

# Cost-effectiveness of insecticide treated wall liner for malaria prevention in rural western Kenya

Donald S. Shepard<sup>1</sup>, Elizabeth Glaser<sup>1</sup>, George Olang<sup>2</sup>, Nabie Bayoh<sup>2</sup>, Meghna Desai<sup>2</sup>, Aggrey Kihombo<sup>3</sup>, Frank Odhiambo<sup>4</sup>, John Gimnig<sup>4</sup>, Mary J Hamel<sup>4</sup>, Vincent Were<sup>2</sup>, Peter Otieno<sup>2</sup>, Kayla Laserson<sup>2</sup>, Simon Kariuki<sup>2</sup>

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*1 Brandeis University, Waltham, MA, United States,*

*2 Kenya Medical Research Institute (KEMRI), Kisumu, Kenya,*

*3 Mzumbe University, Mzumbe, Tanzania,*

*4 Centers for Disease Control and Prevention, Atlanta, GA, United States*



# Introduction

- **Insecticide Treated Wall Liner (ITWL) can supplement insecticide treated nets (ITN).**
- **ITWL: durable polyethylene based textile impregnated with deltamethrin providing sustained release for up to 4 years.**
- **This study estimates the cost effectiveness: ITWL plus ITN vs. ITN alone.**
- **It identifies key policy questions for research and scale up.**

# Insecticide Treated Wall Line (ITWL)

Home structure within a family compound in the study area



ITWL is a mesh-like material, impregnated with deltamethrin



Insecticide Treated Wall Liner (ITWL)



The study sites are 12 villages in Asembo and Gem districts, Nyanza Province, Kenya.



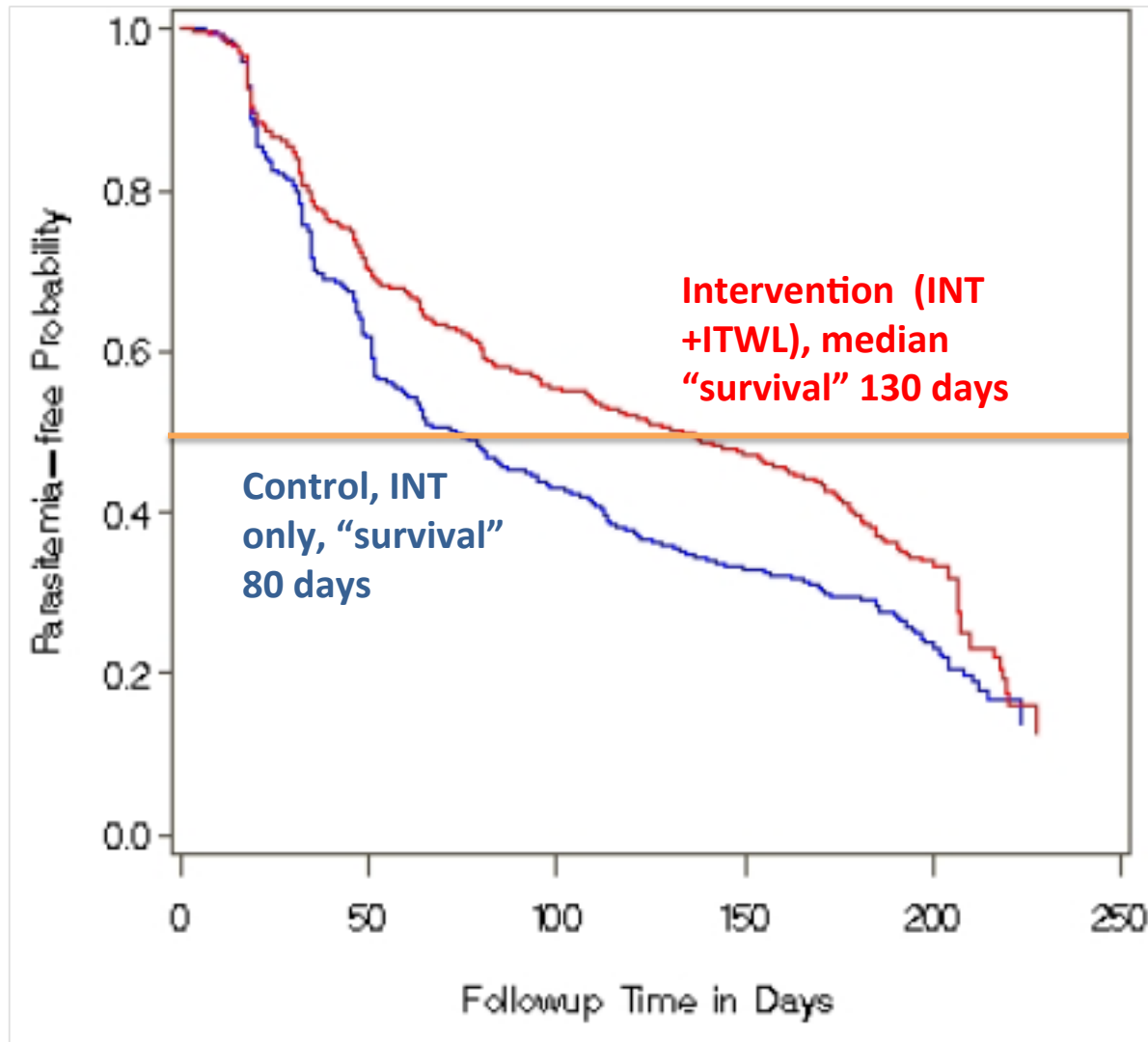
The liner is secured to the walls of a mud hut with nails and a plastic washer

