

Insecticide treated screening for **unimproved** housing for equitable community malaria control

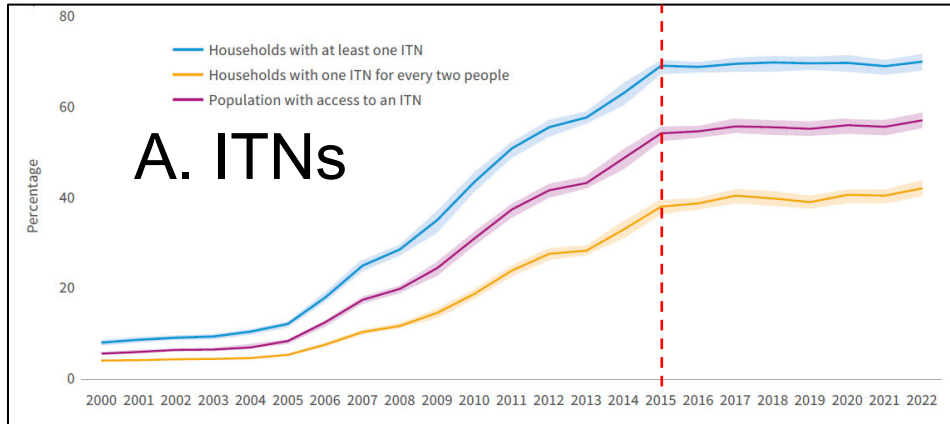


