

MALARIA SOCIAL AND BEHAVIOR CHANGE COMMUNICATION EVIDENCE LITERATURE REVIEW

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U.S. President's Malaria Initiative



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Acronyms

DHS	Demographic and Health Survey
CHW	Community Health Worker
HC3	Health Communication Capacity Collaborative
IRS	Indoor Residual Spraying
ITN	Insecticide-Treated Net
IPTp	Intermittent Preventive Treatment in Pregnancy
LMIC	Low- and Middle-Income Country
RCT	Randomized Control Trial
RDT	Rapid Diagnostic Test
SBCC	Social and Behavior Change Communication
SP	Sulfadoxine-Pyrimethamine
WHO	World Health Organization

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Introduction

Malaria is currently endemic in 91 countries and continues to be a cause of high morbidity and mortality, especially in children under five years of age. In 2015, there were 212 million malaria cases and 429,000 deaths in the world. The African region accounts for almost 88 percent of the global cases of malaria, and 70 percent of malaria deaths occur in children under five.¹ About 80 percent of malaria cases occur in 15 high-burden countries in Africa, and progress in the reduction of malaria incidence has been slow. Many challenges must be overcome in order to achieve the ambitious 2030 goals set by the World Health Organization (WHO) to further reduce malaria morbidity and mortality by 90 percent.² However, considerable progress has been made in the reduction of malaria mortality, with rates falling by 60 percent from 2000 to 2015.

Malaria prevention and control efforts—including those that increase the demand and use of insecticide-treated nets (ITNs), rapid diagnostic tests (RDTs), intermittent preventive treatment in pregnancy (IPTp) and indoor residual spraying (IRS)—are key to reducing malaria incidence and mortality. The provision of ITNs increased substantially after 2000 and, by 2014, about 56 percent of the population in sub-Saharan Africa had access to an ITN.³ Between 2009 and 2012 alone, 94,000 newborn lives were saved through the use of malaria in pregnancy interventions.⁴ The introduction of RDTs has also facilitated early detection and treatment of malaria, and accounted for 74 percent of diagnostic testing among suspected malaria cases in 2015.⁵ Furthermore, RDTs have made it possible to have community- and household-level interventions promoting early detection and timely treatment of malaria. However, there is still work to be done to achieve and sustain the scale of these proven interventions.

Social and Behavior Change Communication

Social and behavior change communication (SBCC) represents the science of changing and sustaining health behaviors in theoretically, culturally and contextually relevant ways. SBCC has been defined as the process of “improving health outcomes through more healthful individual and group behaviors as well as strengthening the social context, systems and processes that underpin health.”⁶ SBCC can facilitate the creation of enabling environments that support community members, fieldworkers or health providers as they seek to change or sustain health-related behaviors. Unfortunately, the 2016 World Malaria Report does not address the role of SBCC in behavior change and maintenance.

The Health Communication Capacity Collaborative (HC3) at the Johns Hopkins Center for Communication Programs (CCP) identified a gap in the literature regarding consolidated evidence

¹World Malaria Report 2016. Geneva: World Health Organization; 2016. Licence: CC BY-NC-SA 3.0 IGO.

²Global Technical Strategy for Malaria 2016-2030. World Health Organization; June 2015. ISBN: 978 92 4 156499 1. <http://www.who.int/malaria/publications/atoz/9789241564991/en/>

³World Malaria Report 2014. Geneva: World Health Organization; 2014. Licence: CC BY-NC-SA 3.0 IGO.

⁴Hill, et al. The contribution of malaria control to maternal and newborn health. Roll Back Malaria Progress and Impact Series No. 10. 2014. <http://archiverbm.rollbackmalaria.org/ProgressImpactSeries/docs/report17-en.pdf>

⁵World Malaria Report 2016. Geneva: World Health Organization; 2016. Licence: CC BY-NC-SA 3.0 IGO.

⁶Defining Social and Behavior Change Communication (SBCC) and other Essential Health Communication Terms, Technical Brief. The Manoff Group. <http://manoffgroup.com/documents/DefiningSBCC.pdf>

of the impact of SBCC interventions on malaria-related behavioral outcomes. This evidence base could provide program planners, practitioners and policy-makers with an understanding of how to strategically use SBCC to strengthen their malaria efforts. Implementing effective SBCC can improve the health of at-risk populations, such as pregnant women and children under five.

Malaria Evidence Review

This malaria SBCC evidence review is designed to help identify what is known and unknown in the literature on the impact of SBCC on malaria-related behavioral outcomes and to bring evidence-based approaches to the fore. The review is structured to address the information and evidence needs of malaria SBCC professionals. As such, SBCC activities identified by this review have been noted in three publicly-available products—a searchable, online database summarizing SBCC interventions and the results, as well as fact sheets and infographics highlighting the impact of SBCC programs on malaria prevention and treatment behaviors.

