SOCIAL MARKETING RESEARCH SERIES

PSI

Madagascar (2006): Malaria TRaC Study Evaluating the Use of Insecticide Treated Nets among Pregnant Women and Mothers of Children Younger than Five Years

Second Round

The PSI Dashboard

Antananarivo, Madagascar
March 2007

Research Division
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**Madagascar (2006): Malaria TRaC Study Evaluating the Use of
Insecticide Treated Nets among Pregnant Women and Mothers of
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Summary

Background & Research Objectives In October and November 2006, PSI/M conducted a household survey designed to investigate practices related to malaria prevention. Additionally, PSI/M sought to assess household insecticide treated net coverage for a representative sample of women 15-49 years of age. The 2006 survey was a follow-up to a baseline conducted in October and November 2004. Both surveys aimed to provide evidence for social marketing decision making as well as to help measure the impact of various interventions and strategies. Collectively, this report presents identified behavioural determinants of insecticide treated mosquito net (ITN) use and related behaviors. It measures trends of indicators relating to the PSI/M's malaria prevention logical frameworks, serves as a tool for performance review and illustrates impacts of the program exposure. The findings in this report are intended to provide guidance for future activities.

Description of Intervention The goal of the PSI/M malaria prevention program is to reduce mortality and morbidity among pregnant women and children under five years old by improving the availability and use of ITNs. Since 2001, PSI /M has worked to promote the use of ITNs as well as to design evidence-based health communications. PSI distributes an ITN - branded *Super Moustiquaire* - at a subsidized price of approximately $1.50 to the end user. In 2006, PSI/M delivered more than 796,000 treated mosquito nets, and it has distributed more than 1.7 million since 2001.

Methodology Two cross-sectional surveys were conducted in October/November 2004 and October/November 2006, respectively. Women aged between 15 and 49 years old from all regions were eligible for the study. Multi-stage stratified sampling was used in both surveys. A total of 2,138 and 2,559 eligible women were recruited in rural and urban areas for the 2004 baseline and 2006 follow up studies respectively. For the purpose of the current report, only data for pregnant women and mothers/caregivers of children under five years of age were used.

For the two cross sectional surveys, PSI/M used the methodology of project TRaC, which is designed to provide actionable evidence for decision making. TRaC surveys systematically and repeatedly measure levels and trends of indicators such as exposure to social marketing interventions, behaviors, and behavioral determinants. These behavioral determinants of the PSI Behaviour Change framework (see annex 4) are categorised in terms of opportunity, ability and motivation or OAM.[1] Results are presented in the form of standard tables – namely the segmentation table, the monitoring table, and the evaluation table which are referred to collectively as the dashboard. As explained in further detail below, these tables are useful for making decisions relating to strategic, project, and marketing planning.

Main Findings For both surveys, perception of availability and belief were found to be significant determinants of ITN use. Willingness to pay was another significant determinant in the baseline survey.

The data showed sharp increases in the owenership and use of ITNs over time. The 2006 survey showed that 45.1 percent of households owned at least one ITN compared to 21.9 percent in 2004 – a 74% increase in ownership over two years. The proportion of pregnant women who slept under an ITN increased by 135% from 11.9 percent in 2004 to 28.0 percent in 2006. For children under five years old, the same proportion rose 136% from 15.9 percent in 2004 to 37.5 percent in 2006.

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[1]*Opportunity* refers to community and program factors that promote or inhibit recommended behaviors. The term covers factors such as availability and brand appeal.

Ability summarizes the individual's skill or proficiency at solving problems given the setting. It covers factors such as self-efficacy, social norms, social support, and affordability.

Motivation describes how a person has developed self-interest in changing his or her behavior. Included in this category are outcome expectation, personal risk assessment, awareness of health problem, awareness of causes and severity.

In terms of determinants of ITN ownership and use, women stating that malaria is transmitted only through mosquitoes increased from 30.1 to 35.0 percent over the two years. Perceptions of the threat of malaria also increased. For example, more respondents (16.6 in 2004 versus 28.7 in 2006) knew that malaria is most serious for pregnant women. Moreover, they perceived that malaria is most serious among children under five years old with the proportion increasing from 49.7 to 60.9 percent.

Outcome expectation and willingness to pay were found to be significant determinants in the use of social marketing brands.

Programmatic Recommendations The results from the survey in 2006 indicate positive trends in health behavior, knowledge, and awareness of the threat of malaria since the 2004 survey.

Perceptions of availability, (false) beliefs and willingness to pay were found to be significant determinants in the use of treated nets in 2004. In 2006, availability and belief remained statistically significant. So, it is the recommendation of this report that PSI/Madagascar activities and interventions should reinforce the availability message and messages to eliminate false beliefs. These activities should be expanded, with attention paid to the type of promotional channel and support to be used, including radio, television, and printed materials.

Segmentation Table 2004

Behavioral Determinants of Malaria Prevention: Comparing Those who Slept under a Treated Net Last Night versus Those who did not in Madagascar Nationally (2004)

Risk: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age in Madagascar Nationally

Behavior: Slept under a Treated Net Last Night

INDICATORS	Behaver (N=226) (16.1%)	Non-Behaver (N=1176) (83.9%)	OR	Sig
OPPORTUNITY	Mean Scores	Mean Scores		
Availability	1.98	1.87	1.39	**
ABILITY	Mean Scores	Mean Scores		
Knowledge	---	---	---	ns
MOTIVATION	Mean Scores	Mean Scores		
Belief	3.29	3.02	2.58	***
Outcome Expectation	---	---	---	ns
Threat	---	---	---	ns
Willingness to Pay	7321.00	5190.00	1.00	***

POPULATION CHARACTERISTICS	Means	Means		
Age (15 to 49 years of age)	---	---	---	ns
Level of Education (Secondary and more versus Primary)	---	---	---	ns
Marital Status (Married versus Unmarried)	---	---	---	ns
Socio-Economic Status (High versus Low)	---	---	---	ns

