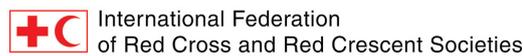


RBM Partnership
To End Malaria



**The Art of Asking Questions:
Priority Research Areas and Approaches
for Malaria Social and Behavior Change
Programs**

February 2019



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Acronyms

BE	Behavioral economics
ITN	Insecticide-treated net
KAP	Knowledge, attitude, and practice
M&E	Monitoring and evaluation
RBM	Roll Back Malaria
SBC	Social and behavior change
SBCC	Social and Behavior Change Communication
SEM	Structural equation modeling
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

The Art of Asking Questions: Priority Research Areas and Approaches for Malaria Social and Behavior Change Programs

In the role of research in advancing malaria social and behavior change (SBC) programming The World Health Organization's Global Malaria Technical Strategy 2016-2030 called for harnessing innovation and expanding research as a key pillar [1]. Just as resources are being funneled into research for better insecticides, vector control tools, drugs, tests, and operational delivery mechanisms, so must research be conducted on how to make SBC programs more effective. SBC programs are essential for ensuring that populations at risk for malaria continue to seek out and use malaria products and services. According to the Strategic Framework for Malaria Social and Behavior Change Communication 2018-2030, SBC programs can be high-impact, strategic investments when they are based on evidence around the factors affecting behaviors and data-driven selection of appropriate channels and approaches [2].

SBC research will be key as countries move closer to elimination and the importance of maintaining behaviors or adapting to low-transmission interventions increases. SBC research should factor in the substantial evolution of malaria programs over the past 20 years. Since 2000, nine countries have eliminated malaria and many others have reduced transmission to pre-elimination levels. Much can be learned from these countries to inform programs in high-transmission areas. Moreover, new challenges arise as transmission decreases and malaria elimination becomes a possibility. In such settings, it may be difficult to maintain insecticide-treated net (ITN) use, demand for diagnostic testing, and prompt treatment-seeking if perceived risk declines, and/or when asymptomatic individuals are being targeted [3]. In addition, research is needed to support the optimal use of new interventions for residual transmission to combat insecticide or drug resistance, or increase acceptance for seasonal malaria chemoprevention, active and reactive case detection, mass drug administration, and vaccine trials.

At the same time, there is a growing interest in applying approaches such as human centered design, behavioral economics to malaria SBC programs, but little is yet known of their impact and scalability. The expansion of digital technologies have created intense competition for audiences' attention, driving questions about the most cost-effective ways to use new media. There is a dearth of information on the determinants of provider behaviors for malaria, and on the gaps between access to resources for malaria-related behaviors and actual adoption and maintenance of those behaviors.

The Roll Back Malaria Social and Behavior Change Communication (SBCC) Working Group identified priority research areas and approaches that will need to be explored and utilized as malaria interventions scale up and as countries move closer to elimination.

They are:

1. Understanding factors that impede or encourage malaria-related behaviors
2. Documentation of implementation quality
3. Using appropriate research approaches and tools

Specific research questions should be tailored to the needs of each country or program. This document can be shared with the Operations Research, monitoring and evaluation (M&E), and SBCC technical working groups to generate ideas for each country or each program's research agenda.

Priority area 1. Factors that impede or encourage the recommended behavior

Understanding factors that impede or encourage the recommended behaviors is key to formulating effective messages and approaches. These factors may operate differently in different contexts, such as high versus low transmission or dry versus rainy season. The intersection between the behavior of persons at risk and the behavior of the vectors they are exposed to remains an area to be explored, particularly as vector composition shifts in areas of intense malaria

transmission. Some work has started in examining ideational factors in some contexts, but the contribution of behavioral economics concepts to malaria behaviors have yet to be studied (see box below). Greater consistency in measuring behavioral determinants to enhance comparisons across contexts is also needed.

Developing research questions under priority area 1 requires clarity in several things: the behavior of interest, the population (or audience) that should be practicing the behavior, the context, and the behavioral factors. Figure 1 shows this process, including an example, while Table 1 presents a menu of illustrative options under each component.