# Background



- This cost effectiveness study builds on an efficacy study of ITWL (Gimnig, 2011).
- Gimnig’s study consisted of a 6-month cluster randomized trial from June to December 2010 in 12 rural villages in Asembo and Gem districts,
- Nyanza Province, western Kenya.
- The trial enrolled 1,592 children aged 6 months through 11 years from 555 randomly selected compounds.
- Control villages had only ITN, while experimental villages had ITN and ITWL.

# Kaplan-Meier Curve



Source: Gimnig (2011)

# Methods

- Economic cost of ITWL assessed by line-item and function.
- Program costs in 2010 prices calculated as the sum of products of the unit costs and quantities for each component
- All direct costs increased by 23% to reflect overhead costs at the parent institution.
- Longer term effectiveness modeled from literature.

# Results

## ITWL effectiveness during trial (Gimnig, 2011)

- 107 infections averted per 100 children years
- Overall adjusted protective efficacy (aPE) of 38%
- aPE for ages <5 years was 31%,
- aPE for ages 5-11 years was 42%
- 63 clinical cases averted per 100 children years.

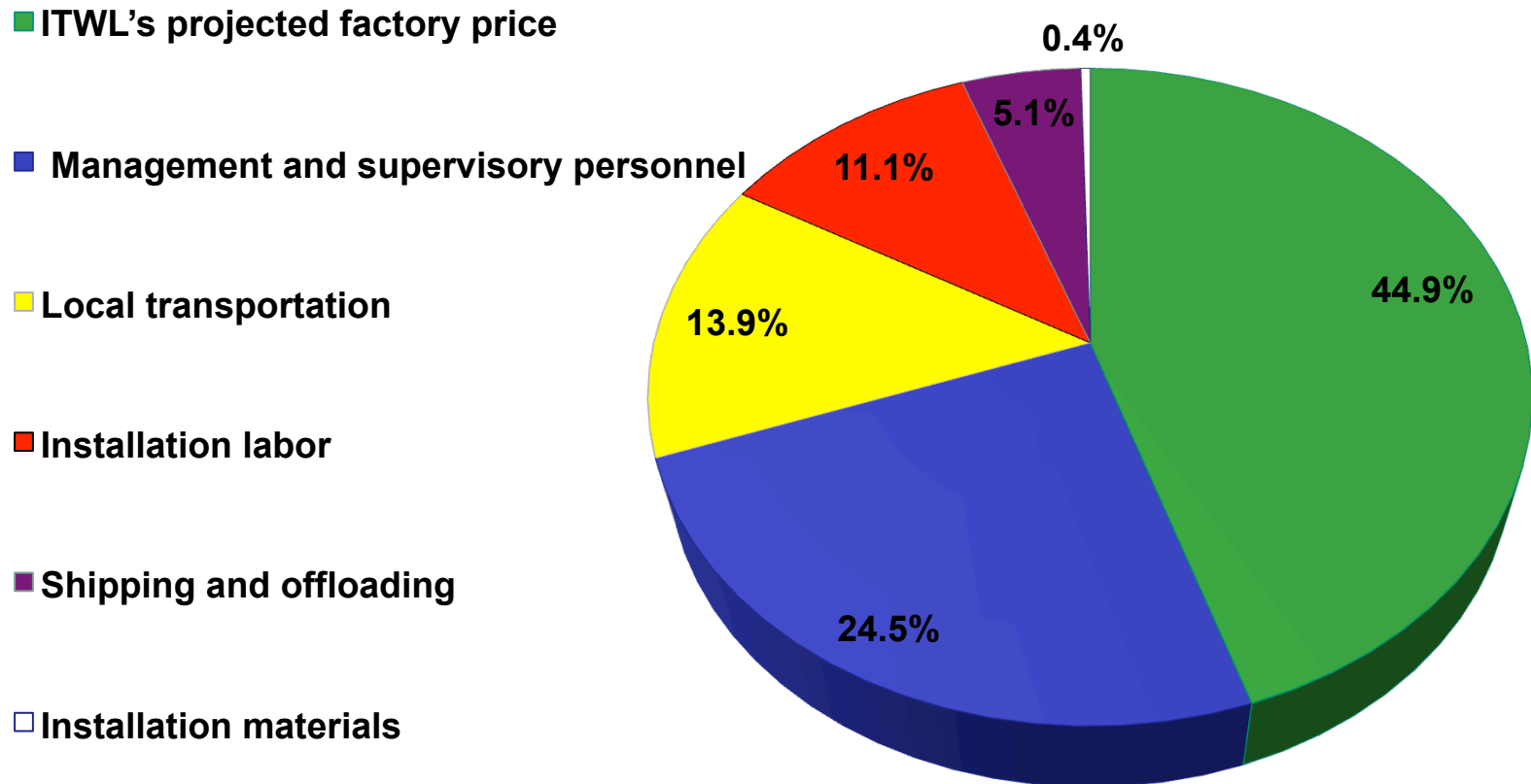
## ITWL Costs

- ITWL overall costs per person covered was US \$64.23 or \$6423 per 100 persons.

# Program costs

Program costs per person covered (in 2010 prices) were  
**US \$64.23 or \$6,423 per 100 persons**

