



**Tanzania (2008) Malaria Prevention among
Children Under Age Five in Tanzania**

Second Round.

T h e P S I D a s h b o a r d

**Dar es Salaam, Tanzania
September, 2008**

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Summary

Background & Research Objectives: This is PSI/Tanzania's second TRaC survey round, and measures several indicators related to the health of children under-five nationwide with respect to malaria. In addition to providing a means of tracking the change in key indicators, this report also includes segmentation analysis, i.e. dividing the at-risk population into those that perform the desired behaviors and those who do not, in order to focus on those factors that make these two groups different. This report also provides an exposure evaluation of the impact of PSI/Tanzania communications by correlating behavior, and scores for *Opportunity*, *Ability* and *Motivation* (OAM) factors potentially affecting that behavior, to varying levels of exposure.

Description of Intervention: PSI/Tanzania is working to prevent malaria through the distribution and promotion of ITNs and the social marketing of *Ngao* insecticide treatment kits. Through behavior change communication PSI/Tanzania aims to provide powerful community based behavior change communications (BCC) strategies to malaria to change and improve awareness of malaria prevention and management in Tanzania with focus to the disadvantaged areas (rural areas) through community-initiated activities, trained community change agents and supported by External Rural Engagement (ERE).

Methodology: The sample size for the principal caregivers of children under five was N=1821, distributed across regions and districts through a multistage random sampling (Probability Proportional to Size- PPS). The first households were selected randomly and the rest systematically depending on the availability of a child under the age of five. Data collection took place from March to early May of 2008 through face-to-face interviews. PDAs were used to collect data in order to eliminate enumerator errors, lengthy data-entry and data cleaning and ultimately ensure a high-quality dataset. Data collectors received two weeks of training on research ethics, methodology, sample selection and the use of PDAs. The survey instrument was a Kiswahili questionnaire, which was pre-tested with 200 respondents. The data was analyzed in SPSS 16.

Main Findings:

The monitoring table highlights that:

- The ownership of any net in all households has significantly decreased from 82% in 2007 to 75% in 2008.

- Among children under five, any net use in the previous night (among those owning net) has decreased from 74% in 2007 to 64% in 2008.
- Net treatment (among those who owns nets) has decreased from 44% in 2007 to 37% in 2008.
- All measured OAM factors, including perceived availability of nets, self-efficacy for malaria prevention and perceived threat dropped significantly between 2007 and 2008.

The results of segmentation analysis indicate that;

- The ownership of nets is affected by availability, knowledge, self efficacy, and product attributes. Those who own nets are more likely to have higher knowledge, higher self efficacy, and to perceive higher availability of nets and Ngao as compared to those who do not own nets.

Exposure evaluation analysis indicates that;

- Those with higher levels of exposure to Mobile Video Units (MVU) and road shows are more likely to own at least one bed net, compared to those with no exposure.
- Perceived availability of Ngao was higher among those exposed compared to those unexposed.
- Similarly, exposure to MVU and roadshows is also correlated with a child under five sleeping under any net previous night, among those who own a net.
- The decision to treat a net is not associate the exposure to any of the PSI interventions, exposure to MVU and road show has no direct relationship with net treatment.

Programmatic Recommendations:

In order to increase the adoption of Malaria prevention behaviors (i.e. net ownership, net use and net treatment), PSI/Tanzania should focus on;

- Improving product *availability* (and/or perceived availability), enhancing *self-efficacy* (caregivers' confidence in their ability to protect their families), and increasing the perception of *threat* from Malaria (both the susceptibility of pregnant women and children under five, and the severity of its consequences).
- To effectively improve communication PSI/Tanzania should improve its communication approach (develop more targeted messages) in order to effectively influence the promoted behavior; this may include revising and improving quality of messages targeting the population in target.

Monitoring Table: 1 Results regarding behavior to the prevention of Malaria among caregivers of children under the age of five in Tanzania, 2007 and 2008.