- ns: not significant, *: $p < .05$; **: $p < .01$; *** $p < .001$
- Mean scores are measured on Likert scale responses, ranging from 1 (strongly disagree) to 4 (strongly agree)
- Knowledge mean scores are based on an index of 19 items, which result in a theoretical mean score from 19 (completely incorrect) to 38 (completely correct)
- Willingness to Pay: maximum prices vary from 100 to 40,000 Ariary
- High socio-economic status refers to the highest quintile in terms of amenities and assets possession
- Pseudo-R^2=11.4%
- OR= Odd Ratio
- "---" Reliable Cronbach's Alpha but not significant in the analysis

Segmentation Analysis 2004: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

Segmentation Analysis 2004: Determinants of Use of ITN among Pregnant Women Aged 15-49 years old and Mothers/Caregivers of children under five years of age, Madagascar

In the segmentation table, the priority audience is pregnant women aged 15 and 49 years and children under five years of age in Madagascar nationally. Data were obtained from pregnant women and mothers/caregivers of children under five years old. The dependent variable of interest is whether a pregnant woman or mothers/caregivers of child under five slept under a treated net last night (1=yes, 0=no). Logistic regression analysis was conducted to explore correlates of usage of treated nets among vulnerable populations. Mean scores and adjusted percentages for determinants that were found to be statistically significant are shown in the table, with non-significant factors indicated with dashes. The mean scores and percentages are adjusted for other significant factors in the final logistic regression model: availability, belief, and willingness to pay. Five scales measuring the OAM constructs which were found to be reliable (Cronbach's alpha>0.7), were used for the segmentation analysis: availability, knowledge, belief, outcome expectation and threat. Willingness to pay was used in the logistic regression model. Results of the reliability analysis can be found in Appendix 3.

The analysis showed that perceptions of availability, belief, and willingness to pay determine the use of treated nets among pregnant women and children under five in 2004. Behavers scored 1.98 (on a scale of 1: strongly disagree to 4: strongly agree) on average on the availability, compared with 1.87 for those who did not use a treated net last night. Although the scores were relatively low, the finding indicates that perception of availability can have an impact on the use of treated net. The other determinant found to significantly differentiate users and non-users was belief or false belief related to the use of insecticide treated net (examples: Insecticide treated mosquito net provoke coughing; To sleep under a white mosquito net makes one think about death; etc.): users scored 3.29 on the belief scale on average compared to 3.02 for non-users. These scores were relatively high. This finding means that users of insecticide treated net are less likely to have false beliefs about ITN use. The last determinant found that presented significant difference between users and non-users is the willingness to pay for an insecticide treated net. The average maximum price among users is about 7321 ariary compared to 5190 ariary among non users. This finding means that the more users are willing to pay for a net, the more likely they were likely to use an insecticide treated net. The population characteristics (namely age; level of education; marital status and socio-economic status) did not indicate a significant difference between users and non-users.

Monitoring Table

Trends and Levels of Indicators for Malaria Prevention: Percentages and Mean Scores for Behaviors, Behavioral Determinants, Exposure, and Source of Supply in Madagascar Nationally (2004 versus 2006)

Risk: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age in Madagascar Nationally

INDICATORS	2004 (N=1367)	2006 (N=1553)	Sig.
BEHAVIOR/USE	%	%	
- Owned at least one untreated mosquito net or insecticide treated net (ITN)	66.3	63.9	ns
- Slept under untreated mosquito net or ITN the previous night (among pregnant women)	47.2	49.2	ns
- Slept under untreated mosquito net or ITN the previous night (among children under five years of age)	51.7	54.8	ns
- Owned at least one insecticide treated mosquito net	21.9	45.1	***
- Slept under treated net last night (among pregnant women and children under five years of age)	16.1	37.7	***
- Slept under a treated net the previous night (among pregnant women)	11.9	28.0	***
- Slept under a treated net the previous night (among children under five years of age)	15.9	37.5	***

OPPORTUNITY	% or Mean Scores	% or Mean Scores	
Availability			
- Know where to buy ITN	58.8	65.2	**
Mean	1.89	2.22	***

ABILITY	% or Mean Scores	% or Mean Scores	
Knowledge			
- Know malaria is transmitted only through mosquitoes	30.1	35.0	**
Mean	36.55	36.52	ns

MOTIVATION	% or Mean Scores	% or Mean Scores	
Belief			
Mean	3.07	3.12	**
Outcome Expectation			
- Cited treated nets as the most effective method of preventing malaria	72.3	82.5	***
Mean	3.85	3.89	***
Threat			
- Know malaria is most serious for pregnant women	16.6	28.7	***
- Know malaria is most serious for children under 5 years of age	49.7	60.9	***
Mean	3.68	3.72	**
Willingness to Pay			
- Mothers/caregivers who consider ITN affordable	52.1	75.6	***
Mean	5506.50	6640.34	***

EXPOSURE	%	%	

Monitoring Table 2004-2006: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

- Heard the slogan of SuperMoustiquaire (1 activity)	48.1	53.3	**
- Heard radio spots on SuperMoustiquaire (21 activities)	35.4	64.8	***
- Saw TV spots on Supermoustiquaire (2 activities)	15.6	12.9	**
- Attended mobile video unit sessions on SuperMoustiquaire (2 activities)	5.5	11.9	***
- Heard radio program "Toky sy Antoka" on Supermoustiquaire (14 activities)	13.7	33.9	***
- Saw or got Behavior Change Communication materials on Supermoustiquaire (2 activities)	46.0	54.0	***

MARKET SHARE	%	%	
- Private sector	n/a	10.4	n/a
- Public Sector	n/a	26.4	
- Social marketing	n/a	63.2	

