TRaC Summary Report

Mozambique (2009): Malaria Prevention TRaC Study Evaluating Mosquito Net Use Among Caregivers of Children under the Age of Five in Maputo, Inhambane and Zambezia Provinces. First Round.

The PSI Dashboard

Maputo, Inhambane, and Zambezia Provinces, Mozambique
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Summary

Background & Research Objectives

The primary purpose of this study was to estimate key mosquito net use indicators and identify the determinants of mosquito net use. Findings from this study have been used to inform PSI/Mozambique's malaria prevention interventions and information campaigns in order to ensure greatest impact. Specifically, the research objectives were to:

1. Assess the levels of ownership and use of mosquito nets;
2. Determine the target population's opportunity, ability and motivation to use mosquito nets;
3. Assess the current levels of exposure to malaria prevention activities;
4. Establish a baseline for the future evaluation of PSI/Mozambique interventions ; and
5. Establish a baseline for universal coverage indicators.

Description of Intervention

To support the National Malaria Control Program, PSI/Mozambique implements a Malaria project with the primary purpose of increasing the use of LLIN and, ultimately, reducing the morbidity and mortality caused by malaria. With financial support from USAID/PEPFAR/PMI and the Dutch government, PSI/Mozambique implements the following activities: 1) LLIN distribution campaigns to children under the age of five; 2) LLIN distribution to pregnant women during pre-natal care; 3) LLIN distribution to orphans and vulnerable children (OVC) and people living with HIV and AIDS (PLWHA); 4) development and distribution of information, education and communication materials (IEC); and 5) training of activists from partner non-governmental organizations (NGO). At the end of 2009, PSI Mozambique will implement a communication campaign targeting caregivers of children under the age of five to increase use of LLIN for vulnerable groups. Findings from this study were used to inform this communication campaign as to ensure adequate messages targeting the key determinants of net use.

Methodology

This study used a stratified multi-stage cluster design, resulting in a probability sample that produced monitoring estimates at the provincial level, for each of the provinces selected. The sample was drawn from the master sample for the 2007 census and with support from the National Institute of Statistics (INE). Using the number of household per enumeration area, EAs in the first stage of sampling were selected with probability proportional to size (PPS). The sample was distributed proportionally to urban and rural strata within each province. Within each enumeration area, a listing of households was created from which 20 households were selected with equal probability. In the selected households, all eligible women (mothers or caregivers of children under five) were interviewed. The analyslis of this study was performed using STATA statistical software and controlled for the desing effects of this study.

Main Findings

The monitoring table highlights that:

- Overall, about half of the children under the age of five that were included in this survey sample lived in a household with at least one mosquito net. There were significant

differences in this indicator between the provinces; 76% in Inhambane, 52% in Maputo and 40% in Zambezia.

- When using the total sample, indicators of net use by children under five are very low: only one-third of children slept under any mosquito net during the previous night. When limiting the sample to include on those households that currently own a mosquito net, this same indicator increases to 70% for all the provinces combined, with significant differences between provinces: 80% in Zambezia, 61% in Inhambane and 59% in Maputo.
- Net use during the most recent pregnancy (as reported by caregivers of children under the age of five) was very low: only 50% of respondents in Inhambane, 29% in Maputo and 23% in Zambezia reported always sleeping under a mosquito net during their most recent pregnancy.
- Variables measuring caregiver's opportunity to use mosquito nets were quite low: scale means (ranging from 1 to 4) for measures of availability and social norms were generally below 2.5. The opposite is true of variables measuring the caregiver's motivation, where scale means for attitudes, intentions, susceptibility and severity are generally above 3.5.
- Knowledge of malaria transmission is quite low: means on this index are all around 3.0 out of a total of 6 questions, indicating that there is some incorrect knowledge or incorrect beliefs regarding malaria transmission.

The results of segmentation analysis indicate that the probability of children under the age of five sleeping under net increases with:

- *Positive social norms regarding mosquito net use.* The social norm scale mean was only 2.6 among caregivers of children under five who did not sleep under a net, as compared to 2.8 among caregivers of children who did sleep under a net the previous night.
- *Self-efficacy to use mosquito nets.* Caregivers who are confident in their ability to use nets are more likely to have their children sleep under a net. The respective means are 3.59 for users and 3.40 for non-users ($p<.001$).
- *Improved attitudes towards nets.* The results show that a caregiver's attitudes to use nets are significantly associated with net use by their children. Mean values on this scale are: 3.87 for caregivers whose children slept under a net and 3.75 for those who didn't.