Risk Group: Caregivers of a child under five

Behaviors: Behavior related to the prevention of malaria (2007 N=1571; 2008 N=1821).

| BEHAVIOR/OAM | (2007) N=1571 | (2008) N=1821 | Sig. |
|--|------------------|------------------|------|
| | % | % | |
| Any net ownership (owning at least one net, of all households) ² | 82.3% | 75.1% | *** |
| Any net use by child under five, the previous night (among those owning net) ³ | 74.4% | 64.2% | *** |
| ITN treatment (effective treatment) ⁴ | 44.3% | 37.4% | ** |
| Opportunity | Mean | Mean | |
| Availability, Nets (range 1-4; higher score means higher Nets availability perception) ⁶ | 2.90 | 2.60 | *** |
| Availability, Ngao (range 1-4; higher score means higher Ngao availability perception) ⁶ | 2.85 | 2.34 | *** |
| Attributes, Ngao (range 1-4; higher score means higher attributes Ngao perception) ⁶ | 3.53 | 3.01 | *** |
| Ability | Mean | Mean | |
| Self-efficacy for Malaria prevention(range 1-4; higher score means higher self-efficacy- Malaria prevention) ⁶ | 3.66 | 3.34 | *** |
| Knowledge (scale of 0-10) | 8.89 | 8.18 | *** |
| Motivation | Mean | Mean | |
| Threat –Severity | | | |
| • Malaria can prevent me from working and earning money | 2.06 | 1.11 | *** |
| • Malaria can prevent my children from attending school | 2.14 | 1.08 | *** |
| • Treating Malaria can be expensive | 2.82 | 1.35 | *** |
| Population Characteristics | Mean | Mean | |
| Media Access (scale of 0-100) | 18% | 25% | *** |
| Exposure variables | % | % | |
| Ever seen PSI MVU shows | 40 | 20 | * |
| Ever seen PSI Roadshow | 31 | 11 | NS |
| Ever heard of treated nets | 89 | 85 | ** |
| Ever seen or heard advertising for NGAO | 83 | 94 | *** |

² N= 1571 (baseline); N=1821 (follow-up)

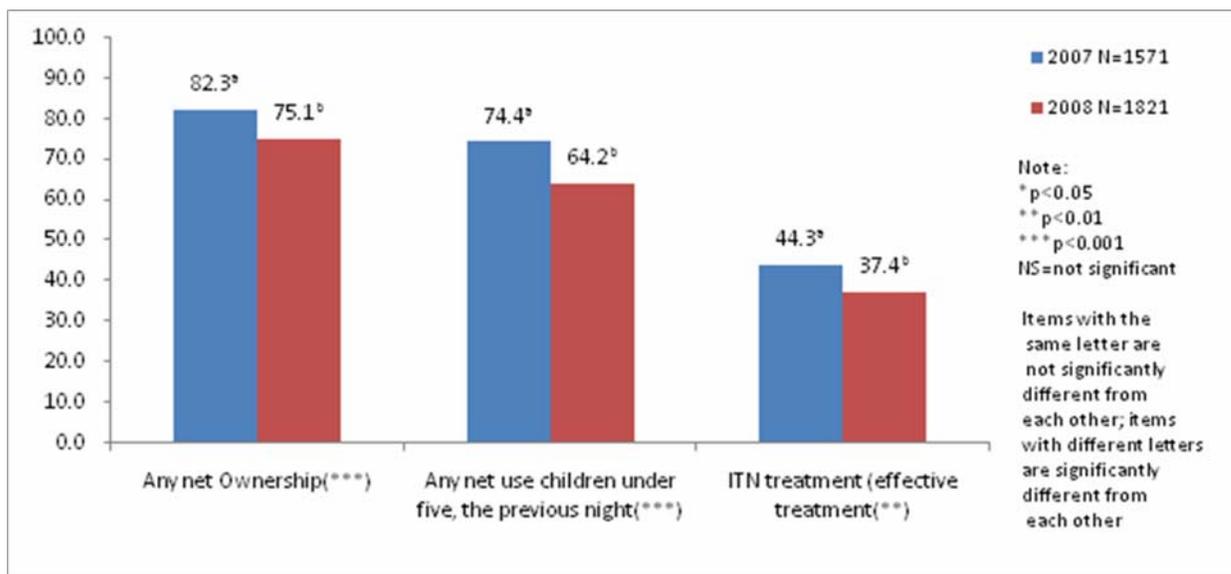
³ N=1293(baseline); N=1365 (follow –up)

⁴ N=1099(baseline); N=833 (follow –up)