Figure 2. Breakdown of ITWL program costs

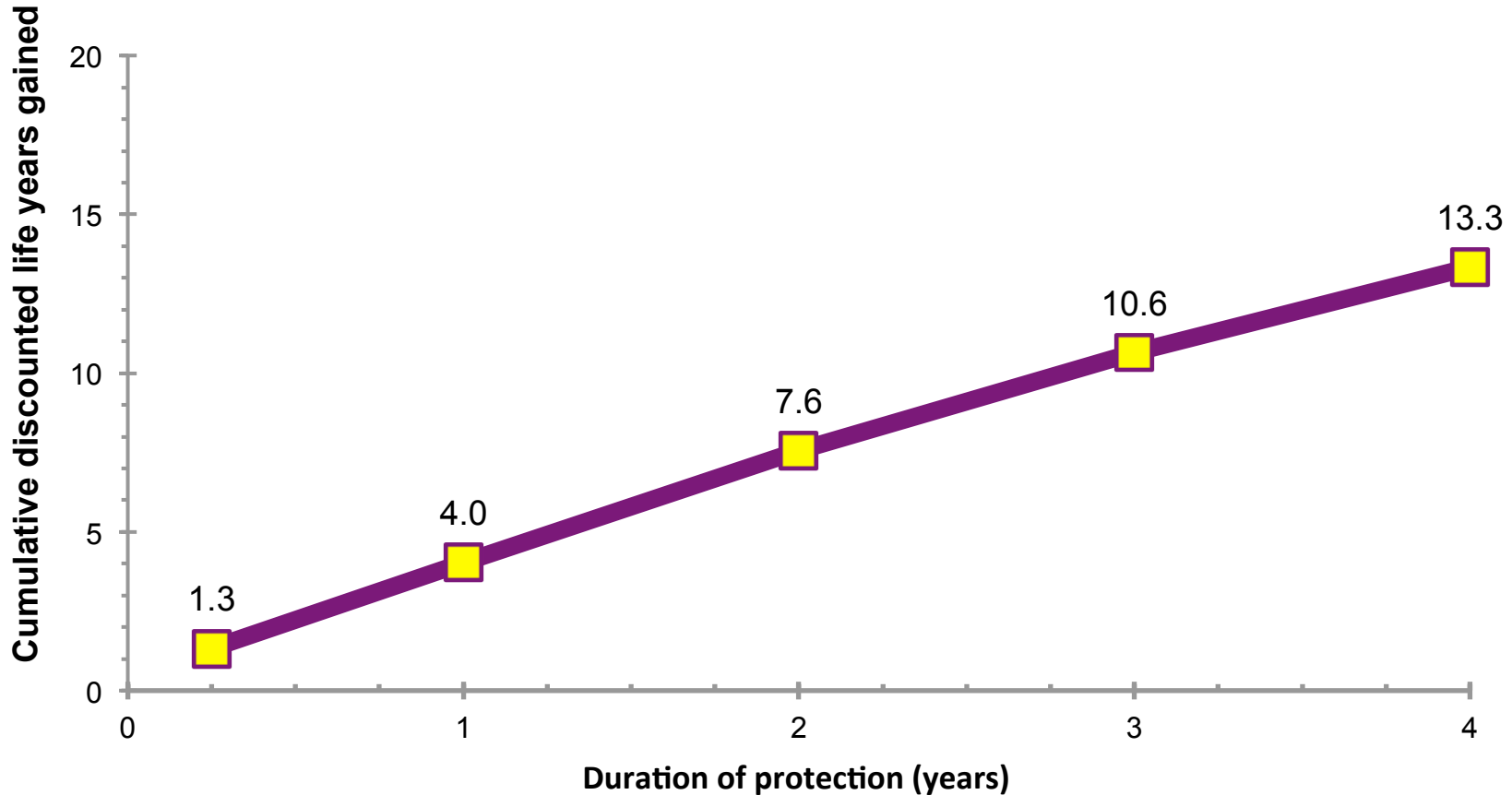




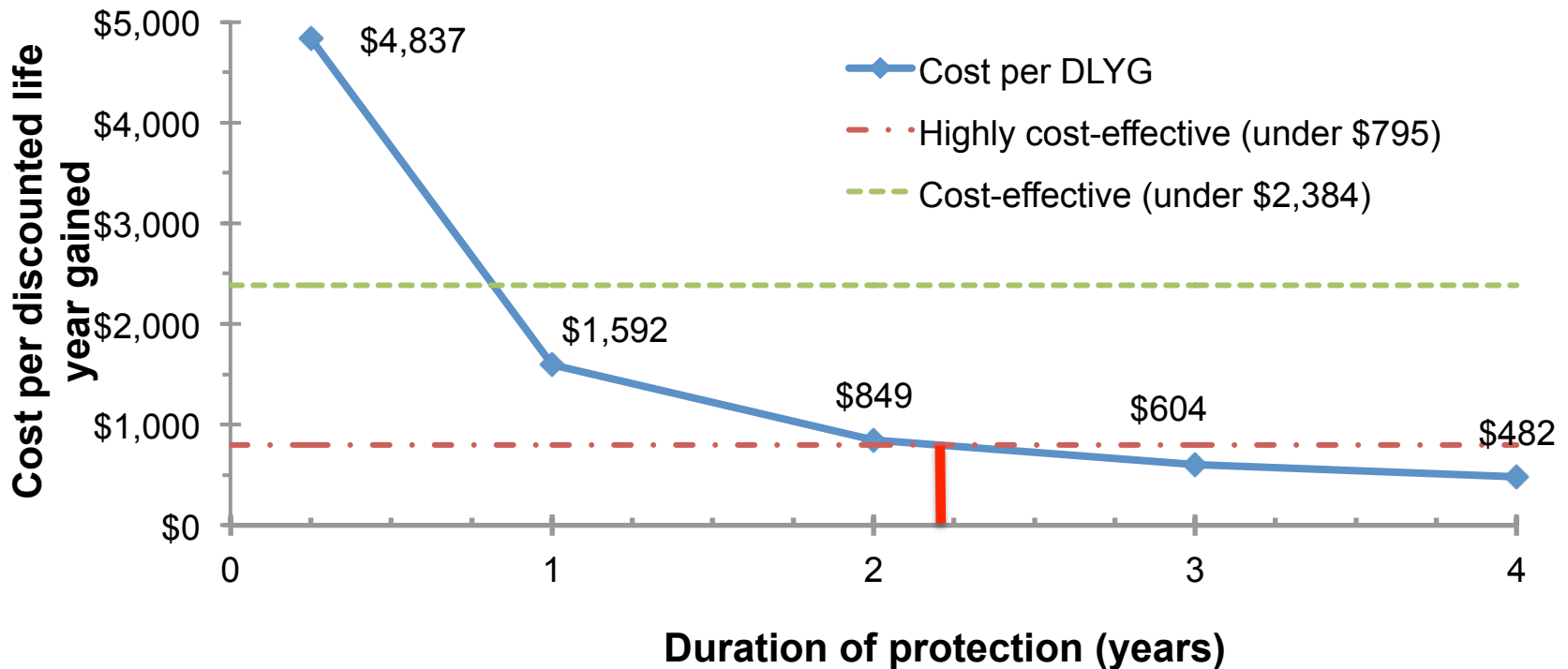
# Longer term projected results

- Cumulative discounted life years gained (DLYG) per 100 persons were 1.3 over trial period (average period at risk, 3 months).
- 13.3 cumulative DLYG through year 4

Figure 4. Benefits of providing wall liner to 100 people



# Cost-effectiveness of wall liner for alternative durations of protection



- Kenya's per capita GDP in 2010 was US\$795.
- WHO considers interventions with cost-effectiveness ratios below a country's GDP highly cost-effective.
- As long as ITWL remains effective for at least 2.2 years, it will be highly cost-effective.

# Discussion

- ITWL becomes considerably more cost-effective as duration of protection grows to 4 years
- ITWL may provide a greater benefit to older children than younger, as older children are less likely to sleep under ITN

# Limitations

- Only 6 months of data available from the underlying efficacy study
- Efficacy was not measured in persons age 12 and above.
- ITWL had no commercial sales at time of the study evaluation, so prices are projections

# Conclusions

- The cost effectiveness of ITWL as a supplement to baseline ITN depends on useful life of ITWL.
- If ITWL provides protection for at least 2.2 years it would be highly cost-effective.
- If substantial “moral hazard” occurs where recipients of ITWL reduced use of ITN, net benefits would be reduced and perhaps eliminated.
- Prospective trials comparing ITWL to IRS and longer term follow up are key for informed policy.
- 3-year study in Tanzania being planned now.

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# References

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