- ns: not significant, *: $p<.05$, **: $p<.01$, ***: $p<.001$
- Mean scores are measured on Likert scale responses, ranging from 1 (strongly disagree) to 4 (strongly agree)
- Knowledge mean scores are based on an index of 19 items, which result in a theoretical mean score from 19 (completely incorrect) to 38 (completely correct)
- Willingness to Pay: maximum prices vary from 100 to 40,000 Ariary
- Population characteristics controlled for are age, marital status, socio-economic status, and education
- Some indicators have different sample sizes, which are available upon request

Monitoring Analysis 2004-2006: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

Monitoring Analysis: Trends and Levels of Indicators for Malaria Prevention: Percentages and Mean Scores For Behaviors, Behavioral Determinants, Exposure, and Source of Supply in Madagascar Nationally (2004 versus 2006)

This monitoring dashboard uses analysis of variance to see whether measures of behavior have changed over time, while controlling for population characteristics. Additionally, the monitoring table can measure trends of indicators relating to opportunity, ability, and motivation. Level of exposure according to the category of activities and source of supply are also examined here. For behavioral indicators, the monitoring table presents percentages of respondents affirming the behavior in question. Mean scores and/or corresponding percentages are presented for the behavioral determinants.

Behavioral Indicators and Behavioral Determinants

A majority of the indicators relating to the behavior and the use of insecticide treated mosquito nets increased significantly from 2004 to 2006. Households owning at least one treated mosquito net increased from 21.9 percent in 2004 to 45.1 percent in 2006 (74% increase). There was also an important improvement from 11.9 percent in 2004 to 28.0 percent in 2006 on the number of pregnant women who slept under a treated mosquito net the previous night (135% increase). For the same indicator, a significant gain was noted among children under five years old, 15.9 percent in 2004 and 37.5 percent in 2006 (136% increase).

The proportion of pregnant women and mothers or caregivers who know where to buy insecticide treated mosquito net also increased from 58.8 percent in 2004 to 65.2 percent in 2006. With regard to the perception of availability, the mean scores showed an important improvement from 1.89 in 2004 to 2.22 in 2006. It is noticed that the levels were still low.

An increase was noted on the proportion of pregnant women and mothers/caregivers who know that malaria is transmitted only through mosquitoes – 30.1 percent in 2004 and 35.0 percent in 2006. The proportion of respondents who spontaneously cited treated nets as the most effective method of preventing malaria is high, and there was a significant increase between the two years, from 72.3 percent in 2004 to 82.5 percent in 2006. The mean score increased also significantly over the time from 3.85 to 3.89 for outcome expectation. As the scales can vary from 1: strongly

Monitoring Analysis 2004-2006: 15 to 49 Year Old Pregnant Women and
Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

disagree to 4: strongly agree, the mean score for outcome expectation was high which was close to maximum score.

Respondents perceived that malaria is most serious either for pregnant women (16.6 percent in 2004 versus 28.7 percent in 2006) or for children under five (49.7 percent in 2004 versus 60.9 percent in 2006). The mean for threat was in high with the scores varied from 3.68 in 2004 to 3.72 in 2006.

The findings also indicate that respondents were willing to pay more for an ITN in 2006 (6640.34 ariary) compared to 2004 (5506.5 ariary). A majority of respondents considered insecticide treated mosquito net affordable, 52.1 percent in 2004 compared to 75.6 percent in 2006.

Exposure

The program activities assessed for both surveys were categorized into six types: the slogan, radio spots, TV spots, mobile video unit, "toky sy antoka" program, and behavior change communication materials. Overall, levels of exposure for each category of the activities increased significantly from 2004 to 2006 except for those who saw TV spot on *Super Moustiquaire* of which the proportion decreased from 15.6 percent in 2004 to 12.9 percent in 2006. This decrease is tied with the number of TV spots considered in 2004 (3 TV spots) compared to 2006 (2 TV spots).

Market Share

The indicators relating to the market share were available only in 2006. As indicated in the table, 63.2 percent of the respondents reported their insecticide treated nets came from the social marketing sector. The public sector was second in market share at 26.4 percent followed by the private sector at 10.4 percent.

Segmentation Table for Source of Supply 2006: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

Segmentation Table for Source of Supply

Behavioral Determinants of Malaria Prevention: Comparing Those who used the Social Marketing Nets versus Those who Used the Commercial or Public Sector Net in Madagascar Nationally (2006)

Risk: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age in Madagascar who Slept Under a Net the Previous Night

Behavior: Used Brands from Social Marketing Sector

INDICATORS	Social Marketing Sector Brands (N=381) (63.2%)	Private and Public Sector Brands (N=222) (36.8%)	OR	Sig.
OPPORTUNITY	Mean Scores	Mean Scores		
Availability	---	---	---	ns
ABILITY	Mean Scores	Mean Scores		
Knowledge	---	---	---	ns
MOTIVATION	Mean Scores	Mean Scores		
Belief	---	---	---	ns
Outcome Expectation	3.94	3.87	3.45	**
Threat	---	---	---	ns
Willingness to Pay	7494.35	6267.03	1.00	**

POPULATION CHARACTERISTICS	% or Mean Scores	% or Mean Scores		
Age (15 to 49 years of age)	---	---	---	ns
Level of Education (Secondary versus Primary)	36.3	25.9	1.79	**
Marital Status (Married versus Unmarried)	---	---	---	ns
Socio-Economic Status (High versus Low)	24.9	13.5	2.68	**

- ns: not significant, *: p <.05; **: p <.01; *** p<.001
- Mean scores are measured on Likert scale responses, ranging from 1 (strongly disagree) to 4 (strongly agree)
- Knowledge mean scores are based on an index of 19 items, which result in a theoretical mean score from 19 (completely incorrect) to 38 (completely correct)
- Willingness to Pay: maximum prices vary from 300 to 30,000 Ariary
- High socio-economic status refers to the highest quintile in terms of amenities and assets possession
- Pseudo-R^2=13.9%
- OR= Odd Ratio
- "---" Reliable Cronbach's Alpha but not significant in the analysis

Segmentation Analysis Source of Supply 2006: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

Segmentation Analysis for Source of Supply: Determinants of Use of Social Marketing Nets, Madagascar 2006

The analysis considers pregnant women and mother/caregivers of children under five years old, who used an insecticide treated mosquito net the previous night. A logistic regression analysis was conducted with the dependent variable measuring whether the respondent reported using the social marketing net the previous night. Mean scores and adjusted percentages for determinants that were found to be statistically significant are shown in the table with non-significant factors indicated with dashes. The mean scores and percentages are adjusted for other significant factors in the final logistic regression model. Five scales measuring the OAM constructs which were found to be reliable (Cronbach's alpha>0.7), were used for the segmentation analysis: availability, knowledge, belief, outcome expectation, and threat. Willingness to pay was used in the logistic regression model. Results of the reliability analysis can be found in Appendix 3.

