

Long-lasting insecticide treated blanket for protection against *Anopheles arabiensis* and *Culex quinquefasciatus*: an experimental hut evaluation in Tanzania

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Introduction

- ITNs/LLINs and IRS have been proven effective against mosquitoes and disease transmission
- There have been efforts to rapidly scale up bed nets in endemic areas
- Despite the increase in LLIN ownership regular usage by owners has not been guaranteed and in emergency situations and nomadic groups LLINs and IRS become impractical
- Blankets/lightweight sheets are likely to be used all year-round
- We determined efficacy of insecticidal blankets against free flying *Anopheles arabiensis* and *Culex quinquefasciatus* in experimental huts

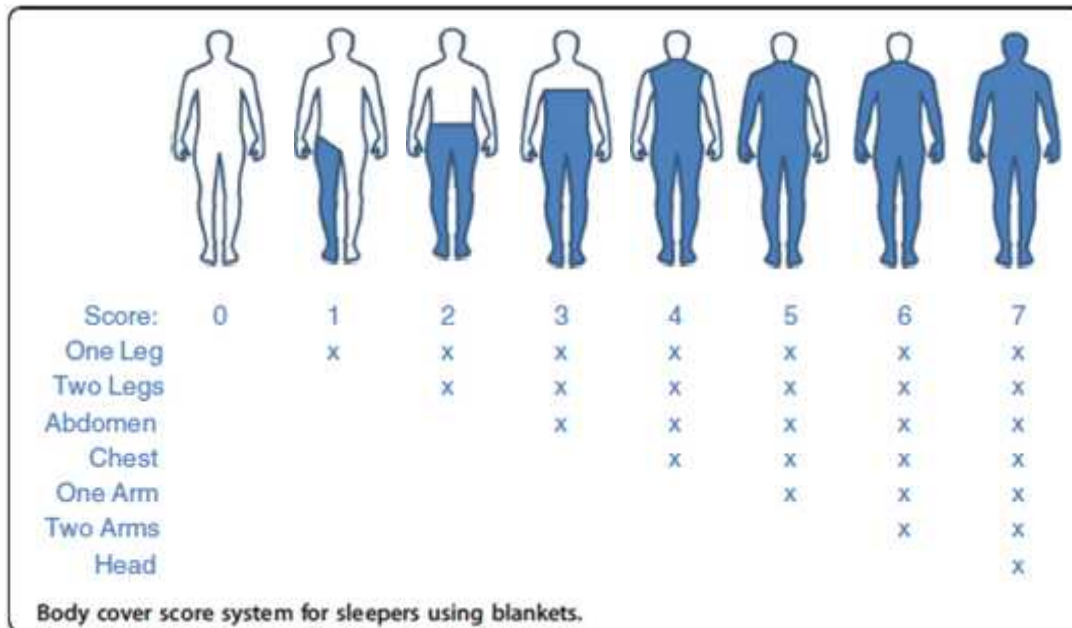
Methodology

- Factory treated blankets were given by manufacturer, Olyset net used as positive control
- Conventional blankets were individually treated with 500mg/m² permethrin EC
- Washing and testing protocols were modified from WHO guidelines for LLINs
- 3 minutes ball tests on blankets recording knock-down and mortality
- Arm-in- cage bioassays were done to determine levels of repellence



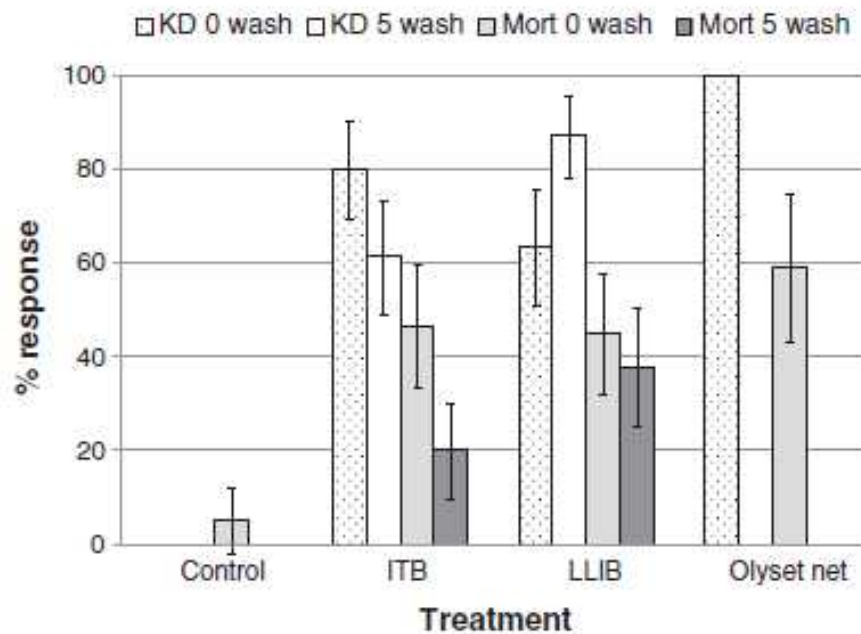
Methodology...