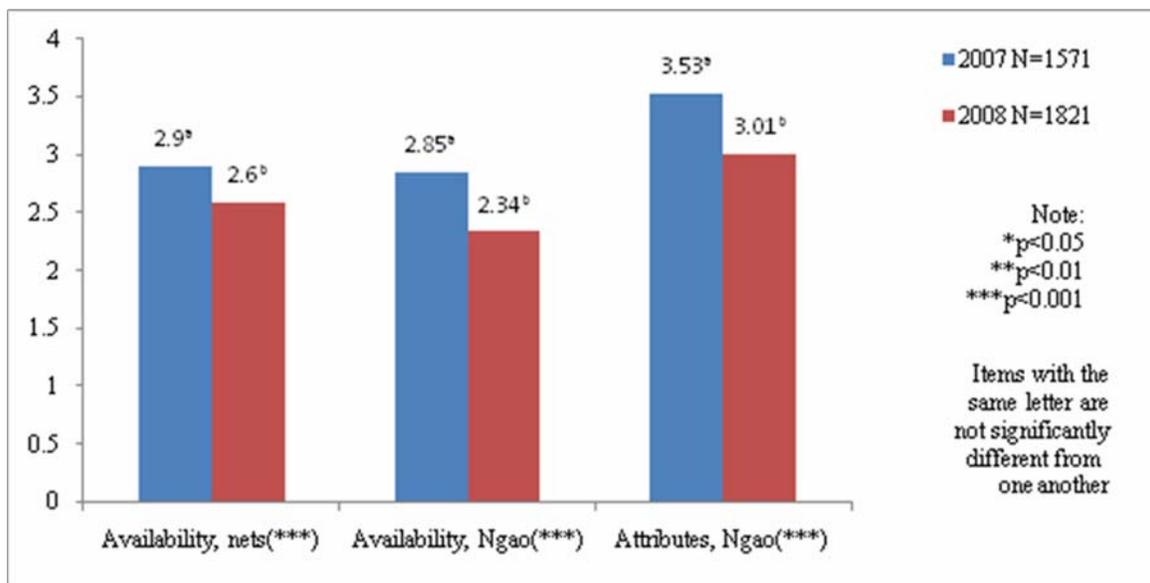
⁵ N=1219(baseline); N=1306 (follow –up)

Mean score ranges from 1= strongly disagree, 2= disagree 3= agree 4= strongly agree. Scale items included listed in the Annex

Monitoring Graph 1: Trends over time (%) key indicators to the prevention of Malaria among caregivers of children under the age of five in Tanzania, 2007 and 2008



Monitoring Graph 2: Trends over time in determinants to the prevention of Malaria among caregivers of children under the age of five in Tanzania, 2007 and 2008



Segmentation table: 1 Results regarding determinants of net ownership among caregivers of children under the age of five in Tanzania, 2007 and 2008.

Risk Group: Caregivers of children under five.

Behavior: Any net ownership

| N = 1821 | Owning net N=1390 (76%) | Not owning net N=431 (24%) | ORs | Sig. |
|--|-------------------------------|-------------------------------------|------|------|
| Population Characteristics | Mean | Mean | | |
| Social economic status(Low quartiles Vs High quartiles) | 3.10 | 3.31 | 0.82 | *** |
| | % | % | | |
| Education (Secondary and above is Ref Vs. Primary or None) | 91% | 86% | 1.50 | ** |
| Marital Status(Married Vs. Single) | 80% | 73% | 1.43 | ** |
| Media Access (scale of 0-100) (Exposed to media Vs. not exposed to media) | 36% | 29% | 1.21 | *** |

Mean scores for scales/ items range (1-4): Strongly disagree (1), Disagree somewhat (2), Agree somewhat (3), and strongly agree (4).

* $p < .05$, ** $p < .01$ *** $p < .001$ '-' = Not significant

Hosmer & Lemeshow test; 0.028

Chi square= 183.08,

Block significance= <0.000

Nagelkerke R Square; 0.162

Cox & Snell R Square; 0.104

Segmentation table: 2 Results regarding determinants of net treatment among caregivers of children under the age of five in Tanzania who owns nets, 2007 and 2008.

Risk Group: Caregivers of children under five among those who owns nets.

Behavior: Ever treated a net (*any time*)

| N = 1382 | Treated Net N=873 (63%) | Never Treated N=509 (37%) | ORs | Sig. |
|--|-------------------------------|---------------------------------|------|------|
| Ability | Mean | Mean | | |
| Knowledge (scale of 0-10) | 8.4 | 8.1 | 1.09 | ** |
| Population Characteristics | | | | |
| Age | 28.65 | 29.45 | 0.98 | * |
| Education (Secondary and above is Ref Vs. Primary or None) | 93% | 89% | 1.51 | * |
| Marital Status(Married Vs. Single) | 82% | 77% | 1.28 | * |
| Christian(Christian Vs. non-Christian) | 51% | 46% | 1.24 | * |
| Media Access (scale of 0-100) (Exposed to media Vs. not exposed to media) | 65% | 49% | 19.0 | *** |

Mean scores for scales/ items range (1-4): Strongly disagree (1), Disagree somewhat (2), Agree somewhat (3), and strongly agree (4).