The analysis showed that outcome expectation and willingness to pay determined the use of social marketing brands. Those who used social marketing product scored 3.94 (on a scale of 1: strongly disagree to 4: strongly agree) on average on the outcome expectation, compared with 3.87 for those who used private or public sector brands. These high scores indicate that those who use social marketing brands have higher perception of insecticide treated net efficacy . The other determinant found to significantly differentiate the use of either the social marketing brands or private and public sector brands was willingness to pay. Users of social marketing brand were willing to pay 7494.35 Ariary on average compared to 6267.03 Ariary for users of private and public sector brands.   The price of *Super Moustiquaire* is 3000 Ariary, so the maximum prices that the respondents were willing to pay exceed largely the current price. In addition, level of education and socio-economic status were found to significantly differentiate preferred source of supply. These findings indicate that users of social marketing brands are more likely to have higher level of education or higher socio-economic status.

Evaluation Table

Impact of Population Services International / Madagascar's Programmatic Activities on Behavior and Behavioral Determinants for Malaria Prevention in Madagascar Nationally (2006)

Risk: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age in Madagascar Nationally

Behavior: Slept under a Treated Net Last Night

INDICATORS	Ref. 2004 (N=1367) (46.8%)	EXPOSURE			
		Low (N=564) (19.3%)	Medium (N=473) (16.2%)	High (N=516) (17.67%)	Sig
BEHAVIOR/USE	%	%	%	%	
- Owned at least one untreated mosquito net or Insecticide Treated Net (ITN)	66.0 [d1]	54.7 [a]	66.8	68.2 [c]	***
- Slept under untreated mosquito net or ITN the previous night (among pregnant women)	46.6 [d3]	36.9	44.4 [b]	65.0 [c]	**
- Slept under untreated mosquito net or ITN the previous night (among children under five years of age)	51.9 [d]	45.5 [a]	58.2	60.3 [c]	***
- Owned at least one insecticide treated mosquito net	21.3 [d]	37.9 [a]	48.3 [b]	53.9 [c]	***
- Slept under a treated net last night (among pregnant women and children under five years of age)	16.0 [d]	29.4 [a]	37.7 [b]	46.2 [c]	***
- Slept under a treated net the previous night (among pregnant women)	11.4 [d]	21.5	21.6 [b]	43.9 [c]	***
- Slept under a treated net the previous night (among children under 5 years old)	15.8 [d]	29.8 [a]	37.3 [b]	45.5 [c]	**
OPPORTUNITY	Mean	Mean	Mean	Mean	
Availability	1.89 [d]	2.17	2.15 [b]	2.34 [c]	***
ABILITY	Mean	Mean	Mean	Mean	
Knowledge	36.55	36.58	36.46	36.50	Ns
MOTIVATION	Mean	Mean	Mean	Mean	
Belief	3.07 [d3]	3.09	3.09 [b]	3.18 [c]	***
Outcome Expectation	3.85 [d2d3]	3.87	3.89	3.91 [c]	***
Threat	3.68 [d3]	3.66 [a]	3.72 [b]	3.78 [c]	***
Willingness to Pay	5500.86 [d]	5967.71	6482.71 [b]	7489.07 [c]	***

- ns: not significant, *: p <.05; **: p <.01; *** p<.001
- Mean scores are measured on Likert scale responses, ranging from 1 (strongly disagree) to 4 (strongly agree)
- Knowledge mean scores are based on an index of 19 items, which result in a theoretical mean score from 19 (completely incorrect) to 38 (completely correct)
- Willingness to Pay : maximum prices vary from 100 to 50,000 Ariary
- Population characteristics controlled for are age, marital status, socio-economic status, and education
- Low exposure: 0 to 2 activities
- Med exposure: 3 to 18 activities
- High exposure: more than 18 activities
- [a] : Significant between low and medium exposure
- [b] : Significant between medium and high exposure
- [c] : Significant between low exposure and high exposure

- ^{d1} : Significant between reference and low exposure
- ^{d2} : Significant between reference and medium exposure
- ^{d3} : Significant between reference and high exposure
- ^d : Significant between reference and all other exposures

Evaluation Analysis 2004-2006: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

Evaluation Analysis: Impact of PSI/ Madagascar's Programmatic Activities on Behavior and Behavioral Determinants, Madagascar 2004 & 2006

The evaluation table uses data from both survey rounds. Under the column entitled "Ref." (or reference as a reference of comparison), indicator levels are taken from the October 2004 survey round and are equivalent to the levels in the monitoring table.

The remaining three columns are taken from the October 2006 survey round. Low, medium, and high exposure refer to the intensity of exposure. Intensity of exposure is defined as the number of activities to which the respondents were exposed. Low exposure refers to those who were exposed to 0-2 activities, medium exposure refers to those who were exposed to 3-18 activities and high exposure refers to those who were exposed to more than 18 activities. There are in total 42 activities which were categorized in the six activities aforementioned for behavior change communication in the last 12 months. These activities concerned specifically *Super Moustiquaire* as well as malaria in general.