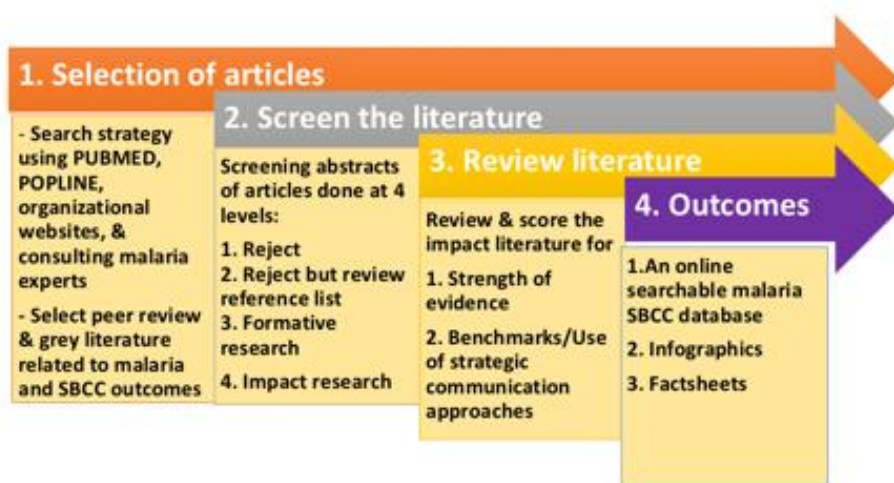
The objectives of the malaria SBCC evidence review are to:

1. Identify and assess the evidence base for the role of SBCC on the uptake of malaria prevention and treatment behaviors,
2. Create a searchable, online database featuring the significant findings of this review and
3. Synthesize the key findings of the review into fact sheets and infographics.

Methodology

The development process of the Malaria SBCC Evidence Package included four distinct phases: selection of articles, screening of articles based on set criteria, reviewing articles using the set criteria and preparing the final outputs (**Figure 1**).

Figure 1
Methodology



Quality checks performed at each stage

I. Selection of Articles

Search Strategy

The selection process included the review of several databases to identify SBCC's impact on malaria prevention and treatment behaviors. The search included peer-reviewed and gray literature. The HC3 malaria team developed the search terms (**Appendix A**) and the Roll Back Malaria SBCC Working Group's Monitoring and Evaluation Task Force reviewed them. An informationist at the Johns Hopkins University Welch Library executed the search strategy in PubMed and POPLINE databases, as well as in various organizational websites and databases (**Appendix A**). The PubMed search yielded 3,601 articles. The gray literature searches yielded 1,666 articles. These articles were then screened to narrow down to ones that were relevant to the evidence review (**Appendix B**).

II. Screen the Literature

To systematically assess the available evidence on the impact of SBCC on malaria outcomes, the research team used a multi-phased search and review process, involving abstract and full-article reviews that included scoring for research design and strategic SBCC approaches. After the literature was reviewed, the next step was to screen abstracts using a set list of inclusion-exclusion criteria (**Appendix C**).

Articles were included in the review if they: (1) described SBCC interventions, (2) were implemented in low- and middle-income countries (LMICs), (3) focused on a single intervention or included a meta-analysis/synthesis of multiple programs, (4) reported behaviors or influencing factors that impact malaria-related interventions, and (5) were in English.

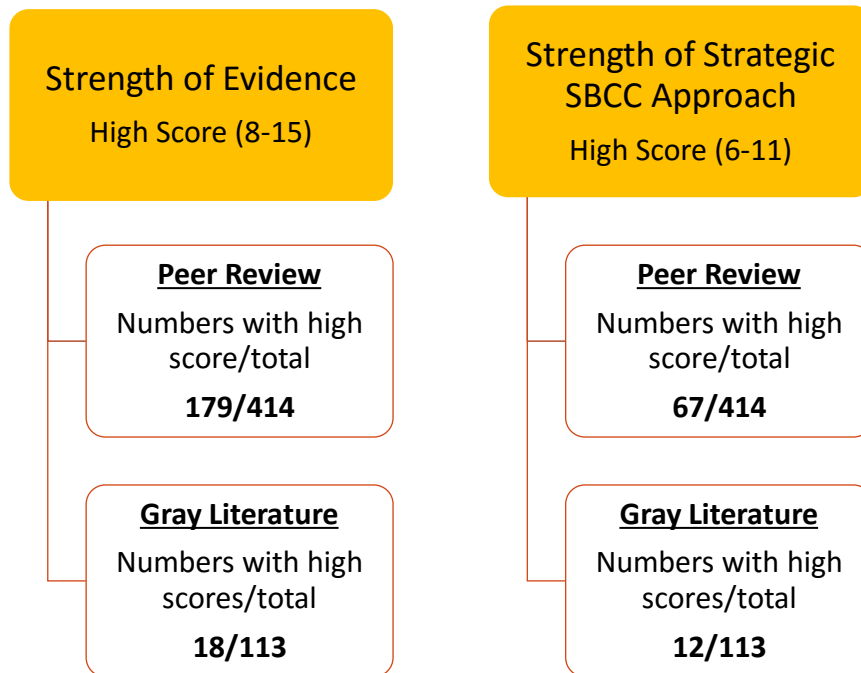
Articles were excluded from the review if they: (1) did not describe SBCC interventions, (2) were not implemented in an LMIC, (3) were not about an SBCC intervention nor a meta-analysis/synthesis of multiple programs, (4) did not report on behaviors or influencing factors in at least one malaria-related outcome, and/or (5) were not in English.