There were some critical demographic factors that were also associated with net use by children under the age of five. These variables demonstrate that net use by children under five decreases:

- *With increasing age of the child.* For every year that a child gets older, the child is 0.76 times less likely to sleep under a net. The mean age among children who slept under a net was lower than children who did not sleep under a net (2.15 vs. 2.75).
- *If the child is female.* Male children were 1.56 times more likely to sleep under a net than female children.

Programmatic Recommendations

- Despite PSI's and the Ministry of Health's efforts to ensure that families of children under the age of five receive a mosquito net, a large percentage of households with children under the age of five do not currently own nets (particularly in Maputo and Zambezia).
- Findings show that even among households that currently possess nets, children under the age of five may not be sleeping under a net. While increasing net ownership is critical to increasing net use, improving ownership alone will not ensure that all children are protected.

- While attitudes and self-efficacy are significantly associated with net use, the mean values for the scales are already very high and do not leave much room for improvement among those currently not using nets.
- Social norms were found to produce positive results in a simulation analysis (see Segmentation Graph 1): investing in this determinant has the potential increasing net use from 67% to almost 75%. This determinant was also deemed as a component that can be improved by a communication campaign because: 1) current scale means are not very high; 2) it is an appropriate determinant for a "rural" campaign; 3) tight-knit communities and community structures can used to maximize impact of this determinant; and 4) the social norm for using the net already exists, as a large percentage of children are already sleeping under a net.
- The child's age was found to have a very significant effect on net use. Simulation analysis (Segmentation Graph 3) shows that ensuring that older children are prioritized equally as younger children will have the greatest increase in the outcome (67% to 79%), as compared to other determinants. Given that nets already exist in the households, the importance of ensuring the the child continues to sleep under a net is critical. Two drop-off points for net use were apparent in the data, the first is when the infant turns one, and the second is when the child turns three. Future qualitative research should attempt to determine the reasons for these drop-offs in net use as children grow older.

  The results of this study were used to select the determinants that will be addressed in the upcoming nation-wide communication program that promotes net use among children under the age of five. The program decided to prioritize social norms for using nets and child's age as key factors to be addressed.