Statistical significance here is labeled with a superscript a, b, c, d, d1, d2 and d3 of which their significances are detailed as follows:

- a: indicates significance between low and medium exposure;
- b: indicates significance between medium and high exposure;
- c: indicates significance between low exposure and high exposure;
- d1: indicates significance between reference and low exposure;
- d2: indicates significance between reference and medium exposure;
- d3: indicates significance between reference and high exposure;
- d: indicates significance between reference and all other exposures;

For example, in 2004, 11.4 percent of pregnant women slept under an insecticide treated net the previous night. Comparing this reference group between levels low (21.5), medium (21.6) and high (43.9), there were significances differences as indicated by the superscript "d." Additionally, differences were statistically significant between low and high exposure indicated by the superscript "c" and between medium and high exposure by the superscript "b."

Evaluation Analysis 2004-2006: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

Overall, the results from the TRaC survey in 2006 indicate positive impact in health behavior. Comparing the reference group to other levels, results were improved significantly. Additionally, for all indicators in health behavior, the superscript "c" indicated that there was significant difference between low exposure and high exposure. In order for communication activities to have more impacts on the behavior change, the activities should be in high level. The first (ownership of untreated mosquito net or insecticide mosquito net) and the third (proportion of children under five years of age who slept under untreated mosquito net last night) indicators had no superscript "b" which means that medium exposure was sufficient to have impacts on health behavior.

As for behavioral determinants, communication activities had impacts except for knowledge. The superscript "c" within the other behavioral determinants meant that low and high exposure presented significant difference; in other words high level of exposure was required in order to have impact in behavioral determinants. However, the superscript "b" was missing on outcome expectations. It indicated that exposure was efficient in medium level.

Segmentation Table 2006

Behavioral Determinants of Malaria Prevention: Comparing Those who Slept under a Treated Net Last Night versus Those who did not in Madagascar Nationally (2006)

Risk: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age in Madagascar Nationally

Behavior: Slept under a Treated Net Last Night

INDICATORS	Behaver (N=592) (38.0%)	Non-Behaver (N=964) (62.0%)	OR	Sig
OPPORTUNITY	Mean Scores	Mean Scores		
Availability	2.34	2.09	1.77	***
ABILITY				
Knowledge	---	---	---	ns
MOTIVATION	Mean Scores	Mean Scores		
Belief	3.25	3.05	1.88	***
Outcome Expectation	---	---	---	ns
Threat	---	---	---	ns
Willingness to Pay	---	---	---	ns

POPULATION CHARACTERISTICS	% or Mean Scores	% or Mean Scores		
Age (15 to 49 years of age)	---	---	---	ns
Level of Education (Secondary and more versus Primary)	29.3	20.8	1.58	***
Marital Status (Married versus Unmarried)	---	---	---	ns
Socio-Economic Status (High versus Low)	---	---	---	ns

- ns: not significant, *: p <.05; **: p <.01; *** p<.001
- Mean scores are measured on Likert scale responses, ranging from 1 (strongly disagree) to 4 (strongly agree)
- Knowledge mean scores are based on an index of 19 items, which result in a theoretical mean score from 19 (completely incorrect) to 38 (completely correct)
- Willingness to Pay: maximum prices vary from 100 to 50,000 Ariary
- High socio-economic status refers to the highest quintile in terms of amenities and assets possession
- Pseudo-R^2=10.4%
- OR= Odd Ratio
  - "---" Reliable Cronbach's Alpha but not significant in the analysis
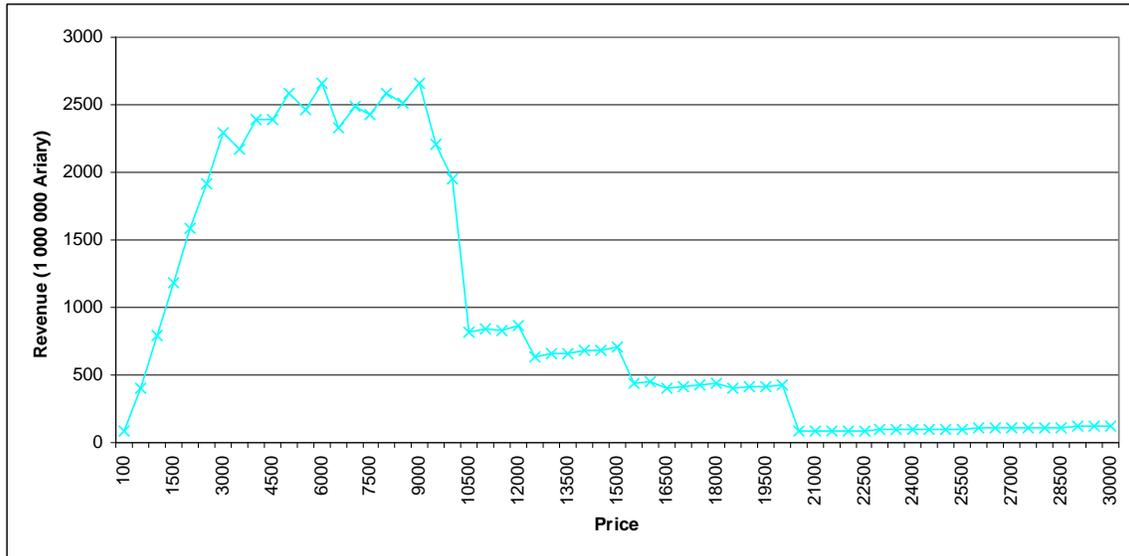
Graph: Willingness to pay and expected revenue

Risk: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age in Madagascar Nationally