The research team identified documents through an abstract review. When reviewing abstracts, the team assigned articles a score of one to four stars to determine whether to include them in the evidence review, with one star symbolizing that the article was “not relevant,” two stars symbolizing that the article could include “relevant citations,” three stars symbolizing that the article “could help with formative research” and four stars symbolizing that the article “includes impact evidence.” Four hundred and fourteen peer-reviewed articles and 113 gray literature reports received four stars.

III. Review the Literature

Following the screening of abstracts, the selected four-star articles went through a full-text review. The full-text review included the coding of articles in two primary areas: (1) strength of evidence, and (2) strength of strategic SBCC approach. The scoring system is included in **Appendix D**. The first criterion, strength of evidence, focuses on the rigor in study design, methodology and sampling. The second criterion, strength of strategic SBCC approach, examines the SBCC focus of the article in terms of theory, audience selection, pretesting of materials, etc. Strength of evidence scores were very different in the peer-reviewed literature compared to the gray literature. As many as 179 of 414 peer-reviewed papers scored high on strength of evidence compared to only 18 of 113 gray literature reports (**Figure 2**).

Figure 2: Strength of evidence and strategic approaches by peer review and gray literature



With regard to the strength of the strategic SBCC approach, both peer-reviewed and gray literature articles had low scores overall. Only 67 peer-reviewed papers and 12 gray literature reports had a high score (from 6-11). This finding indicates that malaria research journals and reports often do not describe the use of theory, audience segmentation, channel selection or other strategic processes in the design of their SBCC interventions.

Quality Checks

The lead researcher assured the quality of the full-text review by double-checking the coding of the three researchers working on the project. The lead researcher also checked for accuracy of screening by reviewing the articles that were not selected. Gray literature was reviewed again by the lead researcher because very few reports (113) were selected from a total of 1,403 documents. The reason for low selection from gray literature was that many documents were either Demographic and Health Survey (DHS) reports or family planning or HIV reports.

Another quality check included reviewing the accuracy of scoring for inclusion into the malaria database. Weekly team meetings were held to review progress, address problems and reach consensus on inclusion and exclusion criteria and coding.

IV. Outcomes

Searchable Malaria Database

The searchable malaria database was culled from 545 papers and reports (414 peer-reviewed and 113 gray literature). As the team reviewed the literature, we realized there were two types of papers/reports under the category of behavioral impact. First, papers that assessed the exposure and impact of an SBCC intervention on malaria-related behaviors and, second, papers that measured behavior change but did not assess or adequately describe the SBCC intervention or the target audiences' exposure to it. The papers in the first category constitute the evidence base for the impact of SBCC interventions on malaria prevention and treatment behaviors. Although there are several lessons to be learned from articles in the second category, this evidence review and the resulting Malaria SBCC Evidence Package only features articles that measured the exposure and impact of SBCC interventions. **Table 1** provides a distribution of the papers/reports included in the malaria database.

Table 1. Distribution of articles included in the Malaria SBCC Evidence Database, by malaria topic areas

Malaria topics	SBCC impact on malaria prevention and treatment behaviors
Overall malaria database	80*
ITN	39
Malaria in pregnancy	10
Case management/ service provider behaviors	42
IRS	5
*Note: Sum of the malaria topic areas is greater than 80 because there are overlaps among topic areas.	

Criteria for selection into the database are provided in **Appendix E**. The overall database has a total of 80 papers/reports that includes both peer-reviewed papers and gray literature, demonstrating evidence of the impact of SBCC interventions on malaria prevention and treatment behaviors.

Fact sheets and Infographics

The Malaria SBCC Evidence Package includes fact sheets and infographics featuring SBCC activities that demonstrated impact on three focus areas: ITNs, case management and service provider behavior change. The team wanted the fact sheets to showcase a variety of SBCC approaches, behavioral outcomes and use of theory.

