



**Zambia (2007): Malaria TRaC Study
Evaluating the Use of Insecticide Treated
Nets Among Women.**

Round Two

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Table of Contents

Summary	4
Acknowledgements:	4
Background and Research Objectives:	4
Description of Intervention:	4
Methodology:.....	4
Main Findings:	5
Programmatic Recommendations:	5
Situation of Malaria in Zambia	7
SFH Advertisement and Promotion	7
Purpose of the TRaC Study.....	9
Monitoring Table	11
Monitoring Analysis	14
Segmentation Table	15
Segmentation Analysis:	18
Evaluation Tables and Analysis:.....	19
Program Recommendations	21
Appendix 1: Population Characteristics.....	23
Appendix 2: Methodology.....	24
Appendix 3: Reliability Analysis.....	27
Appendix 4: Performance Framework for Social Marketing.....	30
Appendix 5: References.....	32

Summary

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Background and Research Objectives: PSI's objective is to improve the health of poor people through behaviour change communication and by using the private sector to deliver health products at affordable and subsidized prices. SFH Zambia aims to decrease prevalence of malaria by undertaking activities such as promotion of insecticide treated nets (ITNs) through behaviour change communications. TRaC surveys provide actionable evidence for social marketing decisions making as well as helping to measure the impact of various project intervention and activities. Between August and October 2007, Society for Family Health (SFH) conducted a household survey designed to investigate the changes in the use of Insecticide Treated Nets (ITN) and behavioural indicators among pregnant women since 2005, the determinants of ITN use, and the impact of SFH's ITN program activities. This survey was a follow-up to a baseline survey that was conducted in 2005.

Description of Intervention: SFH Zambia promotes the use of long lasting insecticide treated mosquito nets as the major component of its malaria prevention programme. ITN use is mainly targeted towards women who are most vulnerable to getting malaria. Society for Family Health (SFH) is mainly using social marketing to motivate behaviour change with respect to sleeping under an ITN. The SFH behaviour change programmes and activities are guided by evidence from research.

Methodology: The study is based on a representative sample of 1670 women aged 15-49 living in Zambia. Face to face individual interviews were conducted to collect the data. Female respondents, aged 15-49, were randomly sampled from households in all of Zambia's 9 provinces. The analysis included logistic regression to identify determinants of the desired behaviour. The evaluation analysis was based on two cross sectional survey rounds (September 2005 and August to October 2007). Results are presented in standard PSI Dashboard form.

Main Findings:

The monitoring analysis shows that the percentage of women who reported sleeping under an ITN the night before the survey significantly increased from 34% in 2005 to 41% in 2007. The percentage of rural women sleeping under an ITN the night before the survey increased significantly from 29% in 2005 to 53% in 2007. The study further found that the percentage of pregnant women reported sleeping under an ITN throughout the year increased from 27% in 2005 to 49% in 2007. Net ownership has significantly increased. The percentage of rural households owning at least one increased from 56% in 2005 to 73% in 2007. Among these, 29% reported that they owned more than one ITN in 2007 as compared to 23% in 2005. Knowledge of ITN as the most effective personal method to prevent malaria significantly increased from 44% to 66% during the same time period. For ITN use among women aged 15-49, availability, knowledge, beliefs and outcome expectation emerged as significant determinants. While for ITN use among pregnant women, availability, knowledge, beliefs and perceived severity emerged as significant. SFH mass media communications were found to have a positive impact on ITN use. Those with high exposure were more likely to have used an ITN as compared to those with low exposure. About 88% of those with high exposure to SFH communications reported that women in their household sleeping under an ITN throughout the year as compared to 68% of those with no exposure. Exposure to SFH communications is also correlated with increasing risk perception and the belief that ITN as the most effective personal method to prevent malaria.

Programmatic Recommendations: The results indicate positive trends in health behaviour, knowledge and awareness since the 2005 survey and provide evidence of the effectiveness of social marketing programs in promoting better health practices. The findings suggest that availability, knowledge, positive beliefs, perceived severity and outcome expectation were found to be significant determinants for ITN use. It would be best to design communication intervention that would address the above drivers as these determinants were found to be significant for ITN use. Programmes and activities should focus on increasing the availability of ITN. Knowledge was found to be significant determinant of ITN use. An intervention addressing knowledge gaps related to causes of malaria and ways through which malaria can be prevented. Positive outcome expectations are a significant driver of mosquito net use. The programme should promote the benefits of mosquito net use in order to improve perceived outcome expectation. Prevention messages should concentrate on improving awareness of ITN and affirming that ITN are the best effective method of preventing malaria. Additionally, improved attention need to be paid on the personal risk perception. For

programmatic messaging, it may be worthwhile to tap into this perception that malaria is a problem in the community and pregnant women are more at risk of getting malaria as a key reason for the importance of pregnant women should sleep under an ITNs throughout the year. Interventions should also target those in the lower socio-economic groups.

Situation of Malaria in Zambia

Malaria is a major public health problem in Zambia. It is one of the leading causes of morbidity and the second highest cause of mortality in the general population and children in particular (NMCC/CBOH, 2000). It has traditionally been regarded as a rural health problem. However, in recent years the urban and peri-urban populations have been experiencing a growing incidence of malaria. Malaria is accounting for nearly 40% of all outpatient attendances and 50% of cases comprises children under five years of age. While the patterns and rates of transmission vary considerably among regions, the total number of diagnosed cases of malaria was estimated at 4 million including up to 20 percent of maternal mortality in 2003 (NMCC, 2005). The incidence rate for malaria had risen to 396.4 per 1000 population in 2003, a rate equal to one case for every 3 persons (NMCC/CBOH, 2000). The increase in the national malaria incidence is reflected in the increase in the total proportion of outpatient morbidity due to malaria. Although, malaria affects all ages, cases under the age of five are most vulnerable. Children in their first five years of life accounted for 49.3% of hospital admissions (NMCC, 2005) and 47.1% of malaria deaths in 2002 (NMCC, 2000). Recent research in Zambia has shown that malaria has a significant and increasing impact on anaemia and maternal death (MOH, 2001). According to the World Health Organisation, 20% of maternal deaths are attributed to malaria and is one of the important causes for an increase in mortality in sub-Saharan Africa each year. In Zambia, it is estimated that malaria is responsible for nearly 50,000 deaths per year.