Willingness to Pay for Current Users
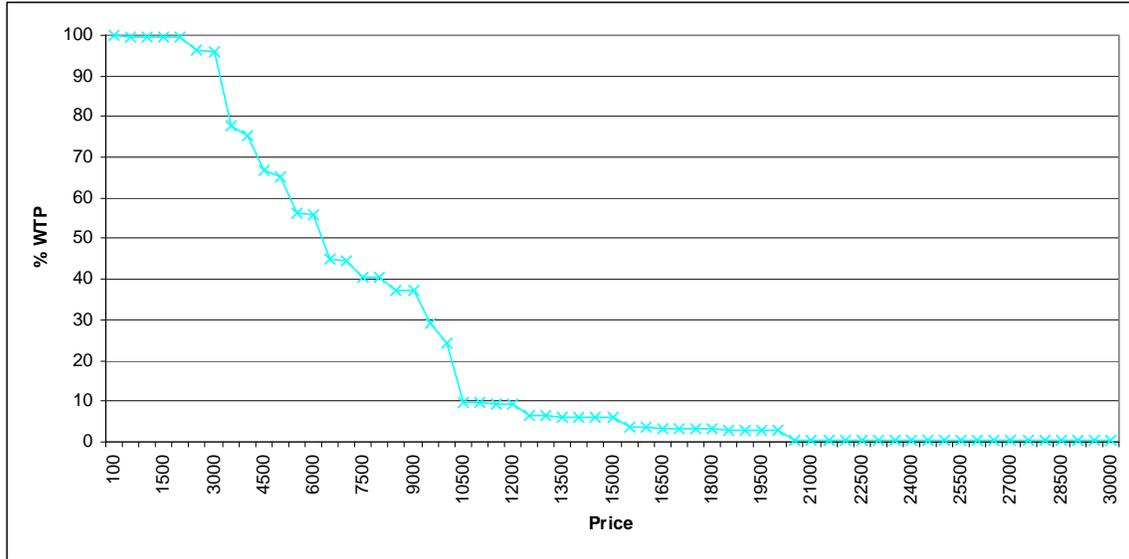
Expected Revenue

Segmentation Analysis 2006: 15 to 49 Year Old Pregnant Women and Mothers/Caregivers of Children under 5 Years of Age

Madagascar, 2006

Segmentation Analysis 2006: Determinants of Use of ITN for Pregnant Women Aged 15-49 years old and Mothers/Caregivers of children under five years of age, Madagascar 2006

In the segmentation table 2006, the group at risk is pregnant women aged between 15 and 49 years old and children under five years of age in Madagascar nationally, but data were obtained from pregnant women and mother/caregivers of children under five years old. The segmentation analysis considered those who slept under a treated net the previous night. A logistic regression analysis was conducted with the dependent variable measuring whether the respondent reported sleeping under a treated net the previous night (1=yes, 0=no). Mean scores and adjusted percentages for determinants that were found to be statistically significant are shown in the table, with non-significant factors indicated with dashes. The mean scores and percentages are adjusted for other significant factors in the final logistic regression model: availability and belief. Five scales measuring the OAM constructs which were found to be reliable (Cronbach's alpha>0.7), were used for the segmentation analysis: availability, knowledge, belief, outcome expectation, and threat. Willingness to pay was used in the logistic regression model. Results of the reliability analysis can be found in Appendix 3.

The analysis showed that perceptions of availability and belief determined the use of treated net among pregnant women and children under five in 2006. Those who used insecticide treated net scored 2.34 (on a scale of 1: strongly disagree to 4: strongly agree) on average on the availability, compared with 2.09 for those who did not use. These scores were relatively low. The finding indicates that the perception of availability can have an impact on the use of insecticide treated net. The only other determinant found to significantly differentiate users and non-users was belief: users scored 3.25 on the belief scale on average compared to 3.05 for non-users. These scores were relatively high. This finding means that non-users would be more likely to use insecticide treated net to prevent malaria if false belief was dispelled. Only one socio-demographic factor was found to significantly differentiate users and non-users: the lower the level of education of women (primary or less) the less they were likely to use treated net to prevent malaria.

Concerning willingness to pay, respondents who stated to have used an insecticide treated net were classified as current users. The investigation on the willingness to pay reveals the level of increase within the price or the maximum price with which they will accept to pay for an insecticide treated net (one unit). As indicated in the figure, the demand decreases with the raising

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of prices. Indeed, at a price of 3000 Ariary, the demand reached 96%, but at a price of 4,000 Ariary the demand decreased to 75%.

Programmatic Recommendations

Maternal and child health campaigns raise awareness of the importance of malaria prevention, and the use of insecticide treated mosquito nets among pregnant women and among children under five years of age. The results from the TRaC survey in 2006 indicate positive trends in health behavior, knowledge, and awareness of the risk perception since the 2004 survey. These results should allow optimism in the prospects for a better way of life for women and children under five years old; particularly because they provide concrete evidence that newly designed health promotion programs have had a positive impact. As such, these results give direction for continued activities in this sector. Moreover, perception of availability, belief (mainly false beliefs on ITN and insecticide) and willingness to pay were found to be significant determinants in the use of treated net in 2004. In 2006, availability and belief remained statistically significant. These two determinants should be addressed in PSI activities despite the fact that levels were improved over the two years span.

Overall, the results presented in this report show concrete evidence of positive change in important health indicators in Madagascar nationally. They also provide indications of the effectiveness of health interventions and campaigns; these should provide direction for those seeking to improve current programs and design follow-on activities.

It is recommended that the activities already addressed should be expanded, with attention paid to the type of promotional channel used. In fact, women showed a much higher awareness of campaigns promoted through mass media channels such as television and radio, which are the main channels for the rural population. Promotional materials were also extremely important sources of information for women. All future printed materials for target groups or community based agents (brochures, counselling cards) as well as the Cinémobile teams should address messages on availability and on false belief. For example, to address availability, the teams should tell targets nets are distributed in outlets with *Super Moustiquaire* sign or by community health workers.