Selection criteria for the approximately ten papers for each fact sheet include:

- (a) Different strategic SBCC approaches
- (b) Different SBCC interventions
- (c) A set of behavioral outcomes
- (d) A few papers illustrating SBCC impact on influencing factors
- (e) A few papers illustrating the use of theory

The infographics include key findings of SBCC's impact on each malaria topic.

IMPACT OF SBCC ON KEY FOCUS AREAS

Impact of SBCC on ITN-related Behaviors

A total of 39 papers assessed and reported an impact of SBCC interventions on ITN-related behaviors. The papers covered studies from many countries throughout Africa, Asia and Latin America. The ITN impact papers measured behaviors such as ITN ownership, use (the night before the survey), ever use, use by key populations (e.g., children and/or pregnant women), repair and maintenance, and use of ITN hammocks in forest areas. About 20 of the 39 papers used an integrated approach in which ITN use was combined with another malaria prevention or treatment behavior, such as IPTp uptake, prompt care-seeking for fever, IRS, etc.

Boulay, et al. (2014), utilized two different methods of analysis (propensity score matching and treatment effect modeling) to demonstrate that SBCC exposure led to increased ITN use in Zambia.⁷ An assessment of the NightWatch activities in Cameroon found that ITN use increased in those exposed, especially in children under five (2013).⁸ The evidence indicated that exposure to radio had a significant association with ITN use behavior.

The papers depicted several community engagement strategies, from involving volunteers and community health workers (CHWs) to engaging with informal leaders. A two-step model of community engagement was used in Ethiopia by providing skills-based training on ITNs to heads of households.⁹ Through these sessions, trainees learned how to hang an ITN and promoted its use to other households in their neighborhood.

Through a randomized control trial (RCT) in Togo, Desrochers, et al. (2014), demonstrated that the more intense the intervention, the higher the effect on ITN use.¹⁰ In this study, the implementation of two additional follow-up home visits led to increased ITN use.

ITN impact in the evidence was measured using two denominators, the first with all respondents from the sample (pregnant women, children under five, etc.) and the second with ITN use among those who owned an ITN. The extent of impact depended on the SBCC approach used, the media mix and the intensity of the SBCC activities.

⁷Boulay, M., Lynch, M., & Koenker, H. (2014). Comparing two approaches for estimating the causal effect of behaviour-change communication messages promoting insecticide-treated bednets: an analysis of the 2010 Zambia malaria indicator survey. *Malaria Journal*, 13(1), 342.

⁸Bowen, H. L. (2013). Impact of a mass-media campaign on bednet use in Cameroon. *Malaria Journal*, 12(1), 36.

⁹A. Deribew, Z. Birhanu, L. Sena, T. Dejene, A. A. Reda, M. Sudhakar, F. Alemseged, F. Tessema, A. Zeynudin, S. Biadgilign and K. Deribe (2012). The effect of household heads training on long-lasting insecticide-treated bed nets utilization: a cluster randomized controlled trial in Ethiopia *Malar J*, 11, 99

¹⁰Desrochers, R.E, Siekmans, K., Berti, P.R., Bramhill, K., Buchan, S.A., Battah, G.K., Gbetoglo, D., Vignikin, K., and Sabino, A. (2014). Effectiveness of post-campaign, door-to-door, hang-up, and communication interventions to increase long-lasting, insecticidal bed net utilization in Togo (2011-2012): a cluster randomized, control trial *Malar J*, 13, 260.

Impact of SBCC on Malaria Case Management and Service Providers

There were 42 malaria case management papers/reports and 15 service provider-focused papers/reports that demonstrated an association between an SBCC intervention and case management behavior change. All 15 service provider documents overlap with those in the malaria case management category, so for the purposes of this report, evidence showing the impact of SBCC on malaria case management and service providers is summarized together. There were also some overlaps between case management and service providers and other malaria areas such as IPTp, ITNs, IRS, etc., due to the integrated approach used by programs in promoting malaria-related behaviors.

The programs discussed in the identified studies and reports covered individual countries in Asia and Africa and, in some cases, multiple countries. Treatment behaviors that were measured to assess the impact of SBCC within the case management and service provider categories included care-seeking/treatment-seeking, and treatment adherence. Malaria prevention practices, such as using ITNs, eliminating mosquito breeding sites and seeking IRS, were also assessed. Service provider behaviors measuring the impact of SBCC interventions included proper execution of the RDT process, performance in counseling and dispensing of malaria drugs and providing referrals.