* $p < .05$, ** $p < .01$ *** $p < .001$ '-' = Not significant

Hosmer & Lemeshow test; 0.20

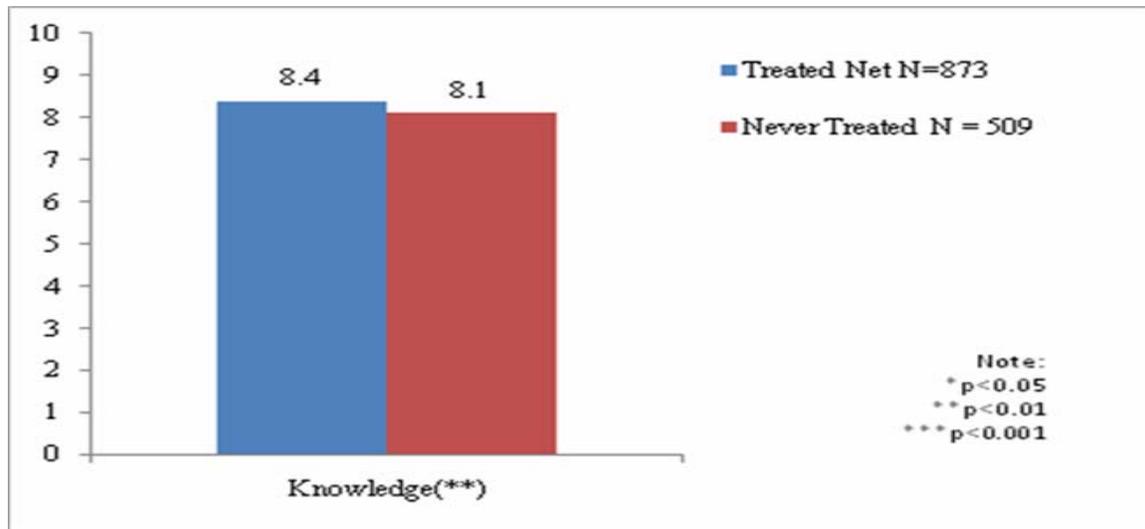
Chi square= 21.126,

Block significance= <0.000

Nagelkerke R Square; 0.166

Cox & Snell R Square; 0.121

Segmentation Graph 2: Behavioral Determinants of Net Treatment among caregivers of children under the age of five in Tanzania, 2007 and 2008



Evaluation Table: 1 Association between exposure¹ to the PSI-sponsored intervention and Net Ownership among caregivers of children under the age of five in Tanzania, 2007 and 2008

Risk Group: Caregivers of children under five

Behavior: Net Ownership

| N=2951 | | | | |
|---|-----------------------------|---|---|------|
| INDICATORS | 2007 Baseline N=941 % | Follow –up 2008 Not exposed N=1519 % | Follow-up 2008 Exposed N=491 % | Sig. |
| Own at least one net, of all households | 77.0 ^a | 77.1 ^a | 81.3 ^c | * |
| Opportunity | Mean | Mean | Mean | |
| Availability, Nets | 2.80 ^a | 2.36 ^b | 2.39 ^b | *** |
| Availability, Ngao | 2.68 ^a | 2.58 ^b | 2.91 ^c | *** |
| Brand Attributes, Ngao | 3.39 ^a | 1.95 ^b | 2.05 ^b | *** |
| Ability | Mean | Mean | Mean | |
| Self-efficacy for Malaria prevention | 3.57 ^a | 1.62 ^b | 1.74 ^c | *** |
| Knowledge (scale of 0-10) | 9.02 ^a | 8.21 ^b | 8.11 ^b | *** |
| Motivation | Mean | Mean | Mean | |
| Threat-Severity | | | | |
| • Malaria can prevent me from working and earning money | 3.00 ^a | 1.16 ^b | 1.17 ^b | *** |
| • Malaria can prevent my children from attending school | 2.92 ^a | 1.14 ^b | 1.18 ^b | *** |
| • Treating Malaria can be expensive | 2.29 ^a | 1.38 ^b | 1.46 ^b | *** |