Population Characteristics

(*Priority Audience*)

POPULATION CHARACTERISTICS	2004	2006	Sig
Age			
15-34	76.0	75.9	ns
35-49	24.0	24.1	
Level of education			
Primary	81.2	75.9	**
Secondary and more	18.8	24.1	
Marital Status			
Non-Married	19.6	16.0	*
Married	80.4	84.0	
Socio-economic Status			
Low	82.7	82.6	ns
High	17.3	17.4	
N	1367	1553	

ns: not significant, *: p <.05; **: p <.01; *** p<.001

Methodology

<u>Sampling and participants</u> The target population of the study is women between 15 to 49 years in Madagascar. Women were not included if they had lived in a selected household for fewer than six months. Two cross-sectional surveys were conducted in October/November 2004 and 2006, employing the same sampling strategy. Multistage stratified sampling was used and representative sample of the target population was drawn from rural and urban area separately. The sampling frame was constructed based on the Madagascar National Population Census conducted in 1993, from which the 2004 and 2006 population sizes were projected. The smallest administrative unit called Fokontany was considered as the primary sampling unit. In 2006, 51 and 52 Fokontany were selected from rural and urban areas respectively, using probability of selection proportional to size. Within each selected Fokontany, about 25 households having at least one woman aged between 15 and 49 years old were selected randomly. Then, one eligible woman aged 15 to 49 years old was selected randomly to be interviewed in each household. In 2004, the process was the same however, 46 and 27 Fokontany were selected from rural and urban areas respectively, and in each selected Fokontany, 30 households were selected randomly.

The calculation of sample size required for this study is based on the fact that its main aim is to produce dashboard tables, namely for monitoring, evaluation, and segmentation purposes. Each table requires a specific approach to computing sample size. Therefore, the maximum of the three was taken as sample size for the study. Using results from simulations from the formula, and taking into account financial constraints. Thus, a sample of 2,138 and 2,559 eligible women were recruited for the baseline (October/November 2004) and the follow-up (October/November 2006) respectively.

Data Collection Procedure Women were interviewed at home by PSI Madagascar interviewers, in October-November 2004 for the baseline, and in October-November 2006 for the follow-up. A maximum of three visits (an initial visit plus two call-backs for households that were closed at the first or second visit or where the interviewer failed to secure informed consent at first or second visit) were made to each selected house. A face to face interview was conducted by trained health workers after obtaining informed consent.

PSI/Madagascar research team is responsible for the data collection. A team composed of 9 supervisors and 35 interviewers carried out the data collection.

Interviewers are in charge of completing interviews and supervisors are in charge of ensuring data quality. The supervisor proceeded to the control of the information collected every day during the filed work. Supervisors reviewed interviews to verify whether they are conducted correctly or not, and interviewers returned to the respondent if the supervisors note an error in the data. Supervisors also must verify with household members to ensure that the interviewers had spoken with the interviewee selected in the household monitoring sheet.

PDAs (personal digital assistants) were used for the follow-up data collection. It allows data entry at the same time as the interviewing and this tool includes automatic data quality control (automatic skip patterns and filters, automatic check for internal consistency, range checks, logical checks and so on). Each interviewer used one PDA and carried the few accessories needed for it (additional battery, charger, etc).

Survey Instrument(s) The questionnaire includes questions on socio-demographic variables, behaviors (use of insecticide treated net), determinants of behavior or bubbles and exposure to PSI interventions. The questionnaire was translated into the local language. Each perception was measured through multiple scale items for which responses were on a Likert-type four point scale anchored with "1" strongly disagree" and 4 "strongly agree".

The questionnaire was pre-tested by conducting about 20 practices with women between 15 and 49 years old in Tananarivo. The questionnaire was revised according to the input from the pre-test. After that, a pilot study was conducted with 100 respondents in Tananarivo and in Moramanga (one region of Tamatave's province) to assess the dimensionality and reliability of

the scales. Factor analysis was used to check the dimensionality of scales and item analysis was used to assess the reliability of scales. The questionnaire was changed based on the findings from these analyses. Some questions were removed in order to reduce the duration of the interview. Besides, some questions were reformulated to have sentences more comprehensible at the first reading. Lastly, the skip patterns and filters; the check for internal consistency, range checks, and logical checks were revised according to the aforementioned change.

Analytic Technique Correlation analysis was used to detect multi-collinearity and to check the dimensionality of scales. Item analysis was used to assess the reliability of scales. Some variables were dropped in that analysis. The monitoring table is produced based on a combined data set from both survey rounds. Means were reported using UNIANOVA in SPSS; separate models were run in which the variable of interest was the outcome and controls were age, level of education, socio-economic status, and marital status. The segmentation model was based on multiple logistic regression in which explanatory variables were dropped if found not to significantly contribute to explanation of the variance. Adjusted means or proportions were presented for explanatory variables which remained in the final logistic regression model, adjusting for all other explanatory variables in the model. The evaluation table categorizes exposure in terms of low (recognized the message and was exposed to 0-2 channels), medium (recognized the message and was exposed to 3-18 channels) and high (recognized the message and was exposed to 18+ channels). Separate UNIANOVA models in SPSS in which indicators in each row were outcome variables, exposure was the explanatory variable of interest, and controls were the same as those in the monitoring table. Significance is based on an LSD test with a 0.05 limit on the family-wise error rate.

