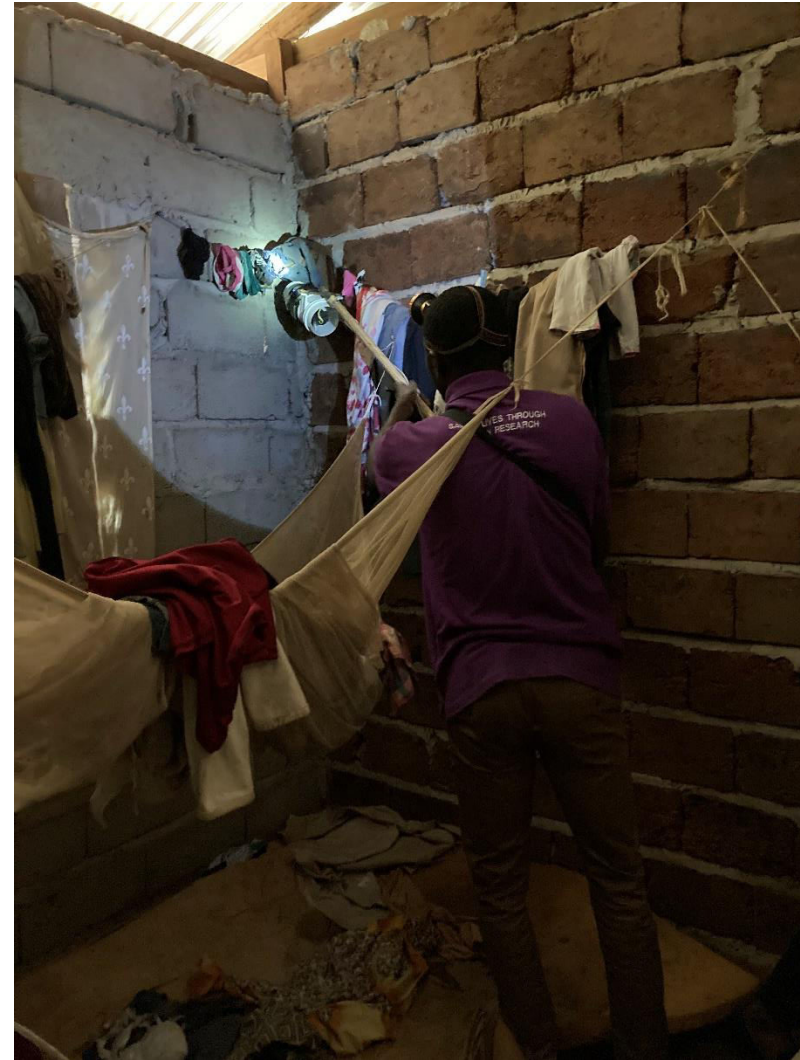


Photo courtesy of Anna Trett

Could insecticide resistance be the explanation?

Performance of dual AI ITNs may be undermined by resistance to one or more of the active ingredients in the nets and/or the interaction between insecticides

There are reports of <98% mortality in a bottle bioassay for chlorfenapyr

The WHO protocol for testing for chlorfenapyr contains specific instructions in testing method:

- Including a susceptible strain to confirm testing conditions correct
- Repeat testing for confirmation
- Follow up investigation



Photo courtesy of LITE

Interactions between pyrethroids and chlorfenapyr

Characteristics of the mosquito populations may be impacting the performance of CFP-alpha-cypermethrin ITNs

Even where there is no resistance *per se*, high intensity pyrethroid resistance could be affecting metabolism of chlorfenapyr in the presence of a pyrethroid, or behavioural response to ITNs



What does this mean for deployment decisions?

- Although it may be that chlorfenapyr-based nets will be more effective in some sites than others, the evidence is not yet strong enough to make decisions on this basis
- Important to continue monitoring for the resistance, given the increasingly widespread deployment of chlorfenapyr-based interventions



Thank you for your attention