Recognizing the importance of malaria as a major cause of morbidity and mortality, the Society for Family Health (SFH), in collaboration with Ministry of Health, has started the social marketing of Insecticide Treated Nets (ITN) in Zambia. The goal of the Social Marketing of Insecticide Treated Nets is to reduce the prevalence of malaria by increasing the knowledge and use of insecticide treated nets particularly among pregnant women and children below the age of five years who are considered to be most vulnerable.

SFH Advertisement and Promotion

SFH developed a communication campaign in collaboration with the National Malaria Control Centre and other partners to educate the population about malaria transmission, malaria prevention and to promote the use of ITNs as the most effective method to prevent malaria. In order to create more awareness of the product, SFH implemented a generic as well as a branded

promotional campaign for the use of ITNs. The intervention concentrated on increasing knowledge levels about malaria transmission, the dangers of malaria in children under five and pregnant women, and the effectiveness of ITNs in preventing malaria. The objective was to create demand and encourage proper use. In addition to fully utilising mass media, SFH expanded many successful interpersonal communication programmes. Drama groups were used in imparting education to the consumers on malaria transmission, prevention, and proper care and use of insecticide net. Peer Education Promoters (PEPs) were also used to educate people about malaria and promote the use of ITNs. Furthermore, detailing programs were used to educate all the health providers and retailers in carrying out ITNs in the catchment areas, providing information, answering questions, etc. Sales agents were trained to educate potential customers as part of these sales efforts. A Child-to-Child school programme was developed to educate teachers and students on malaria transmission and ITN use and to encourage the students to take these messages home to their parents.

Small media and outdoor advertising such as posters, billboards, and brochures/leaflets were also used to promote the availability of ITNs and to promote the benefits of ITN use. These materials use low literacy pictorial images and were written in local languages. Point of Purchase materials like signs, stickers and place cards were used to identify outlets and agents where ITNs are sold, and to promote the product's brand names. Sales agents were given T- shirts and badges to identify them as certified ITN vendors. In addition, promotional materials such as T-shirts, calendars, exercise books and rulers for school children were used to promote awareness of the branded bed net and retreatment logo.

Purpose of the TRaC Study

TRaC (Tracking Results Continuously) surveys are PSI's quantitative research, monitoring and evaluation tool for collecting cross sectional behavioural data. TRaC uses a similar approach to traditional KAP surveys, but is unique in two ways: firstly, it is heavily rooted in the behaviour change framework which is the core of PSI's social marketing and health communications programming; and secondly it is designed with the end use of research findings in mind. Towards that end, it builds upon the '*backwards research process*' where decision-makers first identify the potential decisions that will be based on research findings; this produces the list of indicators or areas of enquiry to be included in the survey. TRaC surveys also differ from standard KAP studies in the way they use psychographic scales to capture the multidimensional and complex concepts that form the *determinants* in PSI's behaviour change framework. The PSI behaviour change framework and Performance Framework for Social Marketing is attached as an appendix.

The purpose of this ITN study was to generate evidence to inform the use of ITN in Zambia. The study focuses on identifying factors that determine or influence ITN use. The study was designed to provide actionable evidence that agencies undertaking ITN interventions in Zambia will use to improve and develop programs. The study also serves to provide more current information following the ITN study conducted in 2005.

Study results are presented in this report in a set of standardized tables for segmentation, monitoring, and evaluation of populations [Patel & Chapman, 2005]. *Segmentation tables* answer the questions, among women aged 15-49, which opportunity, ability and motivation factors and demographic characteristics are correlated with ITN use and, what is the profile of target group segments who do not use ITN? This information is then to be used alongside analysis of societal or infrastructural determinants of and barriers to ITN use, as well as qualitative studies, to develop communications messages which will target the appropriate drivers of ITN use or barriers to use. *Monitoring tables* present levels and trends in key ITN use indicators. This study provides first and second round figures for key ITN use indicators. The *Evaluation tables* indicate the association between ITN use and exposure to SFH's program activities. The differences in desired behaviour between first and second round are assessed and differences are correlated with exposure to interventions. A high level of correlation in a positive direction indicates high program effectiveness.

This study answered questions relating to identification of determinants of ITN use and measurement of key program indicators.

- Which opportunity, ability and motivation constructs and population characteristics are correlated with ITN use?
- Is exposure to SFH activities leading to changes in opportunity, ability, motivation, risks and behaviour?
- How has the proportion of ITN use changed among women aged 15-49 since the last PSI TRaC study conducted in 2005?
- How do the 2007 levels in ITN use behavioural indicators and opportunity, ability and motivation constructs compare to the 2005 levels?

Monitoring Table

Monitoring of populations is the process of assessing levels and trends of behavioral indicators and those relating to opportunity, ability, motivation and exposure to social marketing activities over time in the segmented population. Such monitoring performs several functions. First, it allows program managers, donors and other stakeholders to determine if indicators in the logical framework have changed and whether programmes have achieved their objectives. Second, monitoring trends and rates of change of indicators found to be drivers or inhibitors of behavior in the segmentation exercise is helpful in determining whether these important intermediate outcome measures that are correlated with behavior are changing. Third, monitoring of exposure measures is helpful to social marketers to determine whether the marketing mix has sufficient reach, intensity and duration or, if not, whether changing or stopping the activity is needed (Patel & Chapman, 2004). Fourth, monitoring trends and specifically the speed of those trends informs future project plans in terms of objective setting.