- Experimental hut study in Lower Moshi, a resistant *An. arabiensis* area
 - Control (C) blankets (UN, W)
 - Factory treated (LLIB) blanket (UN, W)
 - Conventionally treated (ITB) (500mg/m²) blanket (UN, W)
 - Olyset bed net

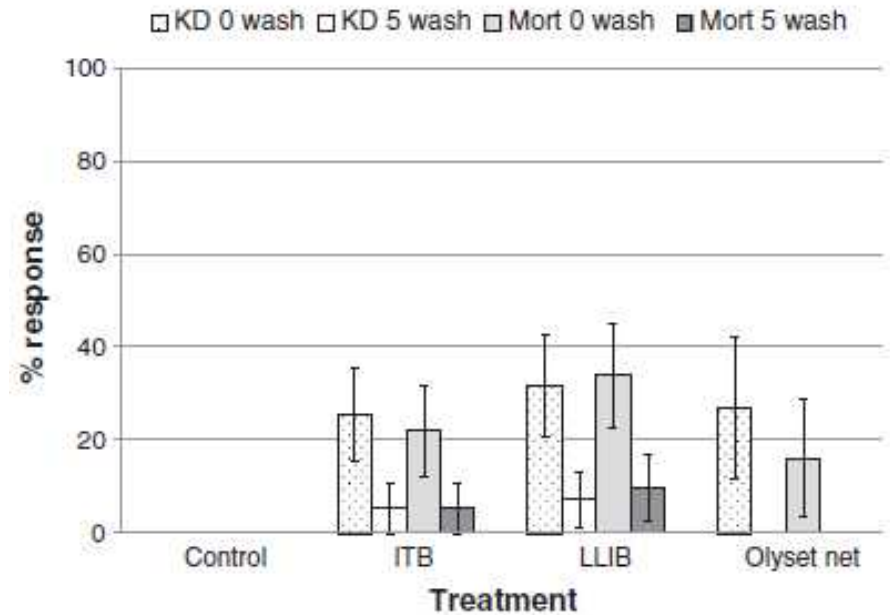


Results

Knockdown and mortality of treatments against *An. gambiae* s.s.



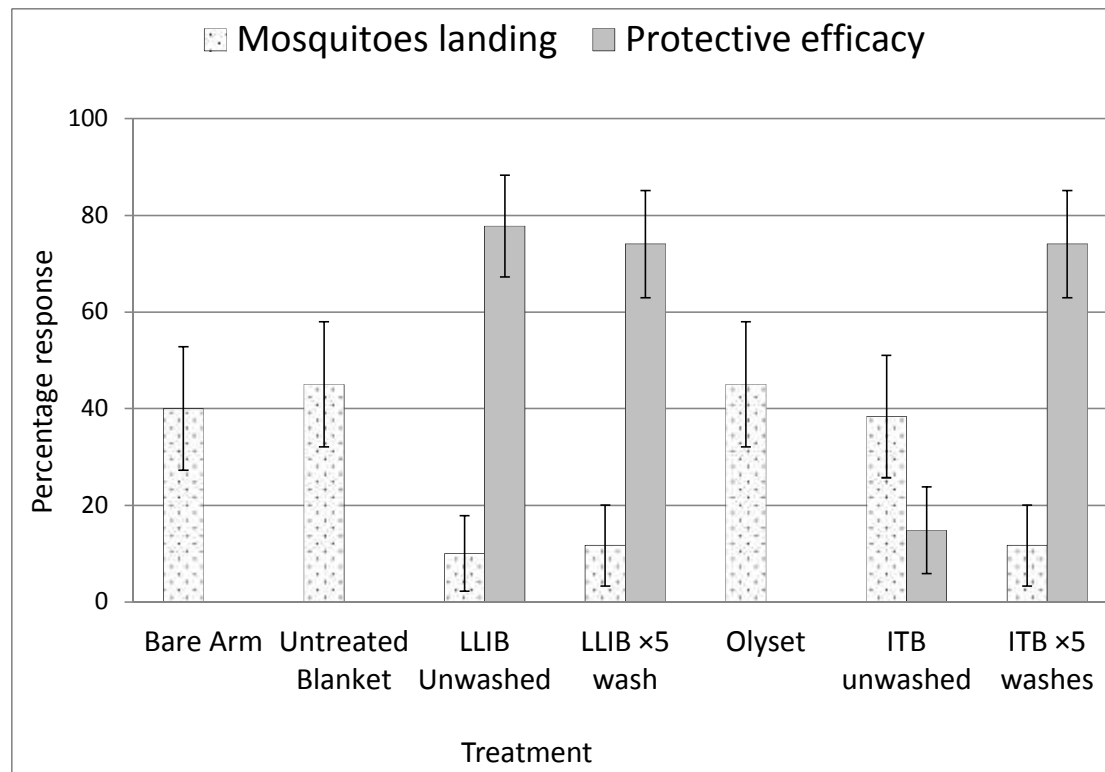
Knockdown and mortality of treatments against *An. arabiensis*