An RCT conducted in India by Das, et al. (2014), around malaria case management compared interventions of community mobilization paired with supportive supervision of CHWs on effective malaria case management (arm A), community mobilization alone (arm B) and a control group.¹¹ The study looked at the effectiveness of the two service delivery models on reducing the malaria burden in 40 villages in India and showed that both arms (A and B) had significantly higher improvements in ITN use and treatment-seeking from a CHW and/or a trained provider, compared to the control group. In the fever cases, care-seeking and receiving proper treatment were timelier in both arms, whether from a CHW or another trained provider, compared to the control arm. Supportive supervision was shown to provide CHWs with the guidance and resources to properly provide malaria-related information, testing, treatment and services.

Another RCT in Kenya by Zurovac, et al. (2011), showed the impact of SMS reminders sent to health workers in improving and maintaining their adherence to national guidelines for the management of outpatient pediatric malaria.¹² The intervention arm showed immediate improvements in the health workers' performance in following the national guidelines and the steps associated with them to properly counsel, test and treat children within their assigned communities.

¹¹ Das, A., Friedman, J., Kandpal, E., Ramana, G.N., Gupta, R.K., Pradhan, M.M., and Govindaraj, R. (2014). Strengthening malaria service delivery through supportive supervision and community mobilization in an endemic Indian setting: an evaluation of nested delivery models *Malar J*, 13(#issue#), 482

¹² Zurovac, D., Sudoi, R. K., Akhwale, W. S., Ndiritu, M., Hamer, D. H., Rowe, A. K., & Snow, R. W. (2011). The effect of mobile phone text-message reminders on Kenyan health workers' adherence to malaria treatment guidelines: a cluster randomised trial. *Lancet*, 378(9793), 795–803

The papers/reports within the malaria case management and service provider categories highlighted the impact of SBCC approaches on the provider behaviors influencing proper testing and treatment, as well as the household-level behaviors, such as ITN use and care-seeking. These examples highlighted the cascading effect of quality SBCC, and its ability to influence both providers' case management practices, as well as households' prevention and treatment behaviors.

Impact of SBCC on Malaria in Pregnancy

Ten papers on malaria in pregnancy demonstrated an association between an SBCC intervention and malaria prevention and/or treatment behaviors. These studies are from several sub-Saharan African countries.

A Burkina Faso study conducted by Gies, et al. (2008, 2009), was a cluster RCT that assessed the impact of a community engagement intervention on the use of IPTp by pregnant women during their antenatal (ANC) visits.^{13,14} A community-based promotional campaign was planned after formative research and it showed a significant impact on pregnant women completing their IPTp. The study provided a good example of an integrated campaign that included training health facility and community health providers, and implementing an effective community engagement strategy.

The gray literature report (2015) on the Tanzania Capacity and Communication Project illustrated a dose-response relationship between campaign exposure and uptake of two or more doses of sulfadoxine-pyrimethamine (SP) during pregnancy as well as an increase in ANC visits.¹⁵ This study provided a detailed description of a national integrated multi-media SBCC campaign designed using an integrated change model.

A study from Ghana (2009) used an innovative strategy of integrating malaria SBCC with microfinance clients.¹⁶ The intervention increased knowledge of malaria complications during pregnancy and showed an impact on ITN ownership and use.

These papers provided an evidence base on how SBCC programs have influenced pregnant women to complete their ANC checkups and take two SP doses. The papers reported a national-level campaign (Tanzania), a district-level intervention (Burkina Faso) and a community-level microfinance SBCC malaria initiative (Ghana).

¹³Gies, S., Coulibaly, S. O., Ouattara, F. T., Ky, C., Brabin, B. J., & D'Alessandro, U. (2008). A community effectiveness trial of strategies promoting intermittent preventive treatment with sulphadoxine-pyrimethamine in pregnant women in rural Burkina Faso. *Malaria Journal*, 7(1), 180.

¹⁴Gies, S., Coulibaly, S. O., Ky, C., Ouattara, F. T., Brabin, B. J., & D'Alessandro, U. (2009). Community-based promotional campaign to improve uptake of intermittent preventive antimalarial treatment in pregnancy in Burkina Faso. *The American Journal of Tropical Medicine and Hygiene*, 80(3), 460-469.

¹⁵Field-Nguer, M. L., Musonda, K., Matee, N. F., Mwanza, M., Mwitwa, A., Mwingizi, D., ... & Ernest, R. The Tanzania Capacity and Communication Project (TCCP): a performance evaluation. Promoting healthy behaviors and building social and behavior change capacity in Tanzania.