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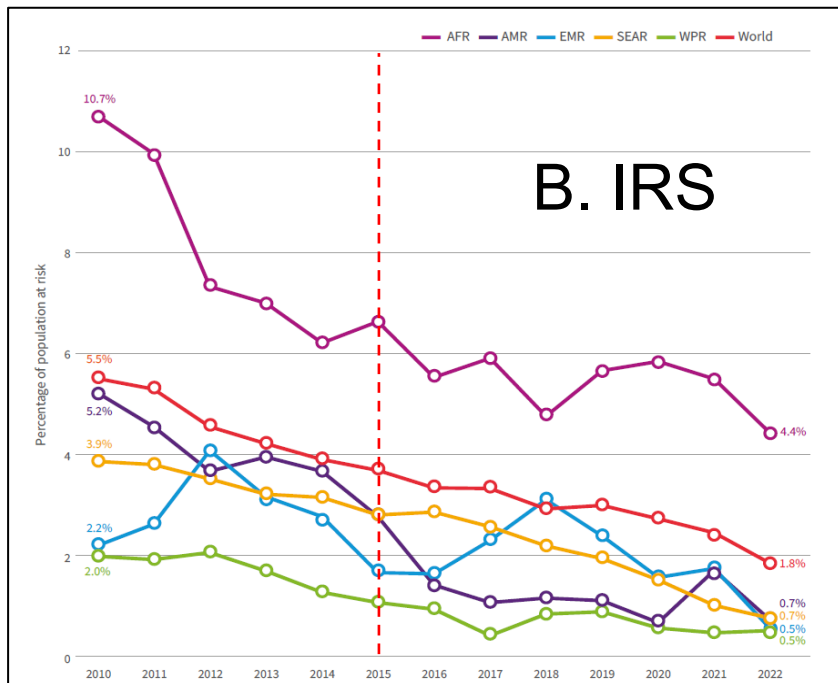
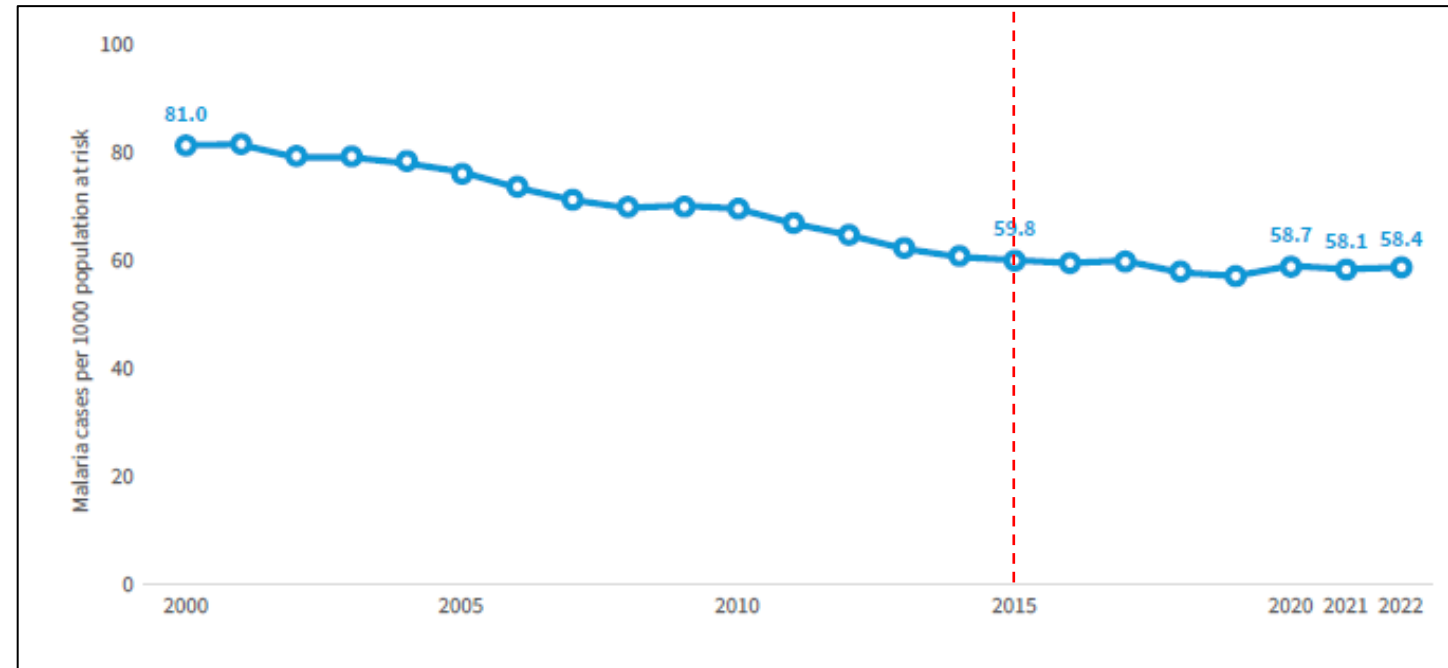
19th Annual RBM Vector Control Working Group Meeting