Monitoring Table

Trends in net ownership, net use and determinants of net use by province, 2009

Risk: ***Caregivers of children under the age of five***

Behavior: ***Enter the major behavior of interest here***

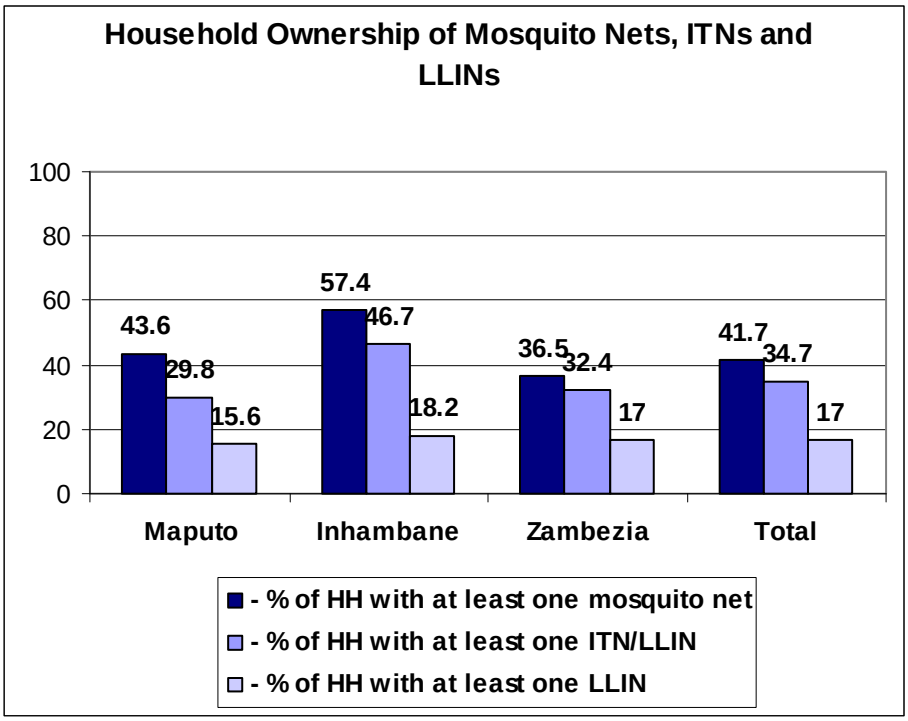
INDICATORS	Maputo (n=546)	Inhambane (n=515)	Zambezia (n=597)	Total (n=1621)
OWNERSHIP/USE				
- % of HH with at least one mosquito net	43.6 (n=923)	57.4 (n=888)	36.5 (n=1061)	41.7 (n=2872)
- % of HH with at least one ITN/LLIN	29.8 (n=923)	46.7 (n=888)	32.4 (n=1061)	34.7 (n=2872)
- % of HH with at least one LLIN	15.6 (n=923)	18.2 (n=888)	17.0 (n=1061)	17.0 (n=2872)
-% of children <5 who live in HH with at least one mosquito net	52.4 (n=715)	76.1 (n=681)	40.3 (n=884)	48.8 (n=2280)
- % of children <5 who slept under a mosquito net during the previous night	31.4 (n=715)	46.4 (n=681)	32.3 (n=882)	34.8 (n=2278)
- % of children <5 who slept under a mosquito net during the previous night (in HH with mosquito nets)	58.5 (n=354)	61.0 (n=498)	79.5 (n=413)	70.5 (n=1265)
-% of children <5 who slept under a ITN/LLIN during the previous night (in HH with mosquito nets)	39.9 (n=354)	50.4 (n=498)	72.8 (n=413)	60.7 (n=1265)
-% of caregivers of children <5 who live in HH with at least one mosquito net	45.8 (n=540)	71.8 (n=510)	37.1 (n=583)	43.1 (n=1633)
- mean number of nets in HH as reported by caregivers who have at least one net	1.79 (n=233)	1.85 (n=352)	1.90 (n=258)	1.87 (n=843)
- % of women who reported always sleeping under a mosquito net during their previous pregnancy	29.0 (n=487)	49.7 (n=469)	22.9 (n=551)	27.3 (n=1507)
OPPORTUNITY				
Availability	2.03	2.08	2.2	2.16
Product Attributes	3.2	3.27	3.12	3.15
Social Norms	2.42	2.67	2.37	2.42
ABILITY				
Knowledge Transmission (6 items) Malaria can only be transmitted through mosquito bites Mosquitoes that trasmit malaria only bite at night Malaria can be caused by witchcraft R Malaria is caused by exhaustion R Malaria is caused by changes in the weather R All mosquitoes transmit malaria R	3.24	2.91	2.7	2.81
Knowledge Prevention (3 items) Sleeping under a mosquito net every night can reduce malaria transmission Draining standing water is a way to prevent malaria You can use insecticides to prevent malaria	2.35	2.34	1.91	2.03
Knowledge Symptoms (3 items) Covulsions are a sign of severe malaria Having a fever is the primary sign of malaria Having a fever could be a sign of malaria	1.8	2.02	1.81	1.84
Self-Efficacy	3.28	3.49	3.28	3.3
MOTIVATION				