Low knockdown and mortality effect recorded against partially resistant *An. arabiensis* in ball assays

Results...

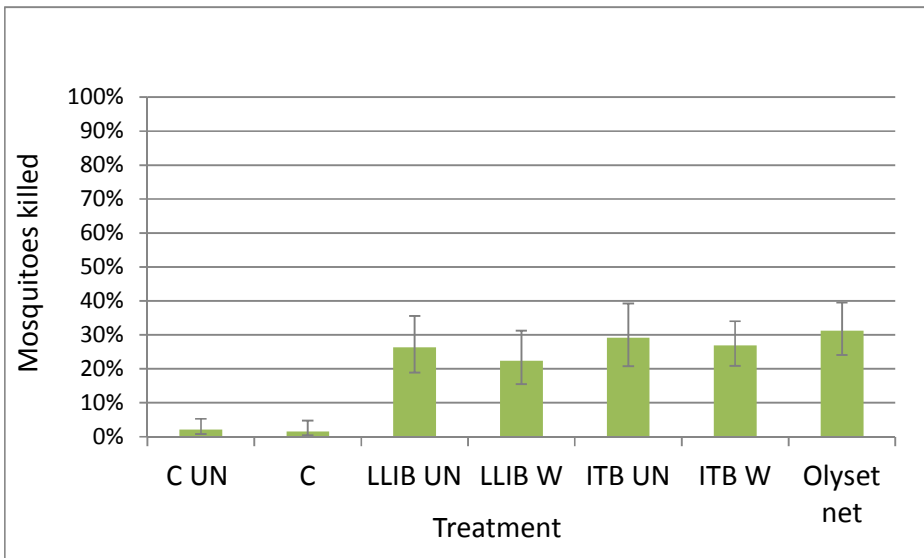
Landing and protective efficacy of blanket and bed net treatments against *An. gambiae* s.s. in laboratory



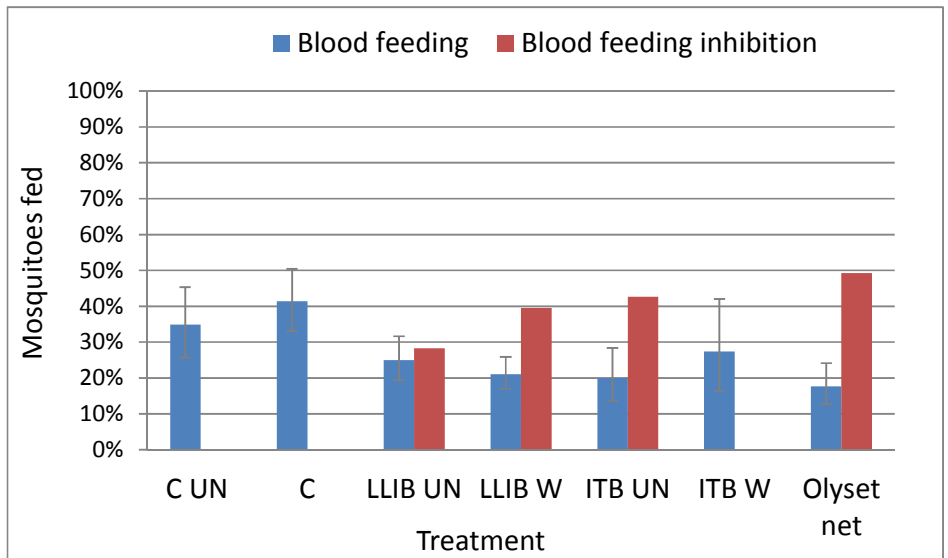
No protection against Olyset net on freely landing mosquitoes

Results...