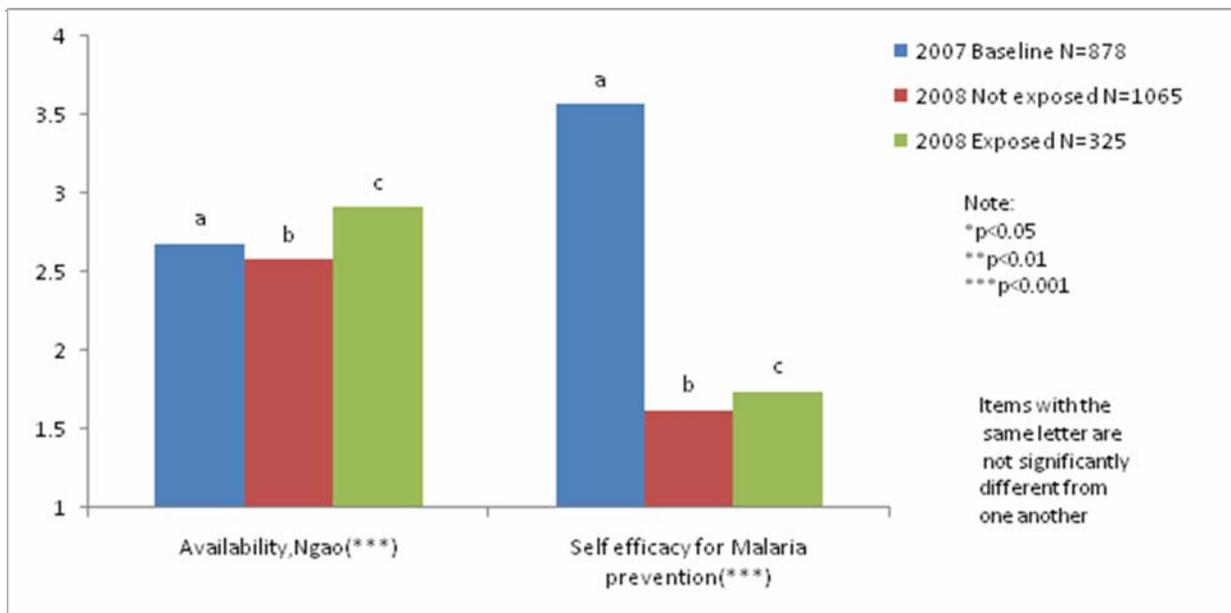
a, b, c: Proportions and means with different superscripts are significantly different at $p < 0.05$ or better; proportions and means with the same superscript are not significantly different.

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: Results of UNIANOVA analysis are shown, with controls including socio-demographic variables education, religion, marital status and media access.

¹ Exposure was measured as follows: (1) the reference group consisting of respondents of the baseline study; (2) the "not-exposed" group includes respondents who reported no contacts with PSI-MVU shows and ROAD shows during the follow-up study; (3) the "Exposed" group are those who ever seen and attended the PSI-MVU and ROAD shows on.

Evaluation Graph 1: Association between PSI sponsored Interventions and determinants of Net Ownership among caregivers of children under the age of five in Tanzania, 2007 and 2008



Exposure Table: 2 Association between exposure² to the PSI-sponsored intervention and Net Use among caregivers of children under the age of five in Tanzania who owns net, 2007 and 2008

Risk Group: Caregivers of children under five

Behavior: Net Use among children under five.

| N=2269 | | | | |
|---|-----------------------------|---|---|------|
| INDICATORS | 2007 Baseline N=878 % | Follow -up 2008 Not exposed N=1065 % | Follow-up 2008 Exposed N=325 % | Sig. |
| Child under five slept under any net previous night, among those who owns a net | 68.0 ^a | 81.2 ^b | 85.0 ^b | *** |
| Opportunity | Mean | Mean | Mean | |
| Availability, Nets | 2.80 ^a | 2.37 ^b | 2.29 ^b | *** |
| Availability, Ngao | 2.68 ^a | 2.60 ^b | 2.92 ^a | *** |
| Brand Attributes, Ngao | 3.39 ^a | 1.97 ^b | 2.06 ^c | *** |
| Ability | Mean | Mean | Mean | |
| Self-efficacy for Malaria prevention | 3.57 ^a | 1.62 ^b | 1.73 ^c | *** |
| Knowledge (scale of 0-10) | 9.00 ^a | 8.19 ^b | 8.13 ^b | *** |
| Motivation | Mean | Mean | Mean | |
| Threat -Severity | | | | |
| • Malaria can prevent me from working and earning money | 2.98 ^a | 1.18 ^b | 1.77 ^b | *** |
| • Malaria can prevent my children from attending school | 2.90 ^a | 1.15 ^b | 1.19 ^b | *** |
| • Treating Malaria can be expensive | 2.28 ^a | 1.39 ^b | 1.51 ^b | *** |