Segmentation Table: Population

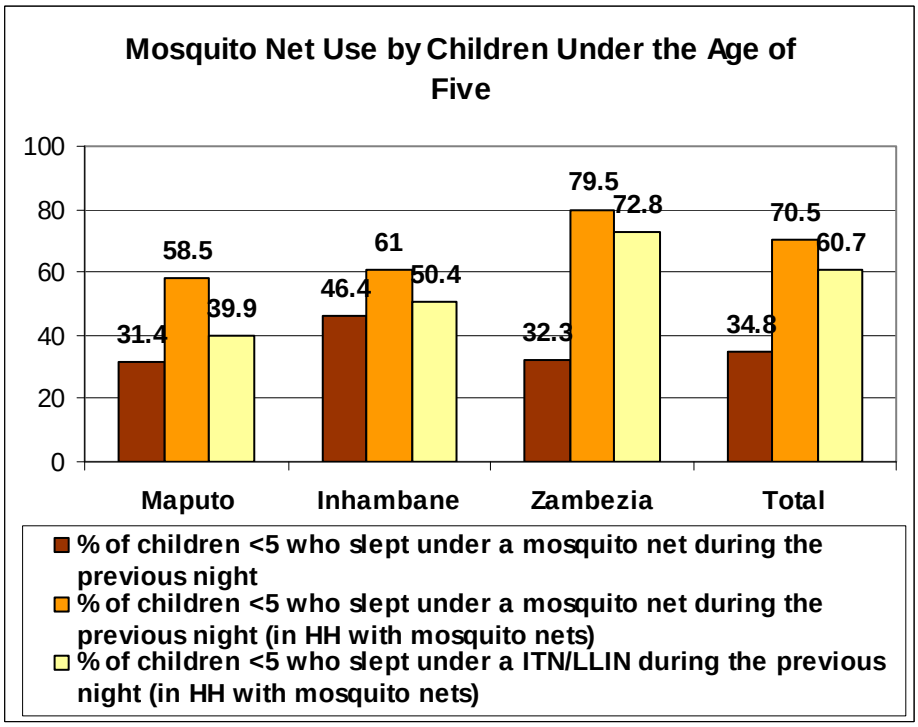
Mozambique, 2009

Attitudes	3.82	3.89	3.67	3.72
Outcome Expectation	3.46	3.63	3.55	3.55
Threat (Susceptibility)	3.76	3.84	3.67	3.71
Threat (Severity)	3.71	3.74	3.58	3.62
EXPOSURE				
- % of caregivers who saw or heard a program about malaria prevention in the previous 12 months	77.1 (n=540)	64.1 (n=509)	36.1 (n=582)	45.7 (n=1631)
- % of caregivers who saw or participated in a presentation or theatre show about malaria	20.1 (n=540)	14.0 (n=509)	7.5 (n=582)	10.1 (n=1631)

Monitoring Graph 1: Key Net Ownership Results



Monitoring Graph 2: Key Net Use Results



Segmentation Table

Determinants of net use by children under the age of five living in Maputo, Inhambane and Zambezia Provinces, Mozambique 2009

Risk: ***Children under the age of five who live in a HH with at least one net***

Behavior: ***Slept under any mosquito net during the previous night***

INDICATORS	Used net N=845 67.4%	Did not use net N=408 32.6%	OR	Sig.
OPPORTUNITY				
Social Norms	2.82	2.61	1.34	*
ABILITY				
Self-Efficacy	3.59	3.40	1.75	**
MOTIVATION				
Attitudes	3.87	3.75	1.73	*
POPULATION CHARACTERISTICS				
Age of the child	2.15	2.75	0.76	***
Sex of the child (male)	54.4	43.0	1.56	*
Together decide how income is spent in family	26.7	18.7	1.56	*
Zambezia	61.1	31.1	3.44	***

-*: p<.05; **: p<.01; ***: p<.001.