¹⁶De La Cruz, N., Crookston, B., Gray, B., Alder, S. and Dearden, K. (2009). Microfinance against malaria: impact of Freedom from Hunger's malaria education when delivered by rural banks in Ghana *Trans R Soc Trop Med Hyg*, 103(12), 1229-36

Discussion

The malaria SBCC evidence review presents a consolidated appraisal of SBCC interventions for malaria prevention and treatment. Associations between SBCC programs and malaria-related behavioral outcomes are assessed from peer-reviewed and gray literature. A rigorous review process identified approximately 80 papers/reports that measured SBCC exposure and behavior change for malaria SBCC programs. Key deliverables of the SBCC review include, a searchable database, three fact sheets and three infographics. The review also included 90 papers/reports where behavior change is measured but the exposure to the SBCC program is not mentioned or assessed. While these papers can be of use to malaria SBCC programs, they highlight the major research gaps uncovered in the review. In addition, the review included papers with non-significant or negative SBCC program effects.

The database can be searched by behavior, country, type of communication intervention and audience, providing multiple options related to malaria and SBCC. The database includes program effects of interpersonal, community engagement, mass media and mHealth interventions. Further, fact sheets and infographics summarize strategic findings for malaria topics such as ITNs, case management and service provider behavior. The audience for the fact sheets and infographics are policy-makers and program personnel.

Of the 545 SBCC and malaria papers/reports selected for detailed review, about 90 papers/reports fell in the category where malaria-related behavior change is measured but the associated SBCC program and exposure is not reported. These papers highlight research gaps in the reporting of programs, especially in peer-reviewed journals. Strategic SBCC components such as channel selection, audience definition and segmentation, behavioral or communication theory, program fidelity, etc. weren't reported in this set of papers/reports. The evidence for SBCC's impact on malaria prevention and treatment can be substantially strengthened if SBCC program descriptions, exposure and fidelity are reported. Lack of program exposure variables create a gap in attributing behavior change to SBCC interventions.

The overall review also included papers/reports where SBCC programs did not achieve significant program effects. A multi-channel program in three countries (Ecuador, Colombia and Nicaragua) had a poor behavioral impact in Nicaragua on administration of chloroquine due to the limited implementation of the promotional activities.¹⁷ Similarly, a program where household heads promoted ITNs to neighbors in rural Ethiopia had a much larger program effect on overall ITN use compared to ITN use for children under five years of age.¹⁸

¹⁷ Axel Kroeger, R. M., Mancheno, M., & Gonzalez, M. (1996). Health education for community-based malaria control: an intervention study in Ecuador, Colombia and Nicaragua.

¹⁸ <https://malariajournal.biomedcentral.com/articles/10.1186/1475-2875-11-99> | Deribew, A., Birhanu, Z., Sena, L., Dejene, T., Reda, A. A., Sudhakar, M., ... & Deribe, K. (2012). The effect of household heads training on long-lasting insecticide-treated bednets utilization: a cluster randomized controlled trial in Ethiopia. *Malaria Journal*, 11(1), 99.

Overall, the SBCC malaria review provides evidence on the role of SBCC programs in enabling behavior change in malaria prevention and treatment programs. The searchable database, fact sheets and infographics provide focused summaries on malaria SBCC interventions.

Limitations to the Evidence Review Process

Campaigns

The research team found there was a great deal of confusion between mass media health promotion campaigns and ITN distribution campaigns. Research journals, as well as gray literature reports, need to ensure that the two are adequately distinguished. Unfortunately, the term “campaign” is used ambiguously and it creates confusion around whether an activity is an SBCC campaign. The details of SBCC/demand generation components of ITN distribution campaigns need to be included to avoid this problem.

SBCC Interventions

SBCC programs are not adequately described in peer-reviewed journals. A basic description of program components is essential for global malaria SBCC practitioners, policy-makers and researchers to learn from the study findings and apply or adopt them.

The evidence review found that peer-reviewed papers were stronger on study design features and weaker on measurement of coverage or exposure. Often journal articles did not even describe the health communication or behavior change intervention or mention the use of theoretical and program frameworks. Program exposure was not commonly included in peer-reviewed papers.

The evidence review team also specifically examined the content of papers that received low scores on the two scoring criteria of strength of evidence and/or strategic SBCC approach. Overall these articles did not measure SBCC exposure and would not have been eligible for inclusion in the database. The team found that these papers did not differ from the higher scoring in any systematic way outside of the criteria assessed during the article review scoring.

Key Takeaways from the Malaria SBCC Evidence

The review of malaria SBCC literature provided the evidence and trends on which SBCC strategic approaches, interventions and channels are most likely to lead to change in malaria prevention and treatment behaviors. The evidence review also sheds light on how to strengthen research and reporting around malaria-related SBCC in peer-reviewed and gray literature.

Best Practices for Malaria SBCC

Emphasizing and reinforcing specific health behaviors leads to a higher program effect

Although communicating the risk of malaria and giving access to necessary tools such as ITNs and RDTs are important, providing target populations with specific actionable steps through SBCC was found to be more successful. Programs that emphasize specific health behaviors, such as sleeping under an ITN, going to four ANC checkups, seeking early treatment for fever, etc., are most likely to achieve substantial behavior change, compared to campaigns only focused on raising risk perception.