The monitoring tables below present first round and second round data for ITN use and potential determinants of ITN use among a representative sample of women aged 15-49 in Zambia during August/September of 2007.

Table 1: First and second round data on ITN use, determinants of ITN use and exposure to social marketing interventions among women in Zambia, 2005 & 2007

INDICATORS	2005 (N=1725)		2007 (N=1670)		Sig. Level
	% or mean	N if different	% or mean	N if different	
BEHAVIOUR					
Women aged 15-49 slept under a net night before the survey	35.6		52.4		***
Women aged 15-49 slept under an ITN the night before the survey	33.9		41.2		***
Rural women aged 15-49 slept under a net night before the survey	29.1	940	53.2	879	***
Rural pregnant women aged 15-49 who slept under an ITN the night before the survey	28.7	150	39.8	168	***
Pregnant women who report sleeping under an ITN throughout the year	27.4	224	48.7	264	***
Parents who report sleeping under an ITN throughout the year	24.7	749	33.3	840	***
Rural households owning at least one ITN	56.0	940	72.9	879	***
Rural household owning more than one ITN	23.4	940	29.7	879	**
OPPORTUNITY					
Availability: Mean	3.0		3.6		***
Respondents who report that they know where they can buy an ITN: Percent	93.3		94.7		
Brand appeal: Mean	2.4		2.1		
Social Norms: Mean	3.0		3.2		***
ABILITY					
Knowledge: Mean	9.3		9.4		***
Percentage who report that ITNs as the most effective personal method to prevent malaria	44.0		55.9		***
Self Efficacy: Mean	3.5		3.6		**
Percentage of respondents who believe that they can protect themselves from malaria by using an ITN	73.5		76.3		
Social Support: Mean	3.0		3.1		***
MOTIVATION					
Attitudes: Mean	3.7		3.8		***
Beliefs: Mean	3.4		3.6		**
Intentions: Mean	3.6		3.7		***
Outcome Expectations: Mean	3.5		3.7		***
Subjective Norms: Mean	3.2		3.4		***
Severity: Mean	3.5		3.4		***
Susceptibility: Mean	3.2		3.3		***
Percentage who report that pregnant women are at high risk of getting malaria	26.6		62.8		***

Percentage who report that children under 5 are at high risk of getting malaria	68.0		64.1		**
EXPOSURE TO SFH INTERVENTIONS					
Exposure to Mama Safenite					
Seen or heard information about Mama Safenite	17.8		18.9		
Intensity (Number of channels from which Mama Safenite information has been received)					
Radio	11.7		10.8		
Television	8.8		11.0		
Posters	6.0		7.1		
Newspaper	2.2		1.4		
Drama groups	2.4		1.9		

The opportunity, ability and motivation behavioural determinants presented above are drawn from the PSI behaviour change framework. *Opportunity* refers to institutional or structural factors that influence an individual's chance to perform a promoted behaviour. Opportunity can be changed by the intervention but is outside the control of the individual. *Ability* is an individual's skills or proficiencies needed to perform a promoted behaviour. *Motivation* is a goal-directed desire. Factors that drive motivation are within the individual and cannot be seen. More detailed definitions of behavioural determinants are included in Annex 4.

The TRaC questionnaire groups opportunity, ability and motivation items into the factors presented below. Scaled responses are given whereby 1=strongly disagree, 2=disagree, 3=agree and 4=strongly agree. Where the statement is a negative one in relation to the desired behaviour (eg 'using mosquito nets can cause health problems or side effects) responses are reverse coded so that 4 becomes strongly disagree with the negative statement. Using a separate index (based on the number of correct items), knowledge was captured separately with a maximum score of 9. Exploratory factor analysis using varimax rotation is used to identify the number of different dimensions or subscales within each group of items. Uni-dimensional scales containing a minimum of 3 items are then created. The Cronbach's alpha test of internal reliability within each uni-dimensional scales is then performed. Scales with an alpha value < 0.65 are not included, alpha >0.65 is considered minimally acceptable, and > 0.70 acceptable. Composite variables are then created for the multi-item scale by computing the mean response across all items and cases. Where multi-item scales could not be created, individual questionnaire items for the behavioural determinant in question are used. Mean scores for both multi-item scales and individual items in the tables below are a score out of 4, where 1 is the least desirable response and 4 the most desirable.

Monitoring Analysis: Behavioural Determinants of ITN use, Zambia, September/October 2005 & August/September 2007

The monitoring analysis shows that the percentage of women who reported sleeping under an ITN the night before the survey significantly increased from 34% in 2005 to 41% in 2007. The percentage of rural women sleeping under an ITN the night before the survey also increased significantly from 29% in 2005 to 53% in 2007. The study further found that there was a significant increase in the percentage of pregnant women reported sleeping under an ITN throughout the year (29% in 2005 to 40% in 2007). Parents who report sleeping under an ITN throughout the year also significantly increased (25% in 2005 to 33% in 2007). Net ownership has significantly increased. The percentage of rural households owning at least one ITN increased from 56% in 2005 to 72% in 2007. Among these, 30% reported that they owned more than one ITN in 2007 as compared to 23% in 2005. Knowledge of ITN as the most effective personal method to prevent malaria significantly increased from 44% to 56% during the same time period. However, the percentage of respondents who believe that they can protect themselves from malaria by using an ITN has remained at 76% in 2007 compared to 74% in 2005. Knowledge that pregnant women are at high risk of getting malaria significantly increased (63% in 2007 as compared to 27% in 2005).