A brief overview of behavioral factors

There are many types of behavioral factors. This document groups them in two main categories; but, in practice, these categories are fluid. The behavioral economics/behavioral sciences field, for example, sometimes uses concepts like social norms in the interventions they design.

Ideation factors refer to the different types of beliefs, attitudes, perceptions, and values that affect people's behavior. These can include—but are not limited to—risk perceptions, social beliefs or interactions (what the individual thinks others are actually doing [social norms] or what others think the individual should do); how confident a person feels in performing the behavior (self-efficacy); and many others.[4]

Behavioral economics (BE)—sometimes referred to as behavioral science—draws on insights from psychology, microeconomics, and other social sciences to understand human behavior. According to BE, humans have limited cognitive processing capacity, which gets used up as problems and choices become more complex and as each day progresses. Therefore, much of people's behavior is influenced by subconscious biases, context, and mental “shortcuts” that benefit them immediately, rather than by rational deliberation of long-term gains. Health programs need to anticipate these cognitive shortcuts and create environments, processes, and products that makes decision making for optimal health easier.[5] Examples of behavioral economics concepts include framing (the way options are presented; people usually choose the option that is easiest or first); choice overload (giving people too many options, which makes decision making more difficult); and availability heuristic (people's beliefs are based on what most quickly comes to mind; one example is believing that some unhealthy beliefs or practices are widespread because there are rumors/discussions about it).[6]

Figure 1. Process for generating research questions to explore factors that influence malaria behaviors



While Figure 1 only shows one behavioral factor, multiple factors can be explored at the same time. However, it would be challenging to examine all factors, because it would make the research study too cumbersome and too expensive. The choice should be the most likely factors based on a literature review, plausible theories about cause and effect, knowledge of the culture, and burden (assessing too many factors may make data collection too expensive/cumbersome). In addition to the ideational factors shown below, concepts from the behavioral economics, could also be explored.

A systematic review of the malaria evidence found a gap in the literature on SBC impact on malaria in pregnancy.[7] Of the 80 papers that assessed the impact of SBC exposure on malaria behaviors, only 10 papers included malaria in pregnancy. (Note: The review covered ITN use, case management, indoor residual spraying and malaria in pregnancy, so evidence on SBC impact on other behaviors listed in Table 1—such as seasonal malaria chemoprophylaxis—were not summarized.) An expert consultation on malaria SBC also identified the need to better understand providers as individuals and the factors that affect their adherence to malaria guidelines; while there is some impact on the influence of training and multi-channel activities, a better understanding of provider motivations and tweaks that can be made to the immediate service delivery context may also be worth exploring.[8]

Table 1. Menu of options for exploring factors that influence malaria behaviors

1. Behaviors	Beneficiaries (high and moderate transmission)		
	Prevention <ul style="list-style-type: none"> • Use of nets (once acquired) • Acquisition of nets • Net care and repair • Acceptance of IRS spray teams • Not repainting or replastering walls • Adherence to/ acceptance of seasonal malaria chemoprevention • ANC attendance • Taking IPTp at ANC 	Case Management <ul style="list-style-type: none"> • Treatment-seeking • Adherence to test results • Adherence to treatment 	Integration - multiple malaria or health behaviors
	Beneficiaries (low, very low, zero transmission)		
	Prevention <ul style="list-style-type: none"> • Taking prophylaxis/using ITN when traveling to malaria area • Acceptance of mass screening and treatment • Acceptance reactive/active case detection • Acceptance of mass drug administration 	Case Management <ul style="list-style-type: none"> • Vaccine acceptance • Consistent use of spatial repellents/ toxic sugar baits/ personal protective measures 	Integration - multiple malaria or health behaviors
	Providers (high, moderate, low, very low, zero transmission)		
	Prevention <ul style="list-style-type: none"> • Testing fevers • Adhering to negative test result (not prescribing antimalarials) • Counseling patients • Administering ACTs 	Case Management <ul style="list-style-type: none"> • Administering IPTp • Distributing ITNs • Complete and timely reporting • Stock management 	
2. Audience	Beneficiaries <ul style="list-style-type: none"> • Caregivers • Men & women of reproductive age • Opinion leaders • Mother in-laws • Adolescents • Geographical or cultural group • Occupation (ex: migrant, miners) 	Providers <ul style="list-style-type: none"> • Public health facility providers, by cadre • Private drug shops, by cadre/training level • Community health workers 	
3. Contextual Factors	<ul style="list-style-type: none"> • Dry vs. rainy season • Travel patterns of target audience • Urban vs. rural • Type of risk group • Indoor/outdoor sleeping patterns • Nighttime leisure or work behaviors 	<ul style="list-style-type: none"> • Endo/exophagic vectors • Anthrophilic/zoophilic vectors • Night/day biting vectors • Transmission zone • Access to commodities or services • Epidemic/outbreak 	
4. Behavioral Factors*	Ideational <ul style="list-style-type: none"> • Perceived susceptibility • Perceived severity • Self-efficacy 	Cognitive <ul style="list-style-type: none"> • Gender and social norms • Attitudes 	