Reliability Analysis

| Composite variables	2004 (N=1402) Cronbach's Alpha	2006 (N=1556) Cronbach's Alpha
OPPORTUNITY		
Availability (1: Strongly disagree; 4: strongly agree): - *Treated mosquito nets are difficult to find in your community (r)* - *Insecticide treated mosquito nets are available at the pharmacy* - *Insecticide treated mosquito nets are available at the retail outlet close to here any time of the year* - *You have seen Insecticide treated mosquito nets the last time you were at one grocery store* - *There is a suitable Insecticide treated mosquito nets sales place close to here* - *You can find Insecticide treated mosquito net in sales place close to here* - *You know a place which sells Insecticide treated mosquito net* - *Super Moustiquaire is easy to find in your community* - *Super Moustiquaire is always available at the retail outlet close to here any time of the year* - *You have seen Super Moustiquaire the last time you were at one grocery store*	.853	.847
ABILITY		
Knowledge (1: Strongly disagree; 4: strongly agree): - *Convulsion is a sign of a serious malaria* - *Malaria is only transmitted by mosquitos* - *Lack of appetite is a malaria symptom* - *Malaria is caused by fatigue(r)* - *It is necessary to sleep under mosquito net every night all year round to prevent from malaria* - *The consciosness disorder is a serious malaria symptom* - *Malaria is caused by climate change(r)* - *To prevent from malaria, it is necessary to avoid mosquitos bites* - *Sleeping under a mosquito net every night can reduce malaria transmission* - *Fever without obvious reason is a symptom of malaria* - *Malaria is transmitted by green fruit consumptions(r)* - *It is necessary to treat malaria for less than 24 hours after the fever apparition* - *It is necessary to take the child to a health care center in case of serious malaria* - *Articulation pains are symptoms of malaria* - *Thrills are symptoms of malaria* - *Perspiration is a symptom of malaria* - *It is necessary to finish the malaria treatment even though the child's state gets improved at the beginning of the treatment* - *It is dangerous to wait to treat malaria for a child* - *Persistent vomiting is a serious malaria symptom*	.754	.737
MOTIVATION		
Outcome Expectation(1: Strongly disagree; 4: strongly agree): - *Using an insecticide treated mosquito net is one way to avoid malaria* - *Insecticide treated mosquito net is the best way to avoid malaria* - *Insecticide treated mosquito net is effective to avoid malaria* - *Insecticide treated mosquito net is effective to eliminate mosquitos and insects* - *Insecticide treated mosquito net is efficient to reduce numbers of mosquitos and insects bites* - *Insecticide treated mosquito net can give a good sleep (used in 2006)*	.805	.780
Threat(1: Strongly disagree; 4: strongly agree): - *A child less than 5 years old can die of malaria* - *Your children less than 5 years old are at risk to die if you don't precociously treat them in case of malaria* - *Malaria is a serious disease* - *You are afraid that your child less than 5 years old will get very sick in case of malaria* - *Malaria can cause spontaneous abortion for pregnant women* - *Malaria can cause prematured birth for pregnant women* - *Malaria can cause the birh of a still born baby for pregnant women* - *Malaria can cause the birth of a weak weight baby for pregnant women* - *Malaria can cause serious consequences for pregnant women*	.871	.847

Belief(1: Strongly disagree; 4: strongly agree): - *Insecticide treated mosquito net provoke coughing (r)* - *Insecticide treated mosquito can choke babies (r)* - *To sleep under a white mosquito net makes think about deaths (r)* - *Insecticide on insecticide treated mosquito net has some noxious effects on health (r)* - *It is necessary to only use insecticide treated mosquito net during rainy seasons (r)* - *Mosquitos can cross through insecticide treated mosquito net stitches (r)* - *Sleeping under insecticide treated mosquito net is too hot (r)* - *The smell of an insecticide treated mosquito net is unpleasant (r)* - *Insecticide treated mosquito net get easily damaged (r)*	.803	.762

r: reverse coded

Performance Framework for Social Marketing
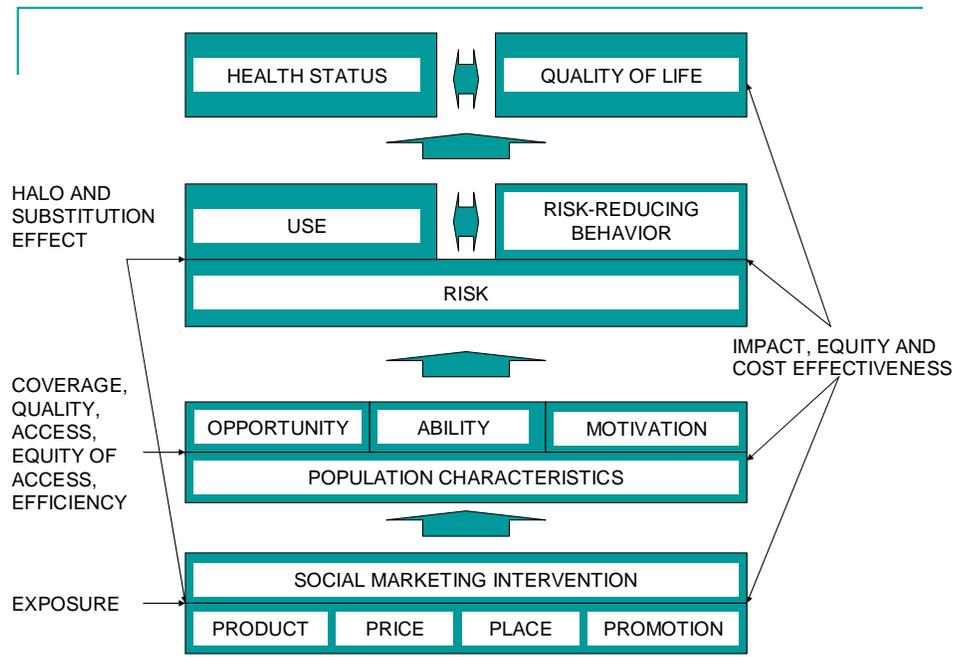
This study design is guided by PSI's PERForM framework. PERForM describes the social marketing research process, identifies key concepts important for designing and evaluating social marketing interventions and mirrors the four levels and concepts in the logical framework.

The top level consists of the goal of social marketing for any health promotion intervention, namely improved health status and/or for interventions relating to coping with sickness or disability, quality of life.

The second level consists of the objectives of social marketing stated as product or service use on the left side and/or other risk-reducing behaviours that do not involve the use of a product or service on the right side. The adoption or maintenance of these behaviours in the presence of a given risk or need for health services is causally antecedent to improving or maintaining health and or quality of life.

The third level consists of the determinants of PSI Behaviour Change framework summarised in terms of opportunity, ability and motivation that may differ by population characteristics such as age and sex. The fourth level consists of the characteristics of the social marketing intervention.

References

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