Overall mortality of free flying *An. arabiensis*



Blood feeding rates of free flying *An. arabiensis*

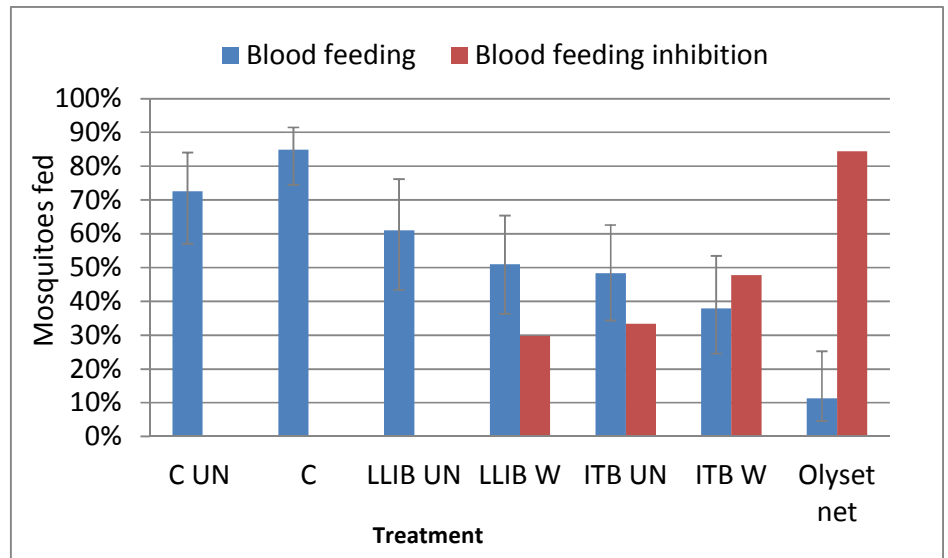
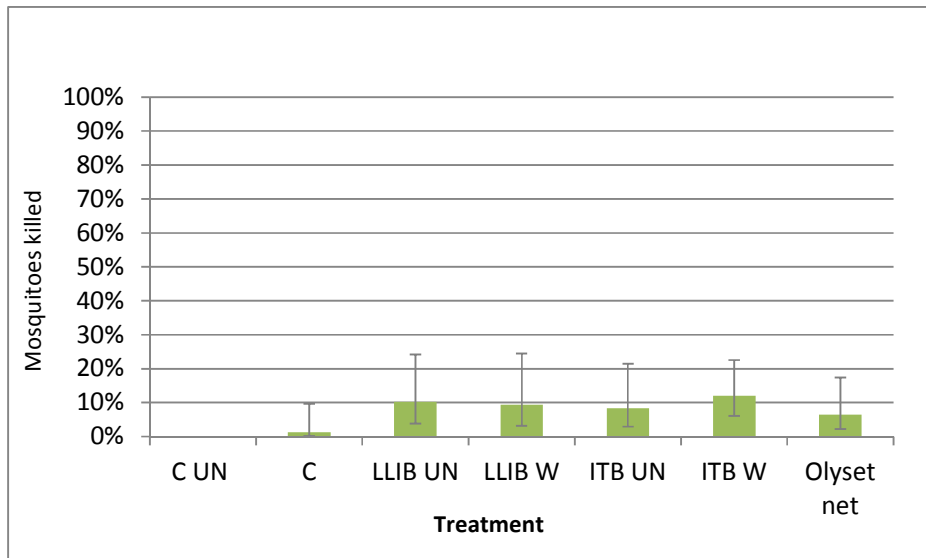


Blankets, like Olyset nets successfully killed *An. arabiensis* and protected individuals from mosquito bites

Results...

Mortality of free flying *Cx. quinquefasciatus*

Blood feeding rates of free flying *Cx. quinquefasciatus*



Blankets were not effective in killing but reduced blood feeding by *Cx. quinquefasciatus*

Conclusions

- Insecticide treated blankets provided a barrier against host seeking mosquitoes and induced mortality rates comparable to Olyset net
- When well used insecticidal blankets may complement bed net usage and provide considerable protection even in areas of partial pyrethroid resistance
- Insecticidal blankets were not effective in killing the robust, nuisance biting *Culex quinquefasciatus*
- To maximize the value of impregnated blankets a combination of insecticides and repellents could be considered

Acknowledgements

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**Thank you all for
listening**