*Not an exhaustive list due to space limitations. See resources for more factors.

Acronyms: IPTp - intermittent preventive treatment in pregnancy; ANC - antenatal care; IRS - indoor residual spraying; ACT - artemisinin-combination therapy

Priority area 2. Improved documentation of implementation quality

According to a recent review of the malaria SBC evidence[7], campaigns that used a combination of mass media (such as radio) and community sources (such as community dialogues) increased the likelihood of behavioral adoption. Similarly, there was a dose-response relationship between the number of sources of information and behavior change.

However, the review noted that most papers did not measure program exposure, and that SBC interventions were poorly described. This information is useful for understanding the effectiveness and costs of channels selected and other implementation choices. For example, a multi-channel program in three countries—Ecuador, Colombia, and Nicaragua—had a poor behavioral impact in Nicaragua on the administration of chloroquine because of the limited implementation of activities.[9]

To help inform programmatic decisions, as well as respond to donor

concerns over value for money, the following are recommended: documenting aspects of implementation quality, such as data sources and processes used to design programs; harmonization (the consistency of messaging across platforms); the reach, frequency, and duration of activities; the focus of messaging (whether single topic, or integrated across multiple health areas); the degree of audience interaction; and the emotional/cultural resonance of the materials and activities. Table 2 illustrates some of the different channels available and the aspects of implementation. A suggested list of items to report on in malaria SBC evaluations can be found here

Some areas for further research include—

- What are the relative contributions of various channels?
- What channels/interventions are more or less cost effective? What is the optimal channel mix for each audience in a given area?
- What determines audience channel choices? What drives audience engagement? What motivates audiences to learn more about the behavior, or to act as ambassadors?
- What is the impact and scalability of interventions arising from human-centered design and behavioral science approaches?
- For provider behaviors, how are SBC and service delivery interventions defined, and what are their additive effects?
- Which behaviors can best be tackled within the context of integration, and which behaviors benefit from a focused/vertical approach?

Table 2. Communication channels and factors involved in program implementation

Channels	Implementation Aspects
<ul style="list-style-type: none"> • Mass media (TV, radio, newspaper) • Phone calls and short message service • Social media (Facebook, Whatsapp, etc.) • Interpersonal communication (opinion/traditional/religious leaders, group discussions, home visits, counseling sessions, civic organizations, events) • Print and outdoor media • Internet 	<ul style="list-style-type: none"> • Frequency • Duration • Reach • Harmonization • Branding • Integration • Degree of interactivity/engagement • Degree of user participation in design • User experience • Emotional connection

Priority area 3. Use of appropriate research approaches and tools

Randomized control trials are the gold standard for research design. However, these are hard to use for evaluating SBC interventions because it is usually impossible to randomly assign an individual to be exposed to SBC.

However, there are existing research approaches that are useful for clearly demonstrating the impact of SBC. This document calls for more widespread use of these methods. These approaches can be used singly or in combination based on the data available and the objectives of the study. Details and examples can be found in the citations following each item below.