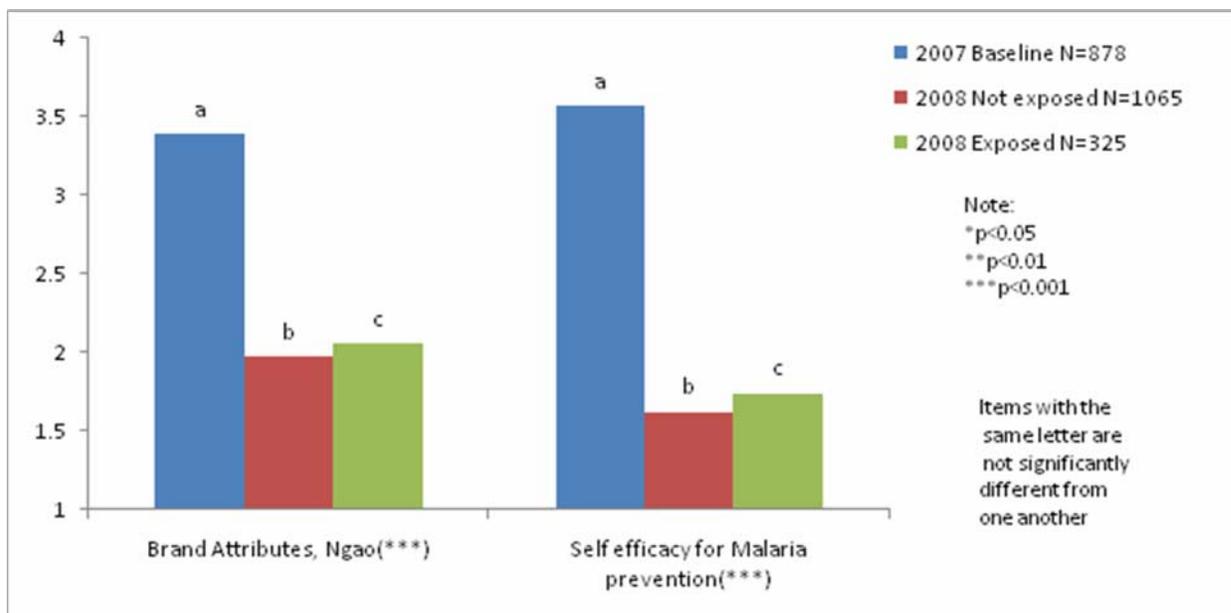
a, b, c: Proportions and means with different superscripts are significantly different at $p < 0.05$ or better; proportions and means with the same superscript are not significantly different.

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: Results of UNIANOVA analysis are shown, with controls including socio-demographic variables education, religion, marital status and media access.

² Exposure was measured as follows: (1) the reference group consisting of respondents of the baseline study; (2) the "not-exposed" group includes respondents who reported no contacts with PSI-MVU shows and ROAD shows during the follow-up study; (3) the "Exposed" group are those who ever seen and attended the PSI-MVU and ROAD shows on.

Evaluation Graph 2: Association between PSI sponsored Interventions and determinants of Net Use among children under the age of five in Tanzania, 2007 and 2008



Exposure Table: 3 Association between exposure³ to the PSI-sponsored intervention and Net Treatment among caregivers of children under the age of five in Tanzania who owns nets, 2007 and 2008

Risk Group: Caregivers of children under five.