Innovative mHealth approaches

Malaria control programs should consider the use of SMS technology to improve malaria prevention and treatment behaviors. This is especially true for case management behaviors, where there is more evidence. For example, SMS texts with reminders and motivational messages can foster an enabling environment and provide a prompt to action for the implementation of case management practices that are already accepted as the clinical norm by service providers. Text reminders to community health workers have been shown to increase adherence to guidelines, provide motivation for performance and lead to the creation of habit and improved outcomes. Use of mHealth, in turn, can also allow for ongoing monitoring and evaluation toward improved case management practices.

Mass media

The evidence strongly supports the use of mass media in promoting malaria prevention and treatment behaviors. While the majority of the evidence focuses on ITN use, mass media has been shown to increase the uptake of other prevention and treatment behaviors. Malaria control programs seeking to ensure that their investments in ITN distributions do not go to waste should consider mass media options, as it offers a possible route to close the gap between ITN access and use.

Multi-channel approach

Apart from mass media approaches to increase reach and influence malaria-related behaviors, the evidence makes a case for multi-channel approaches. Efforts that combined mass media with other approaches—such as community mobilization or engagement; information, education and materials; use of community health and outreach workers and health facility programs—were strongly associated with increased attitudes about ITNs. These positive attitudes were then found to significantly increase the odds of universal coverage. In fact, evidence supports a dose-response relationship between the number of information sources to number of message recalls. The higher the number of information sources, the higher the message recall from the intervention. Evidence also supports a dose-response of number of information sources and message recalls to the likelihood of adoption/maintenance of malaria-related behaviors. Messages reinforced by various sources resulted in increased ITN use and treatment-seeking. Evidence suggests that no single channel alone could reach more than one-fourth or one-third of

the households, providing strong evidence that a multi-channel, multi-media approach is needed to reach high levels of SBCC campaign exposure.

Integrated programs

Integrated multi-media SBCC programs covering three malaria focal areas – LLIN use, malaria in pregnancy and case management – demonstrated impact on multiple behaviors. Given the overlap of the target audiences and the behaviors, malaria control programs should consider an integrated SBCC approach when promoting prevention and treatment behaviors.

SBCC program design using context

The evidence suggests that it is important to conduct formative research and address community-specific practices and attitudes through targeted messaging prior to/alongside related programs, such as mass distribution campaigns. Malaria messages that resonate with the audience through their cultural, interpersonal and seasonal behaviors and priorities have a better reach and are more likely to influence the desired outcome. As the database covers SBCC programs from 34 countries, it provides examples of context-specific malaria SBCC approaches.

Community-designed campaigns

The evidence strongly suggests using community change agents and community leaders/influencers, as well as community mobilization and community engagement efforts, to influence behaviors. Community-led efforts have been shown to resonate better with the target audience and influence attitudes and practices within the community as a whole. These community-led efforts have also shown indirect and informal malaria-related behavior promotion through friends and family.

Case management and home management

The evidence supports that community-based proactive case detection reduces symptomatic malaria prevalence, likely through more timely case management and improved care-seeking behavior. Programs that emphasized systematic referral training for various community agents (village drug kit managers, CHWs, drug vendors, etc.) were most likely to have successful referral utilization outcomes. Interpersonal training that emphasizes referral mechanisms should be provided to community agents. The quality of counseling and case management was shown to be enhanced by supportive supervision at the community level. It is an important step that resulted in rapid gain of skills in community workers. Strengthening the counseling skills of fieldworkers is an add-on that SBCC provides to community programs. Programs that increase access to and promote the proper use of RDTs contribute to early detection of malaria and early treatment-seeking. Evidence also supports that training local mother coordinators/trainers can have positive implications for antimalarial uptake of children under five. In addition, developing and using guidelines with adequate training significantly improved the correctness of malaria treatment with chloroquine at home. Adoption of this mode of intervention to improve compliance with antimalarial use at home. Case management and home management of malaria have been shown to help with barriers to prompt and proper care-seeking.

Research Gaps

There is a lack of understanding and precise measurements of social norms and beliefs that might have been influenced by SBCC campaigns. The evidence shows that SBCC campaigns focus on social norms and beliefs to promote malaria-related behaviors, but very few follow up to measure whether there was normative change that came out of those SBCC campaigns.

Furthermore, there is also a lack of research identifying the gaps between access to resources for malaria-related behaviors and actual adoption and maintenance of those behaviors. Qualitative inquiry with target audiences in specific contexts could help shed light on these gaps between access and use, and inform malaria SBCC programming.