Opportunity, ability and motivation determinants of contraceptive use

Four scaled responses are given where 1=strongly disagree, 2=disagree, 3=agree and 4=strongly agree. Generally, opportunity, ability and motivation responses are very positive, with mean scores between 3 and 4 on: availability, social norms concerning ITN use, knowledge, women's self-efficacy in using ITN, social support, attitudes, beliefs, outcome expectations, subjective norms, intentions, and severity.

Exposure to SFH activities

The percentage of respondents who reported that they knew where they could buy an ITN was high. Exposure in ITN promotion messages, however, marginally increased from 18% in 2005 to 19% in 2007. This is mainly due to the fact that 2006 and 2007 communications campaigns did not run with similar intensity as compared with 2005. The most commonly cited sources for ITN messages were through radio (12% in 2005 versus 11% in 2007), followed by television (9% in 2005 versus 11% in 2007) and posters (6% in 2005 versus 7% in 2007).

Segmentation Table

The segmentation analysis presented below uses logistic regression to identify determinants of the desired behaviour. The dependent variable is the behavioural indicator used in program monitoring and evaluation. A person who displays the desired behaviour is referred to as a ‘behavior’ and those who do not are referred to as ‘non-behavers’. Thus, the purpose of the logistic regression analysis is to identify the determinants that are significantly different across the behavior and non-behavior segments, in order to prioritize the behavioural determinants that should be addressed by ITN interventions. The approach is based on the premise that if, for example, women who are confident in their ability to use ITN are significantly more likely to use them, then increasing ITN use self-efficacy among those not using ITN will have the effect of turning non-behavers into behaviors.

Opportunity, ability and motivation, multi-item scales, mean scores and significance are explained in the Monitoring section above. The odds ratio (OR) is the probability of an event happening divided by probability of the event not happening and is presented in the segmentation analysis as a predictor of behaviour change resulting from a positive change in the independent variable. Alternatively put, the odds ratio tells us the change in odds of the uptake of promoted behaviour when one of the behavioural determinants is changed.

Table 2: Second Round Data on Opportunity, Ability, and Motivation Factors and Population Characteristics of ITN Use among Women aged 15-49 in Zambia

Risk Definition: Women aged 15-49 years

Behavior: Slept under an ITN last night

	Slept under an ITN last night (N=867)	Did not sleep under an ITN last night (N=382)	Sig. level	ODDS RATIO
Opportunity				
Availability	2.7	2.6	**	1.254
Brand Attributes	3.0	2.9		
Social Norms	3.3	3.1		
Ability				
Knowledge	10.4	10.1	**	1.078
Self Efficacy	3.6	3.6		
Social Support	3.2	3.1		
Motivation				
Attitudes	3.8	3.6		
Beliefs	1.7	1.6	**	1.184
Intentions	3.6	3.5		
Outcome Expectations	3.6	3.4	***	1.567
Subjective Norms	3.3	3.3		
Severity	3.4	3.3		
Perceived Susceptibility	3.4	3.2		

Population Characteristics				
Age				
15 – 24	34.1	27.7		
25 - 29	26.5	26.2		
30 - 34	18.6	21.7		
35 – 49	20.8	24.3		
Educational level				
Junior Primary or less	22.5	18.1		
Senior Primary	32.2	34.8		
Junior Secondary	21.1	21.2		
Secondary +	24.2	25.9		
SES				
Low	27.1	25.4		
Medium	34.9	32.7		
High	37.9	41.9		
N	867	382		

Significance ***P< 0.01; ** P< 0.05

Table 3: Second Round Data on Opportunity, Ability, and Motivation Factors and Population Characteristics of ITN Use among Pregnant Women in Zambia

Risk Definition: Pregnant Women

Behavior: Slept under an ITN last night

	Slept under an ITN last night (N=141)	Did not sleep under an ITN last night (N=123)	Sig. level	ODDS RATIO
Opportunity				
Availability	2.7	2.5	**	1.773
Brand Appeal	2.9	2.7		
Social Norms	3.4	3.2		
Ability				
Knowledge	10.6	10.4	***	1.792
Self Efficacy	3.5	3.4		
Social Support	3.3	3.1		
Motivation				
Attitudes	3.8	3.7		
Beliefs	3.4	3.3	**	1.6067
Intentions	3.6	3.6		
Outcome Expectations	3.6	3.5		
Subjective Norms	3.4	3.3		
Locus of control	3.1	2.9		
Perceived Severity	3.4	3.2	**	1.622
Perceived Susceptibility	3.3	3.2		

Population Characteristics				
Age				
15 – 24	38.3	27.9		
25 - 29	34.8	34.9		
30 - 34	17.0	27.9		
35 –49	9.9	9.3		
Educational level				
Junior Primary or less	32.6	23.3		
Senior Primary	27.0	46.5		
Junior Secondary	21.3	18.6		
Secondary +	19.1	11.6		
SES				
Low	10.0	4.7	1.00	
Medium	68.1	65.1		
High	31.9	30.2	**	1.627
N	141	123		

Significance ***P< 0.01; ** P< 0.05

Segmentation Analysis: Opportunity, Ability, and Motivation Factors and Population Characteristics of ITN Use, Zambia 2007

In the segmentation table, the group at risk is defined as women of reproductive age. In table 2 comparing those sleeping under an ITN with non-users, four indicators were found to be significant determinants of sleeping under an ITN: availability, knowledge, beliefs and outcome expectations. The analysis reveals that those sleeping under an ITN had a mean score value of 2.7 on availability compared to 2.5 of those who did not sleep under an ITN with an odd ratio of 1.254. The odd ratio indicates interventions focusing on improving availability are more likely to increase sleeping under an ITN.