April 16th, 2024

Global malaria resurgence & vector control coverage post 2015



C. Global malaria case incidence

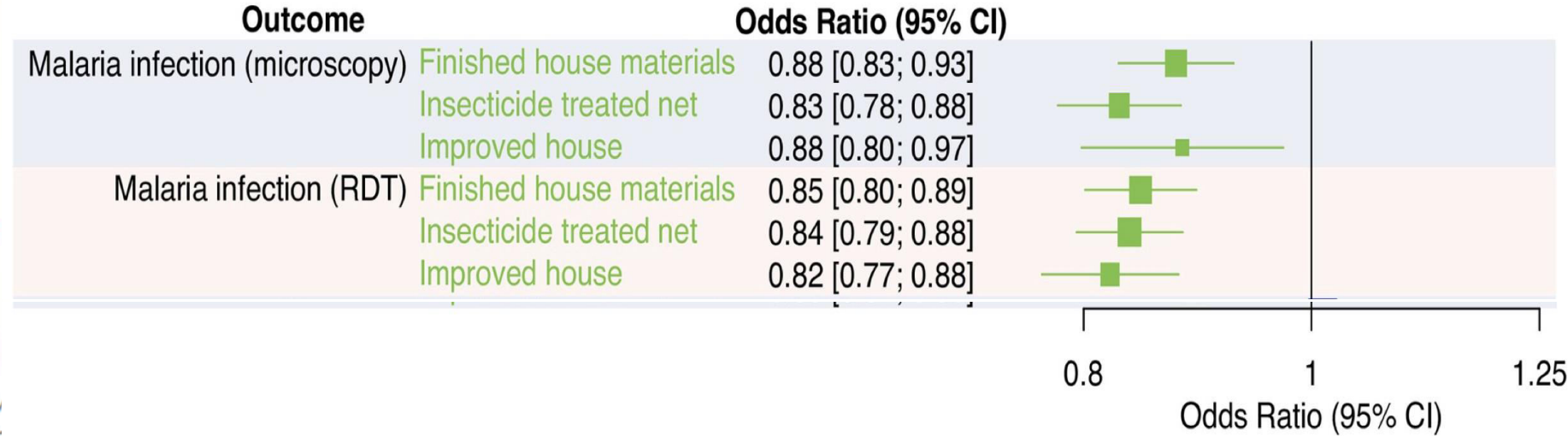


Source: World Malaria Report, 2023

House screening works as well as ITNs to prevent malaria



Lindsay *et al.* 2002 *Trends Parasitology*
 Jatta *et al.* 2018 *Lancet Planet Health*



Tusting *et al.* 2020 *Plos Medicine*

Afrotropical *Anopheles* mainly bite indoors at night

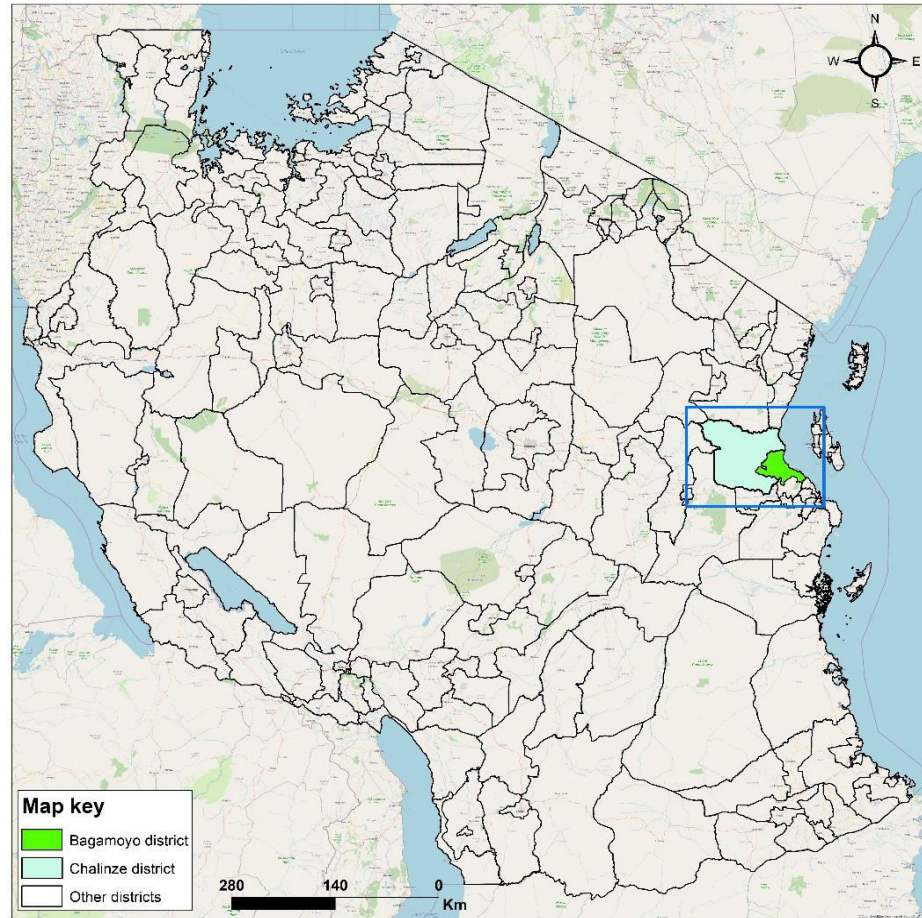
Mosquito house entry may be reduced by

- Closed eaves
- Screened windows
- Well-fitted doors

Insecticide Treated Screening (ITS) : Insecticide Treated Eave Nets (ITENs) and Window screens (ITWS) for unimproved houses