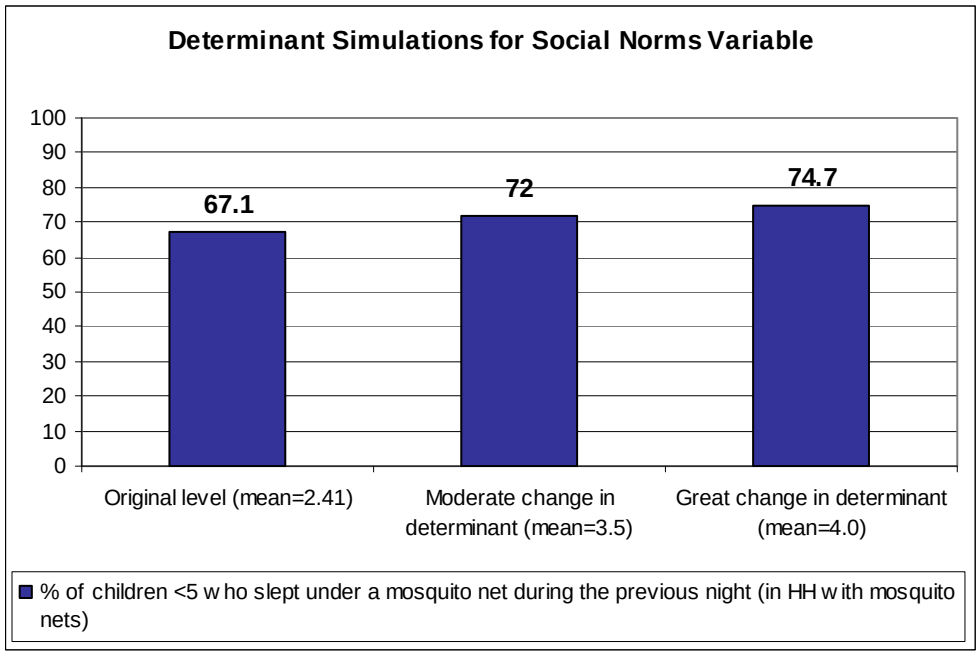
-OAM Determinants: values ranged from 1-4 "strongly disagree=1, Disagree=2, Agree=3, Strongly Agree=4