Knowledge was also a significant determinant; those sleeping under an ITN scored 10.4 on the knowledge scale (on a scale of 0 to 12), while those did not sleep under an ITN 10.1. This finding suggests that providing women with accurate information about the use of ITN could lead to a significant increase in ITN use. If the average knowledge among the target group were to increase by one unit, the odds of those sleeping under an ITN will go up 1.1 times. The mean score for beliefs was 3.2 for those who sleep under an ITN compared to 3.1 for those who did not sleep under an ITN with an odd ratio of 1.184. The odd ratio revealed that if the mean value of positive beliefs was increased by one unit, the chances of sleeping under an ITN would increase by 1.184. The mean score of value for outcome expectation was 3.6 for those who slept under an ITN the night before the survey compared to 3.4 of those who did not sleep under an ITN with an odd ratio of 1.567. The odd ratio indicated that if the mean value of knowledge was increased by one unit, the chances of sleeping under an ITN would increase by 1.567. It seems targeting ITN communications to improve availability, knowledge, positive beliefs, and outcome expectation will lead to an increase in the proportion of those who sleep under an ITN.

Segmentation Table 3 shows determinants of sleeping under ITN against non-users among pregnant women. Four factors were identified as drivers of sleeping under an ITN. These were availability, knowledge, beliefs and perceived severity. Pregnant women with higher levels of knowledge about ITN were 1.7 times more likely to sleep under an ITN. This was also the case with those with perceived availability (1.8 times), positive beliefs (1.6 times) and perceived severity (1.6 times). It is assumed that targeting ITNs communications at improving the above mentioned drivers will lead to an increase in the proportion of respondents sleeping under ITN. This data suggests that future programs should continue to target the aforementioned OAM determinants as key indicators of sleeping under ITNs.

Evaluation Tables and Analysis: Effect of SFH Health Communications on ITN Use among Women in Zambia, 2007

The evaluation tables illustrate the correlation between the desired behaviour and exposure to SFH program activities. It uses data from surveys conducted in 2005 and 2007. Under the column entitled “Ref”, indicator levels are taken from the September 2005 survey round and are equivalent to the levels in the monitoring table. The results of this table inform programme managers as to whether there has been any positive behaviour change as a result of exposure to SFH’s health communication efforts. The questionnaire assessed the intensity of respondent’s exposure to SFH health communication messages through multiple channels including television, radio, billboards and brochures. To calculate the index, each channel was counted as one form of exposure. If a person was exposed to none of the channels, he/she was categorized as “not exposed”. One channel of exposure was categorized as “low exposure”, 2 channels of exposure were classified as “medium exposure”, and 3 or more were considered as “high exposure”.

Table 4: Correlation between ITN use and exposure to SFH’s health communications among women in, Zambia, 2007.

Behaviour/Use	Reference ¹ (2005) N=1725	Exposure to ITN message ²				Sig. Level
		None N=1274	Low N=115	Medium N=168	High N=113	
% of women aged 15-49 slept under an ITN the night before the survey	35.6 ^a	52.3 ^b	45.3 ^b	44.8 ^b	65.3 ^c	***
% of respondents who report that pregnant women in their household sleeping under an ITN throughout the year	48.7 ^a	67.8 ^b	63.6 ^b	88.9 ^c	66.6 ^c	**
% of rural women aged 15-49 slept under an ITN the night before the survey	35.2 ^a	53.2 ^b	51.4 ^b	66.7 ^c	64.3 ^c	***
% of respondents who report that parents sleeping under an ITN throughout the year	27.4 ^a	32.2 ^b	31.6 ^b	30.6 ^b	50.0 ^c	***
% of women who report that children under five are more at high risk of getting malaria	68.0 ^a	64.8 ^a	63.0 ^b	66.1 ^b	68.0 ^b	—
% of women who report that ITN as the most effective personal method to prevent malaria	44.1 ^a	54.4 ^b	61.2 ^c	60.4 ^c	65.1 ^c	***

¹ A note on reading superscripts in the exposure table: When two columns share the same superscript then it means that the difference between those two figures was not found to be significant at 95% confidence interval.

² Exposure to family planning advertisement was defined as hearing or seeing messages related to family planning. Intensity of exposure (None, Low and High) was graded based on the number of different channels through which a respondent was exposed.

Table 5: PSI's Attribution of impact on Preventive Behaviors

Behaviour/Use	Monitoring Table	Evaluation Table	Conclusion about PSI's impact
% of women aged 15-49 slept under an ITN the night before the survey	Positive	Positive	+ Impact
% of rural women aged 15-49 slept under an ITN the night before the survey	Positive	Non-significant	No impact
% of respondents who report that pregnant women in their household sleeping under an ITN throughout the year	Positive	Positive	+ Impact
% of respondents who report that parents sleeping under an ITN throughout the year	Positive	Positive	+ Impact
% of women who report that children under five are more at high risk of getting malaria	Non-significant	Non-significant	No impact
% of women report that ITN as the most effective personal method to prevent malaria	Positive	Positive	+ Impact

The results indicate that exposure to SFH communications is significantly correlated with those sleeping under an ITN. Approximately, 65% of respondents with high exposure reported having slept under an ITN the night before the survey compared to 52% of those with no exposure. About 64% of rural women with high exposure reported having slept under an ITN the night before the survey compared to about 53% of those with no exposure. Pregnant women with high exposure to media campaign were more likely to report sleeping under an ITN throughout the year: 79% of those with media exposure reported having slept under an ITN throughout the year compared to 68% of those with no exposure. About 50% of respondents reported that parents who lived in their household slept under an ITN throughout the year compared to 32% of those with no exposure. Respondents with high exposure were more likely to report that ITN were the most effective personal method to preventing malaria: 65% of those with high media exposure reported that sleeping under an ITN were the most effective personal method to preventing malaria compared to 61% of those with low exposure and 54% of those with no exposure.