Pilot trial flow and design



Chalinze district

Odufuwa *et al. Trials* (2022) 23:578

225 households recruited per arm

Household randomization

ITS (eaves, windows and wall holes)

Standard of care

Primary endpoint

malaria prevalence (PCR) at end of long rains

all household members >6 months old

ITS installed in control houses at the end of trial

Baseline characteristics

Factor	Untreated households	ITENS & ITWS
Number of households	214	207
Number of participants	955	918
Age-group of head of HH		
18-24	11 (5.2%)	9 (4.6%)
25-49	110 (52.1%)	90 (46.4%)
50-above	90 (42.7%)	95 (49.0%)
Sex of HH		
Male	162 (76.8)	139 (71.7)
Female	49 (23.2)	55 (28.4)
Household size		
1-2 members	47 (22.0)	49 (23.7)
3-5 members	108 (50.5)	103 (49.8)
6 and above	59 (27.6)	55 (26.6)
Education of head of HH		
No formal education/pre-primary	44 (20.6%)	38 (18.4%)
Primary	155 (72.4%)	154 (74.4%)
Secondary/tertiary	15 (7.0%)	15 (7.3%)
Proportion of population access to nets		
No	117 (54.7%)	111 (53.6%)
Yes	97 (45.3%)	96 (46.4%)
Primary material of house roof		
Grass/banana leaves/Thatch Dung/mud/soil	19 (8.9%)	6 (2.9%)
Iron sheets/Tin cans	195 (91.1%)	201 (97.1%)
Primary wall material		
Sticks/Grass/iron sheet/Mud	182 (85.1%)	178 (86.0%)
Burnt/cement bricks	32 (15.0%)	29 (14.0%)
Primary floor material		
Earth/sand/mud	154 (72.0%)	134 (64.7%)
Cement	60 (28.0%)	73 (35.3%)
Socioeconomic status		
Lowest	50 (23.4%)	33 (15.9%)
Low	41 (19.2%)	42 (20.3%)
Middle	40 (18.7%)	46 (22.2%)
High	40 (18.7%)	44 (21.3%)
Highest	43 (20.1%)	42 (20.3%)

Balance between arms

Installation was fast, feasible and acceptable

Variables	Arithmetic mean (95% Confidence Interval)
N=206	
Installation time (hours and minutes)	01:04 (00:01 - 04:26)
Average fabric per household (metres)	
Total	29.5 (1.6 – 64.2)
Eaves	24.1 (0.8 – 60.2)
Windows	3.4 (0.3 – 17.2)
Overall wall holes per household	2.0 (0 – 20.5)
Willingness to purchase material for self-installation	% (n)
Yes	95.3 (181/190)
No	4.2 (8/190)
Don't know	0.5 (1/190)

ITS trend towards lower malaria prevalence

		Unadjusted		Adjusted for covariates	
	Prevalence % (n/N)	Odds Ratio	P-value	Odds Ratio	p-value
Control	28.0 (65/232)	1.00		1.00	
ITS	19.9 (50/251)	0.66 (0.34 - 1.28)	0.214	0.70 (0.36 - 1.36)	0.293

Entomological data in mathematical models indicate substantial improvements relative to pyrethroid PBO ITNs