Behavior: Net Treatment.

| N=2268 | | | | |
|---|-----------------------------|---|---|------|
| INDICATORS | 2007 Baseline N=878 % | Follow –up 2008 Not exposed N=1065 % | Follow-up 2008 Exposed N=325 % | Sig. |
| Ever treated a net ,among those who owns a net | 85.0 ^a | 64.0 ^b | 51.0 ^c | *** |
| Opportunity | Mean | Mean | Mean | |
| Availability, Nets | 2.80 ^a | 2.37 ^b | 2.39 ^b | *** |
| Availability, Ngao | 2.68 ^a | 2.60 ^b | 2.93 ^a | *** |
| Brand Attributes, Ngao | 3.39 ^a | 1.97 ^b | 2.06 ^c | *** |
| Ability | Mean | Mean | Mean | |
| Self-efficacy for Malaria prevention | 3.57 ^a | 1.62 ^b | 1.73 ^c | *** |
| Knowledge (scale of 0-10) | 9.01 ^a | 8.19 ^b | 8.14 ^b | *** |
| Motivation | Mean | Mean | Mean | |
| Threat –Severity | | | | |
| • Malaria can prevent me from working and earning money | 2.98 ^a | 1.77 ^b | 1.77 ^b | *** |
| • Malaria can prevent my children from attending school | 2.90 ^a | 1.15 ^b | 1.19 ^b | *** |
| • Treating Malaria can be expensive | 2.28 ^a | 1.39 ^b | 1.51 ^b | *** |

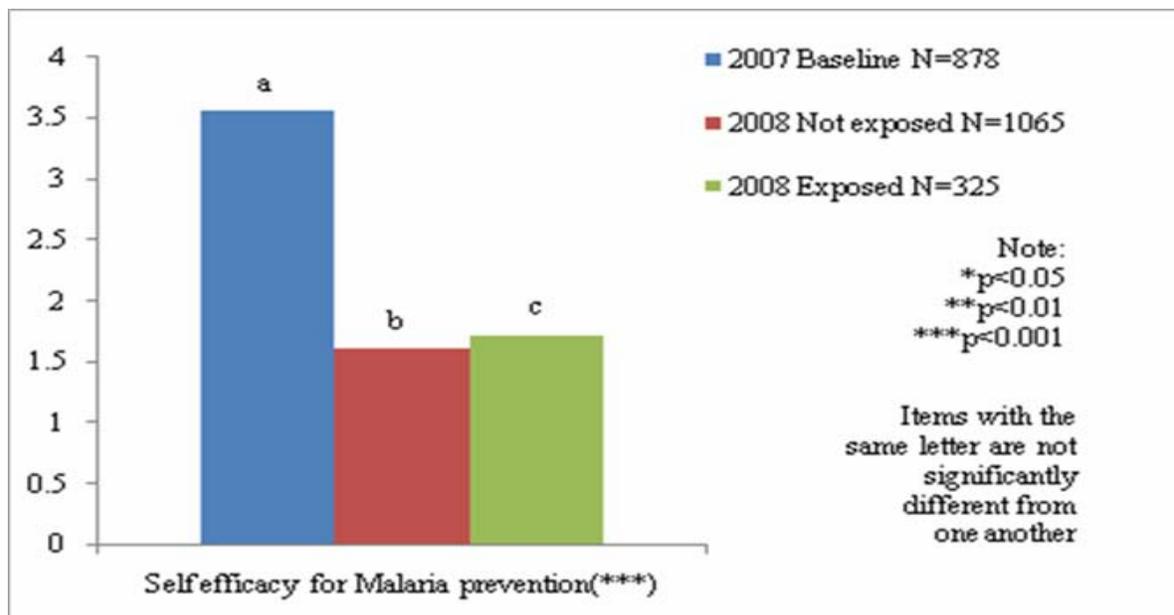
a, b, c: Proportions and means with different superscripts are significantly different at $p < 0.05$ or better; proportions and means with the same superscript are not significantly different.

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: Results of UNIANOVA analysis are shown, with controls including socio-demographic variables education, religion, marital status and media access.

³ Exposure was measured as follows: (1) the reference group consisting of respondents of the baseline study; (2) the "not-exposed" group includes respondents who reported no contacts with PSI-MVU shows and ROAD shows during the follow-up study; (3) the "Exposed" group are those who ever seen and attended the PSI-MVU and ROAD shows on.