Program Recommendations

The results from SFH's 2007 Maternal and Child Health TRaC Survey focusing on ITN use indicate positive trends in health behaviour, knowledge, and awareness since the 2005 survey. They also provide indications of the effectiveness of certain health interventions and campaigns offering direction for those seeking to improve current programs and design follow-on activities.

Availability of ITN was found to be significant determinant of its use. Programmes and activities should still focus on increasing the availability of ITNs in order to increase net ownership and use. In addition to making nets more available, ensure that BCC messages should enhance perceived availability by informing consumers where and how they can obtain the product. Knowledge about ITNs is particularly lower among non-users. Interventions should aim to increase specific knowledge of ITNs as a method to prevent malaria. Positive outcome expectations are a significant driver of ITN use. The programme should promote the benefits of ITN in order to improve perceived outcome expectation. The target group should believe that ITN use prevents malaria by providing protection from mosquito bites. Prevention messages should concentrate on improving awareness of ITN and affirming that ITN are the best effective method of prevent malaria. Additionally, improved attention need to be paid on the risk perception. For programmatic messaging, it may be worthwhile to tap into this perception that malaria is a problem in the community and pregnant women are more at risk of getting malaria as a key reason for the importance of pregnant women should sleep under an ITNs throughout the year. In order to increase the proportion of people sleeping under an ITN, new ITNs communications development campaign should incorporate these determinants as part of the demand creation strategies.

The evaluation analysis indicated that increased exposure to the intervention message through different media channels yielded significant increased desired behavior in terms of an ITN use. Thus, it is recommended that market interventions should spend more in improving the quality of messages used to persuade behaviour change. Educational messages should emphasize on the necessity of using ITN consistently throughout the year.

Appendix 1: Population Characteristics

POPULATION CHARACTERISTICS	% or mean
<i>Currently married</i>	77.8
<i>Less than secondary school education</i>	58.0
<i>Average age of respondents(in yrs)</i>	28.9
<i>Percent residing in rural areas</i>	52.7
<i>Ever had a child</i>	93.4
<i>Mean number of children (mean)</i>	3.4
MEDIA ACCESS	
<i>Ever listen to the radio</i>	63.2
<i>Ever watch television</i>	30.1
<i>Ever read newspapers</i>	14.3

Annex 2: Methodology

Sample Characteristics: The study was based on reports from randomly selected women (15-49 age groups) from urban and rural areas in all nine provinces of Zambia. This first round of this TRaC study was conducted in Zambia during September of 2005. The study is based on a representative sample of 1725 women aged 15-49 living in Zambia. The second round TRaC study was conducted in Zambia during August 2007 and is based on a representative sample of 1670 women aged 15-49. Both rounds followed the same sampling procedure.

The sample was drawn by the Central Statistical Office (Batista, 2007). A three stage stratified cluster sampling procedure was used to select the required households from which one woman aged 15-49 was interviewed. In the first stage, 66 Standard Enumeration Areas (SEAs) were randomly selected for the study across the country. A sampling interval of the SEAs was calculated by dividing the total number of households in each strata by the number of SEAs to be selected in each cluster. The selection of the sample in each cluster employed Probability Proportional to Size (PPS) sampling scheme, where the measure of size was taken to be the household count in each SEA. A random number was generated to select the first SEA in each cluster. To select the next SEA in a cluster, the random number generated was added to the sampling interval and this process was repeated until all the required number of SEAs in each cluster was selected.

In the final stage of sampling, households were selected using systematic selection method by applying a fixed interval. In an event where there were more than one eligible respondent at household, the woman who was most responsible for daily chores and care of children was interviewed

The fieldworkers were provided with maps to conduct the selection of households to be visited within each SEA. The maps were used to establish the boundaries of the selected SEA. Apart from the maps, fieldworkers had household count forms for each SEA. These were used to establish the sampling interval in each SEA. Thus the number of households in the SEA was divided by the number of households required in order to get the sampling interval.

Data Collection Procedure The first round of data collection was carried out between August and September 2005 and the second round was conducted between August and October in 2007 by a team of 16 interviewers and 4 supervisors. All supervisors and the interviewers attended a

three-day intensive training programme. The course covered the theory and practice of questionnaire design, sources of bias, interviewing techniques, general information about family planning and a lot of mock interviews with the survey questionnaire. The enumerators were divided into 4 teams, and each team was supervised by one supervisor. Questionnaires were manually checked while fieldwork was being conducted. A maximum of three visits (an initial visit plus two call-backs for households that were closed at the first or second visit) were made to each selected household. Only after the three attempts were households substituted and the reason for substitution was recorded on the cover page of the questionnaire.

Survey Instrument(s) The questionnaire was administered by trained interviewers in all nine provinces and took approximately 45 minutes to complete. The questionnaire included population characteristic, behaviour, opportunity, ability, motivation and media consumption items and exposure to social marketing interventions.

The questionnaire used for this survey was designed after a review of the literature and other PSI survey questionnaires used to study attitudes and behaviours related to contraceptive use. Behaviour indicators included log frame indicators and other stakeholder and donor indicators which are important in family planning programming. Questions measuring opinions were presented on a four-point scale: 1) strongly disagree, 2) disagree, 3) agree and 4) strongly agree. Population characteristics, media habits, exposure to other family planning campaigns were included in the adopted questionnaire.

The questionnaire was piloted with 120 women in order to validate the scales used to measure the determinants of behaviour. After completing the reliability and validation check, some of the scale items questions which were not reliable were dropped. The pilot also served as a measure of how the inbuilt consistent checks were working. Fieldworker's competency to handle the question was again assessed during the pilot survey.

The questionnaire was developed in English and translated first into two most widely spoken languages (Bemba and Nyanja). Thereafter, the questionnaires were translated into other languages. Comments and suggestions from experienced supervisors and fieldworkers were integrated into the final version of the questionnaire for greater clarity of questions.