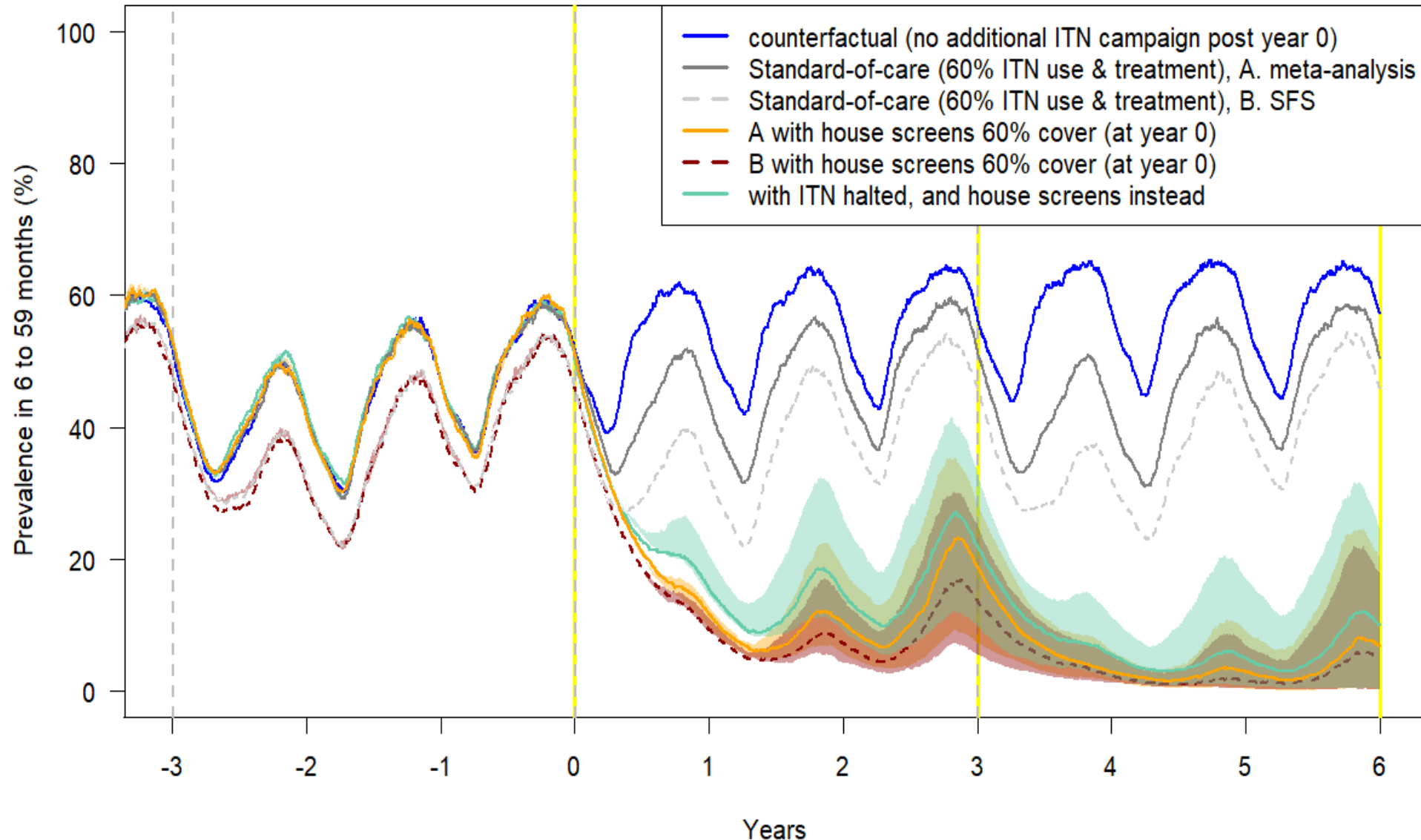


Figure by: Ellie Sherrard-Smith



Conclusion and next steps

- ITS was feasible and acceptable
- Cost in line with ITNs (\$1.29 per person year)
- The direction of effect favours ITS
- The trial was inconclusive
- Trial was underpowered due to community mistrust during COVID
 - Drop outs [73 (36%) in control & 54 (28%) in treatment]
 - Refusals [88 (25%) in control & 122 (30%) in treatment]
- Mathematical modelling of SFS data indicates likely benefit over ITNs
- Cluster randomised-controlled trials required

Benefits of insecticidal house screening

- Potential additional tool for vector control tool in unimproved houses
- Use for insecticide resistance management
- Cost effective and equitable
- Does not require daily compliance





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