- F(7, 137) =17.27, Prob > F=0.0000

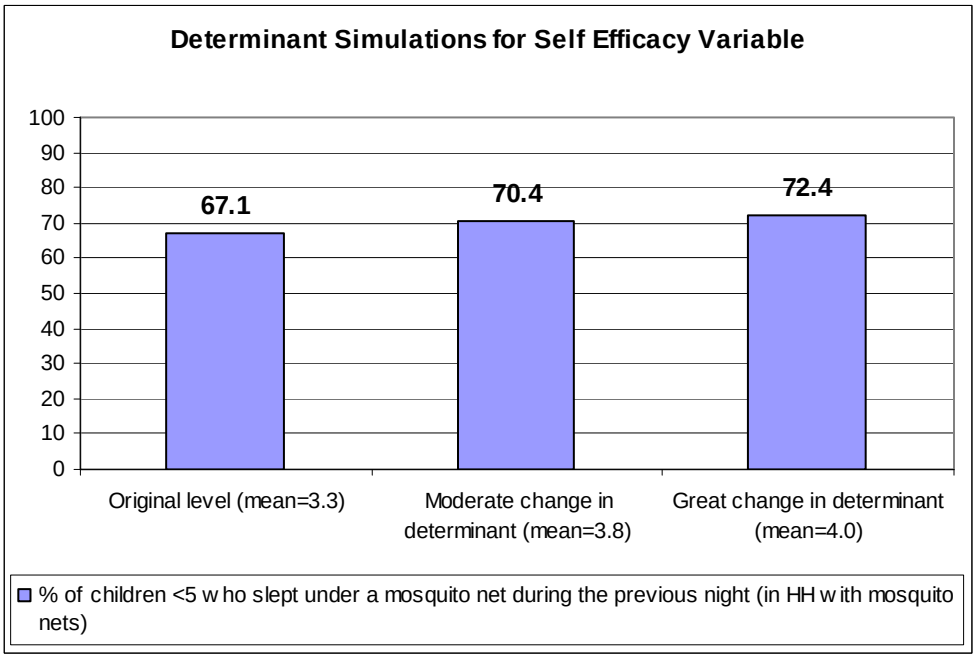
- H-L GOF χ^2: 984.20, p=0.2146

- Pseudo R Sq=0.11

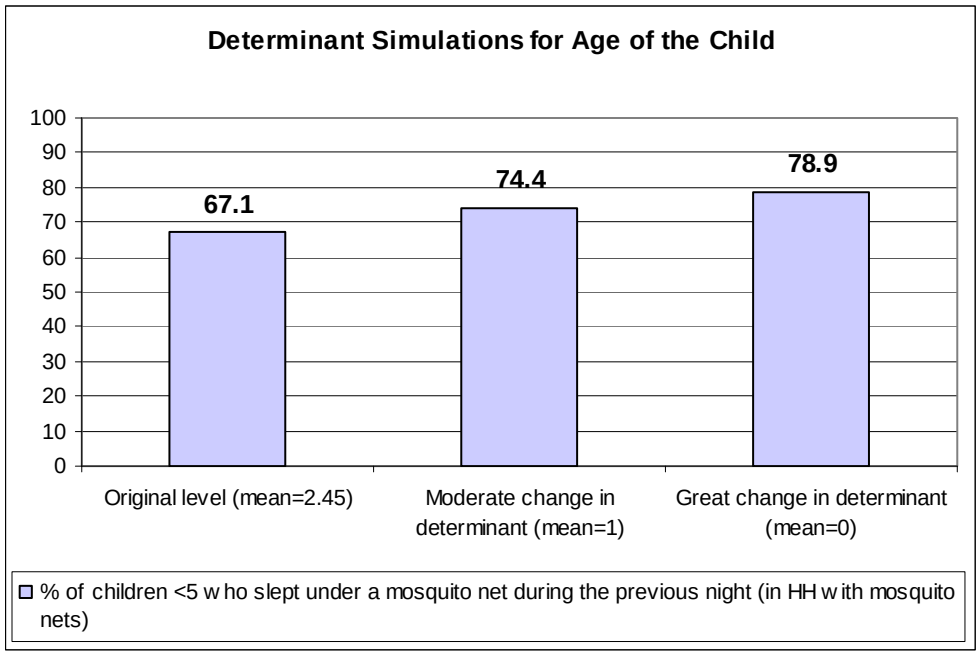
Segmentation Graph 1: Key Simlaution Results for Social Norms Variable



Segmentation Graph 2: Key Simulation Results for Self Efficacy Variable



Segmentation Graph 3: Key Simulation Results for Child Age Variable



Population Characteristics

POPULATION CHARACTERISTICS	
Total	N=1658
Province	
Maputo	14.1 (n=546)
Inhambane	13.7 (n=515)
Zambezia	72.1 (n=597)
Mother's Age	
18-25	34.1 (n=586)
26-30	25.1 (n=404)
31-35	17.4 (n=251)
36-40	12.8 (n=196)
41-45	4.8 (n=93)
46+	5.9 (n=95)
Marital Status	
Single	7.5 (n=197)
Married/Union	85.2 (n=1311)
Seperated/Divorced/Widowed	7.3 (n=125)
Own source of income	
Yes	82.5 (n=394)
No	17.5 (n=1239)
Who in HH decides how money is spent	
Mother	14.9 (n=283)
Partner	57.3 (n=696)
Mother+Partner	18.4 (n=399)
Others	9.4 (n=254)
Schooling	
No formal schooling	41.7 (n=497)
Primary	50.5 (n=894)
Secondary or higher	7.9 (n=242)
Listens to the Radio	
Yes	57.4 (n=992)
No	42.6 (n=641)

Annex 1: Table of Population Characteristics

Mozambique, 2009

Watches Television	
Yes	14.1 (n=498)
No	85.9 (n=1135)
Reads the Newspaper	
Yes	5.76 (n=155)
No	94.2 (n=1478)
Has spend most of her life in this village/city	
Yes	79.8 (n=1159)
No	20.2 (n=474)
Strata	
Urban	18.3 (n=416)
Rural	81.7 (n=1242)