Analytic Technique Data were entered using EPINFO software. Statistical analysis was performed with SPSS. Data were analyzed using PSI's Dashboard Analysis Techniques. The following analyses were conducted:

- Simple frequencies and means were run on descriptive data for monitoring purposes
- Reliability testing was conducted for scale items. Scales were considered reliable if they achieved a Chronbach's alpha of .70 or higher. Individual items from unreliable scales were tested independently in subsequent analysis as possible predictors of oral contraceptive use.
- Scaled constructs, individual OAM variables, population characteristics, and exposure indicators were tested for bivariate correlations with the outcome variable oral contraceptive use. Predictors from each bubble category (opportunity, ability, and motivation) that were significantly correlated with the outcome were selected for inclusion in the logistic regression model. All population characteristics and exposure indicators that were significantly correlated with the outcome variable were also included in the logistic regression model.
- The monitoring table was produced based on amerged data set form the baseline survey of 2005 and the follow-up survey of 2007.
- At the multivariate level, logistic regression analysis was used to measure the net effect of independent variables on the likelihood of oral contraceptive use. To simplify interpretation, the results of the logistic regression analyses were presented as odds ratios. For example, odds ratios greater than one imply a higher likelihood of behaviors than the reference category. Odds ratios smaller than one imply a lower likelihood of behaviors than the reference category. The evaluation table categorizes exposure in terms of low, medium and high exposure based on exposed to number of channels.

Appendix 3: Reliability Analysis

Scales Items	No. of items	Alpha
300 OPPORTUNITY: Availability	4	0.8513
Mosquito nets are easily available here.		
Health centers nearby here always have mosquito nets for sale.		
Mosquito nets are available during all seasons.		
It is easy to get mosquito nets at the nearby health clinics.		
OPPORTUNITY: Brand Attributes	4	0.8604
Some mosquito nets are difficult to hang.		
It is difficult to find a place to hang a mosquito net.		
Setting up a mosquito net so that people can sleep under it can be difficult.		
Some mosquito nets affect breathing.		
OPPORTUNITY: Social Norms	3	0.7870
My friends typically use mosquito nets to prevent malaria.		
In my community many people are using mosquito nets to prevent malaria.		
It is normal to use mosquito nets in our community.		
ABILITY: Self-Efficacy	4	0.8580
I can correctly set up a mosquito net for my family to use.		
I can persuade my family to sleep under a mosquito net.		
I can use a mosquito net even if other people in my household do not agree to it.		
I can sleep under a mosquito net.		
ABILITY: SOCIAL SUPPORT	5	0.8549
My friends encourage me to sleep under a mosquito net.		
My family members encourage me to use mosquito nets.		
My partner/friends support the use of mosquito net.		
My partner always encourages me to sleep under a mosquito net.		
I discuss the use of mosquito nets with friends		
MOTIVATION: Attitudes	4	0.7460
Using a mosquito net is reliable.		
Using a mosquito net is beneficial.		
Using a mosquito net is safe.		
Using a mosquito net is effective.		
MOTIVATION: Beliefs	3	0.7507

Using a mosquito net can cause health problems or side effects.		
Sleeping under a mosquito net always causes people to cough/sneezing while sleeping.		
Sleeping under a mosquito net can make you feel constrained.		

ABILITY: Knowledge³		
Some contraceptives are to be taken by mouth everyday.		
If you stop using a contraceptive method, you can get pregnant again.		
Women can have an injection by a doctor or nurse which stops them from becoming pregnant for several months.		
Women can take a pill which stops them from becoming pregnant for several months.		
A man or a woman can put a rubber sheath on their penis or vagina during sexual intercourse to prevent pregnancy.		
A woman or a man can have an operation to avoid having any more children.		
Couples can avoid pregnancy by not having sexual intercourse on the days of the month when the woman is more likely to become pregnant.		
There is a need to consult a health worker before taking a pill.		
Prolonged breastfeeding can delay the chances of a woman becoming pregnant.		
There are different methods of contraceptives which couples can use to space the birth of their children.		
SafePlan is a family planning pill.		
3 to 5 years between births reduces the risk of death to a mother and child.		