Evaluation Graph 3: Association between PSI sponsored Interventions and determinants of Net Treatment among caregivers of children under the age of five in Tanzania, 2007 and 2008



Summary table of program effect

The summary table combines the results from the monitoring and evaluation tables to aid in the interpretation of possible program effect. The monitoring column shows the direction of the indicator as observed on the monitoring table. The evaluation column shows the difference between follow-up not exposed and follow-up high exposure categories, as shown in the Evaluation table.

| BEHAVIOR/OAM | Change over time(Monitoring) | Association with program Exposure(Evaluation) | Programmatic Effect |
|---|------------------------------|---|---------------------|
| | TREND | TREND | |
| INDICATORS | | | |
| Any net ownership | - | + | + impact |
| Child under five slept under any net previous night, among those who owns a net | - | Non-significant | No impact |
| Net treatment | - | - | - impact |
| Opportunity | | | |
| Availability, Nets | - | - | No impact |
| Availability, Ngao | - | + | + <i>impact</i> * |
| Brand Attributes, Ngao | - | - | No impact |
| Ability | | | |
| Self-efficacy ,Malaria for prevention | - | - | No impact |
| Knowledge (scale of 0-10) | - | - | No impact |

* *Positive impact relates only to 'net ownership' evaluation, and not other two evaluations.*

| POPULATION CHARACTERISTICS | 2007 N=1571 | 2008 N=1821 |
|--|------------------------|------------------------|
| <i>Indicator</i> | % or mean | % or mean |
| <i>Type of settlement</i> | | |
| <i>Rural</i> | 87 | 74 |
| <i>Urban</i> | 13 | 26 |
| | Mean | Mean |
| <i>Mean age</i> | 29 | 26 |
| <i>Marital status</i> | % | % |
| Single/never married | 12 | 9 |
| Widowed/divorced/separated | 10 | 14 |
| Married, monogamous | 73 | 74 |
| Married, polygamous | 5 | 3 |
| <i>Highest level of education</i> | | |
| None | 12 | 9 |
| Primary incomplete | 14 | 10 |
| Primary complete | 67 | 67 |
| Secondary or higher | 7 | 14 |
| <i>Religious denomination</i> | | |
| None | 1 | 1 |
| Muslim | 34 | 33 |
| Catholic Christian | 38 | 31 |
| Lutheran | 6 | 16 |
| Other Christian | 21 | 19 |

Reliability Analysis

| Behavior Change Determinants(Malaria) | Study | |
|---------------------------------------|------------------|--|
| | Cronbach's Alpha | Items |
| OPPORTUNITY | | |
| Availability, Nets | 0.86 | 1.I know where I can get a mosquito net 2.Mosquito nets are always available close by 3.Mosquito nets are easily available 4.Mosquito nets are easily available through street vendors (machingas) 5.I can easily get a mosquito net from a shifting market 6.I can easily get a mosquito net from a shop within my village/ neighborhood 7.I can easily get a mosquito net from a clinic 8.I can easily get a mosquito net from an NGO |
| Availability, Ngao | 0.92 | 1.I can find Ngao whenever I need to treat my net 2.Ngao is available within a short walk of my house 3.Ngao is always available at a shop in my neighborhood 4.Ngao is as easy to find as soap 5.I can easily get Ngao from a shifting market 6.I can easily get Ngao from street vendors (machingas) |
| Brand Attributes: Ngao | 0.92 | 1. Instructions for Ngao are easy to follow 2. It is easy to treat a net with Ngao 3. Ngao treatment is effective for a long time 4. Ngao is unsafe/harmful to use 5. Ngao kills Malaria mosquitoes better than other mosquitoes 6. Ngao is very effective in repelling mosquitoes. |
| ABILITY | | |
| Self -efficacy | 0.88 | 1.I can easily protect myself and my children from Malaria 2.I can ensure that my children sleep under a treated net every single night 3.I can easily hang my net 4.I can save up the money to buy a net 5.I can easily use Ngao to treat my net |
| MOTIVATION | | |
| Beliefs , Malaria | 0.72 | 1.It is important to sleep under a net every single night 2.Exposure to the sun can cause Malaria 3.Exposure to the rain can cause Malaria 4.Eating unripe mango can cause Malaria 5.Eating unripe maize/corn can cause Malaria 6.All mosquitoes transmit Malaria |
| Intentions | 0.88 | 1.I intend to make sure that all my children under five sleep under a treated net 2.I intend to make sure that any pregnant woman in the household will sleep under a treated net 3.I intend to buy Ngao this year to treat my net(s) 4.I intend to get enough nets to protect my entire household |
| Threat: Susceptibility | 0.70 | 1.Malaria is a major health problem in my community 2.Children under-five are at very high risk of getting Malaria 3.Pregnant women are at high risk of getting Malaria |