Reliability Analysis

Composite Variables	Year (N=1672) Cronbach's Alpha
OPPORTUNITY	
Availability 1. *I know where to get a mosquito net* 2. *I can obtain a mosquito net easily in a store in my village/neighborhood* 3. *I can obtain a mosquito net easily at a health center or mission in my community* 4. *I can obtain a mosquito net easily from a committee in my village/neighborhood* 5. *I can obtain a mosquito net easily from an NGO in my community*	**.809**
Product Attributes 1. *It gets too hot when you sleep under a mosquito net R* 2. *I feel uncomfortable when I sleep under a mosquito net R* 3. *It is tiring to hang a mosquito net. R* 4. *It is tiring to take down and pull up the mosquito net. R* 5. *It's hard to hang a mosquito net so that people can sleep under them R* 6. *Mosquito nets take up a lot of space in my room R* **7.** *The mosquito net fabric can cause a rash R*	**.828**
Social Norm: 1. *My neighbors use mosquito nets* 2. *Other people in my family use mosquito nets in their homes* 3. *Most of my friends make sure that their children sleep under mosquito nets* 4. *Most of the people in my community ensure that their children regularly sleep under a mosquito net*	**.867**
ABILITY	
Self-Efficacy: 1. *I can easily protect my family from malaria* 2. *I can ensure that my children sleep under a mosquito net every night* 3. *I can easily hang up my mosquito net* 4. *I know how to use a mosquito net correctly*	**.781**
MOTIVATION	
Attitudes: 1. *It is good that people use mosquito nets.* 2. *Pregnant women should sleep under mosquito nets regularly* 3. *Children under the age of five should sleep under mosquito nets regularly* 4. *People should sleep under mosquito nets to prevent mosquito bites.*	**.744**
Intention 1. *I will do every thing I can to ensure that my children sleep under a mosquito net* 2. *I will do everything I can to ensure that I always sleep under a mosquito net* 3. *I intend to always have a mosquito net that I can use in my home*	**.845**
Outcome Expectation 1. *If I have my children sleep under a net they will be less likely to get malaria.* 2. *Mosquito nets are very effective in the prevention of mosquito bites* 3. *If I sleep under a mosquito net, I will not be bothered by the sound of mosquitoes*	**.710**

4. Preventing malaria will help my family save money *5. Use of mosquito nets helps children get a good night sleep*	
Threat (Susceptibility) *1. Any person is at risk for getting malaria* *2. A child under the age of five can die from malaria* *3. Children get malaria when they are not protected from mosquito bites* *4. Malaria can causes serious consequences to a pregnant woman* *5. It is necessary to take the child to the health center for severe malaria* *6. It is very severe to get malaria during pregnancy*	**.801**
Threat (Severity) *1. I'm afraid that if my child gets malaria he will die.* *2. Malaria can prevent me from working and earning an income* *3. Malaria can keep a child from going to school.* ***4.** Malaria is a severe disease*	**.777**

(All scales range from 1 to 4 where 1= strongly disagree and 4=strongly agree):

Performance Review Indicator Table

PERFORMANCE REVIEW INDICATORS[1]	Maputo	Inhambane	Zambezia	Total
	%	%	%	%
- % of HH with at least one mosquito net	43.6 (n=923)	57.4 (n=888)	36.5 (n=1061)	41.7*** (n=2872)
- % of HH with at least one ITN/LLIN	29.8 (n=923)	46.7 (n=888)	32.4 (n=1061)	34.7** (n=2872)
- % of children <5 who slept under a mosquito net during the previous night	31.4 (n=715)	46.4 (n=681)	32.3 (n=882)	34.8 (n=2278)
- % of children <5 who slept under an ITN or LLIN during the previous night	20.9 (n=715)	38.4 (n=681)	29.4 (n=882)	29.6 (n=2278)

[1] The sample size does not have sufficient power to calculate indicators for women who are pregnant at the time of the survey.

Concentration Index Table

CONCENTRATION INDEX	%	CI
- % of HH with at least one mosquito net	41.7 (n=2872)	-0.1338
- % of HH with at least one ITN/LLIN	34.7 (n=2872)	-0.0773
- % of children <5 who slept under a mosquito net during the previous night	34.8 (n=2278)	-0.0578
- % of children <5 who slept under an ITN or LLIN during the previous night	29.6 (n=2278)	-0.0197

Segmentation Graph Analysis Methods

Using the final predictive model for net use (presented in the segmentation table in this report) simlulations were performed in which key determinants were modified to assess their effect on the levels of the outcome variable. In the simulations presented in the previous section, the values of the determinants were adjusted to reflect changes if these where addressed by programs with "moderate" intensity and "high" intensity. This analysis produces visual results that represent the "pay-off" in the outcome variable given the investment in changing the determinant. The first bar of the segmentation graph presents the current level of the outcome given the current levels of the determinants. The second bar represents the predicted level of the outcome if the determinant in question was improved "moderately," holding all other determinants at their current level. The third bar represents the predicted level of the outcome if the determinant was improved "greatly." These simulations assume that the determinants included in the predictive model would not change during the time the program is implemented.