- Approaches to establish temporality - This involves the use of pre -and-post studies, repeat cross-sectional or longitudinal (cohort) studies. These research designs allow SBC evaluations to show that exposure preceded changes in behavior; account for pre-intervention trends; and changes in exposure, attitudes/beliefs, and behavior over time, including seasonal variation (which could be particularly useful in malaria); and how long effects can be observed after the SBC program. Swaziland, for example, does annual knowledge, attitude, and practice (KAP) surveys to monitor and inform its SBC programs. [3] This would ideally be complemented with routine service delivery data and could be made economically feasible using multiple short surveys—sometimes called “monitoring surveys”. [11, 17]
- Approaches to demonstrate a dose-response relationship - Compares levels of exposure with behavioral change; theorizes that greater levels of exposure are associated with greater behavioral changes. [7] This can be assessed by counting the number of sources recalled by respondents, or how often they recalled seeing or hearing the SBC message. Based on this, respondents are categorized as having zero, low, medium, or high rates of exposure. The attitudes or behaviors of individuals with zero exposure are then compared to people with low, medium, or high rates of exposure. [11, 16]
- Approaches that provide an explanation for how change occurred:
 - Structural equation modeling (SEM) is a data analysis approach that allows researchers to identify the links between behavior and potential determining factors. It uses a combination of factor analysis and multiple regression analyses to test these relationships while accounting for correlations between factors.
 - Mediation analysis is another analytical approach that is useful for checking for direct and indirect relationships.
- Approaches that minimize the effects of non-randomization:

- Propensity score matching is an analytical approach that allows researchers to create control groups. Propensity score matching can help reduce self-selection bias (the fact that individuals do not randomly choose to be exposed to the SBC intervention; exposure is usually based on individuals’ voluntary choice, which is influenced by a variety of factors) and endogeneity (when the researcher cannot determine whether exposure to the program preceded the outcome/behavior, or the expected outcome/behavior influenced exposure to the program). With this method, background variables are regressed to calculate individuals’ likelihood to be exposed to the intervention. The scores are then used to match similar exposed and unexposed individuals. [14, 15]

- Approaches to reduce correlations that affect causal attribution:
 - Multilevel modeling: For economic reasons, large surveys often use multi-stage cluster sampling. For example, an individual respondent is selected within a household; which in turn is nested within a village/cluster. In data sets like these, outcomes of people in the same household or cluster may be correlated. There may be unmeasured village characteristics that affect the outcomes of people from that village. Multilevel models reduce this risk by accounting for correlations in responses within clusters. [16]

Some additional measurement methods are also needed. The evidence review identified a lack of understanding on the gap between access to malaria services/commodities and actual adoption and maintenance of malaria behaviors. [7] Rarely is this gap clearly measured, and qualitative methods may be useful for identifying factors that influence behavioral adoption. The use-to-access ratio is now available for ITNs [18]; similar indicators and analyses may be needed for malaria in pregnancy and case management.

There is also a lack of understanding and precise measurements of social norms and beliefs that SBCC campaigns might have influenced. The evidence found that while SBCC campaigns focus on social norms and beliefs to promote malaria-related behaviors, very few follow up to measure whether normative change resulted from those SBCC campaigns. [7] The Malaria Behavioral Survey toolkit[19] and Malaria Indicator Reference Guide[20] have questions that could be used to measure them, but they have only been tested in a few countries. Similarly, the interaction between human behavior and residual malaria transmission is still being determined. Standard measures are needed for assessing who, where, when, and how people are at risk for contracting malaria when a net is not viable, as well as what interventions could be feasibly adopted in these situations.[21] Last, existing data collection systems, such as health management information systems, supportive supervision checklists, and health facility assessments, could be leveraged to improve the understanding of provider and client behavior. Defined indicators tailored to different data sources would be a positive step in strengthening our understanding of provider behavior change for malaria. [8]

Conclusion

As the malaria transmission dynamics have evolved during the past 20 years, so have the fields of behavioral science and communication technologies. The three areas of research priorities and approaches outlined above—(1) understanding behavioral determinants, (2) documenting implementation quality, and (3) using appropriate research methods—offer SBC programs opportunities to increase their impact.

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