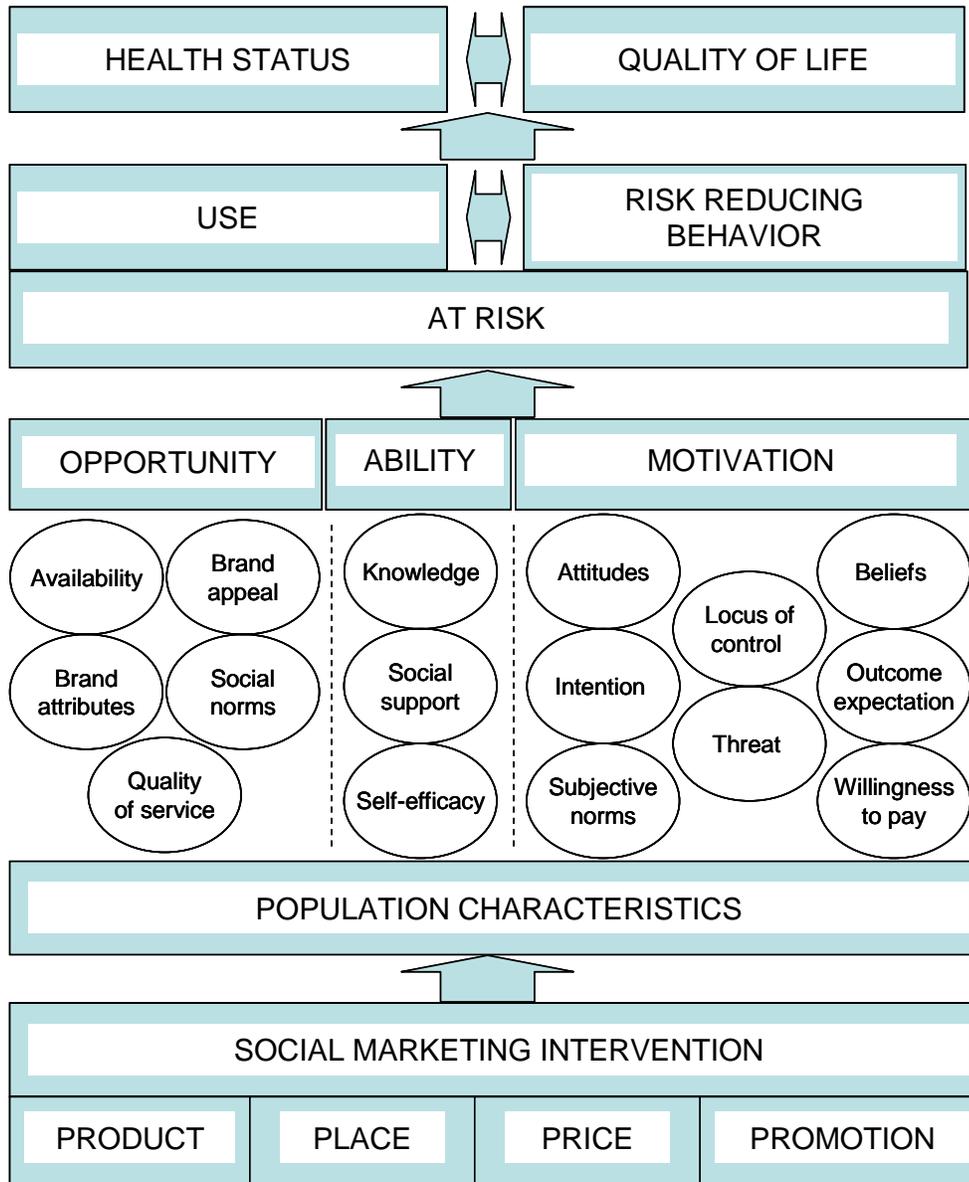
MOTIVATION: Intentions	3	0.6654
I intend to use a mosquito net.		
I intend to sleep under a mosquito net all time of the year.		
I will make sure a mosquito net is used in our family.		
MOTIVATION: Locus of Control for Malaria Prevention	3	0.7853
People can get malaria because of cold or changing weather and it cannot be avoided.		

³ Knowledge items were not subjected to reliability analysis, hence there is no Cronbach's Alpha.

I could get malaria even if I do my best to prevent it.		
People like me can't really control whether we get malaria.		
MOTIVATION: Outcome Expectations For Mosquito net use	4	0.8213
I think sleeping under a mosquito net offers excellent protection against malaria.		
Sleeping under a mosquito net saves lives.		
Mosquito nets provide full protection from mosquito bites when people sleep under them.		
If I sleep under a mosquito net I am less likely to get malaria.		
MOTIVATION: Subjective Norms	4	0.7547
My partner/family member would approve of me using a mosquito net.		
My friends would approve of me using a mosquito net.		
My parents believe that I should always use a mosquito net to protect myself from malaria.		
My friends want me to use mosquito nets.		
MOTIVATION: Perceived Severity	3	0.7729
Malaria can hinder children's growth.		
Malaria can cause premature or still births.		
Malaria can cause low birth weight.		
MOTIVATION: Perceived Susceptibility	5	0.7900
I believe that chances are high that I could get malaria.		
I believe that my children can be exposed to malaria if I do not use a mosquito net.		
I am likely to deliver premature or still birth if I get malaria during pregnancy.		
I am likely to give birth to an underweight baby if I get malaria.		
I am afraid of abortion or miscarriage due to malaria.		

All are based on a 4-point scale, where 4 = Strongly Agree, 3 = Agree Somewhat, 2 = Disagree Somewhat, 1 = Strongly Disagree

Annex 4: Performance Framework for Social Marketing



PSI Behaviour Change Framework: Definitions of Behavioural Determinants

OPPORTUNITY	Institutional or structural factors that affect the chance the individual has to perform the promoted behaviour. Factors that can be changed by PSI but outside the control of the individual.
Availability	The extent to which a promoted product or service is found with a pre-defined area.
Brand Appeal	The importance of brand (name, symbol, design, slogan, etc)
Brand Attraction	The extent to which a certain brand (name, symbol, slogan, etc) stands out from its competitors.
Brand Attributes	The extent to which the physical components of a certain brand are practical to use.
Social Norms	The extent to which a promoted behaviour is typically practised in the community.
ABILITY	The skills of the individual or the proficiency needed to perform a promoted behaviour. Factors that can be changed by PSI, that are within the control of the individual and that can be demonstrated by an action.
Knowledge	The level of factual information that an individual has about the subject.
Self Efficacy	The conviction an individual has about his ability to perform a promoted behaviour effectively or successfully.
Social Support	The level of emotional, practical or informational support that the individual receives.
MOTIVATION	The desire or wish of an individual to perform a promoted behaviour. Factors that can be changed by PSI and that are within the control of the individual but that cannot be demonstrated.
Attitudes	The individual's evaluation of a promoted behaviour or product.
Beliefs	The perceptions of a promoted behaviour, that may or may not be true, but specifically false perceptions if they exist.
Intention	The extent to which the individual is ready or willing to perform the promoted behaviour.
Subjective Norms	The pressures that the individual perceives to conform to what he believes other in the social group believe about a promoted behaviour.
Locus of Control	Whether control in the individual's life is situated within him or externally.
Threat	The perceived severity of the problem (including physical, psychological or economic harm).
Outcome Expectation	The extent to which the individual believes that a promoted behaviour, product or brand will deliver its promise.
Willingness to Pay	How much the individual is prepared to pay for different promoted products or services.

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