There is limited evidence demonstrating the impact of SBCC programs on behaviors related to the prevention of malaria in pregnancy, such as IPTp uptake, ANC attendance, and ITN use among pregnant women. A better understanding of the role of SBCC activities on the behaviors of pregnant women and households with pregnant women would help program managers to better target their messages, and subsequently improve the effectiveness of their programs.

Peer-reviewed articles are not adequately describing SBCC programs. A basic description of program components can be essential for global malaria practitioners, policy-makers and researchers to learn from and apply the study findings.

Conclusions

There is a strong evidence base showing that SBCC programs can help improve malaria prevention and treatment behaviors. However, more work needs to be done to ensure that best practices are documented and used consistently.

The review provides recommendations for strengthening peer-reviewed research papers by including strategic communication processes in journal articles. Reporting program exposure is essential for establishing the role of SBCC interventions in malaria prevention and treatment behaviors.

Appendix A: Search Terms/Criteria

PubMed Search 8.31.2016

Hits: 3,372 on 8.31.16

Note that [MeSH] tells PubMed to search for the term in the Medical Subject Heading field only; [tiab] means search in the title and abstract; * is a wild card and searches for variations of the word ending.

Search Structure: "Malaria" AND "SBCC keywords" AND "LMIC keywords"

Search:

("Malaria"[Mesh] OR malaria*[tiab] OR Remittent Fever*[tiab] OR Plasmodium Infection*[tiab] OR Marsh Fever*[tiab] OR blackwater fever*[tiab])

AND

("Social Behavior"[Mesh] OR "Telemedicine"[Mesh] OR "Education"[Mesh] OR Health Knowledge, Attitudes, Practice [mesh] OR health communication[mesh] OR "Mass Media"[Mesh] OR "Publications"[Mesh:noexp] OR "Serial Publications"[Mesh] OR Advocat*[tiab] OR advocac*[tiab] OR Behavior change[tiab] OR SBCC[tiab] OR BCC[tiab] OR Mass media campaign[tiab] OR Interpersonal communication[tiab] OR information technolog*[tiab] OR Information Communication Technolog*[tiab] OR ICT[tiab] OR Digital Health[tiab] OR Demand generation[tiab] OR IEC[tiab] OR (information[tiab] AND education[tiab] AND communication[tiab]) OR Campaign*[tiab] OR Communication*[tiab] OR Community participation[tiab] OR Community based organization*[tiab] OR "community organization"[tiab] OR Civil Society Organization*[tiab] OR Community mobilization[tiab] OR Community outreach[tiab] OR Community-based intervention*[tiab] OR counseling[tiab] OR Mass media[tiab] OR mobile app*[tiab] OR public service announcement*[tiab] OR Radio[tiab] OR small group intervention*[tiab] OR Social empowerment[tiab] OR Social marketing[tiab] OR social media[tiab] OR Social mobilization[tiab] OR social network*[tiab] OR Television[tiab] OR website*[tiab] OR text message*[tiab] OR SMS[tiab] OR MMS[tiab] OR tablet[tiab] OR ipad[tiab] OR PDA[tiab] OR pico projector[tiab] OR mhealth[tiab] OR mobile health[tiab] OR m-health[tiab] OR electronic health[tiab] OR ehealth[tiab] OR e-health[tiab] OR cell phone*[tiab] OR mobile phone*[tiab] OR smart phone*[tiab] OR social norm*[tiab] OR social support*[tiab] OR social pressure[tiab] OR social influence[tiab] OR ((Communication*[tiab] OR interaction*[tiab] OR intervention*[tiab] OR outreach[tiab] OR counseling[tiab]) AND (community health worker*[tiab] OR health provider*[tiab] OR peer*[tiab] OR partner*[tiab] OR Antenatal Care Provider*[tiab] OR ANC Provider*[tiab] OR Service provider*[tiab] OR caregiver*[tiab])))

AND

((("developing country"[tiab] OR "developing countries"[tiab] OR "developing nation"[tiab] OR "developing nations"[tiab] OR "developing population"[tiab] OR "developing populations"[tiab] OR "developing world"[tiab] OR "less developed country"[tiab] OR "less developed countries"[tiab] OR "less developed nation"[tiab] OR "less developed nations"[tiab] OR "less developed world"[tiab] OR "lesser developed countries"[tiab] OR "lesser developed nations"[tiab] OR "under developed country"[tiab] OR "under developed countries"[tiab] OR

"under developed nations"[tiab] OR "under developed world"[tiab] OR "underdeveloped country"[tiab] OR "underdeveloped countries"[tiab] OR "underdeveloped nations"[tiab] OR "underdeveloped population"[tiab] OR "underdeveloped world"[tiab] OR "middle income country"[tiab] OR "middle income countries"[tiab] OR "middle income nation"[tiab] OR "middle income nations"[tiab] OR "middle income population"[tiab] OR "middle income populations"[tiab] OR "low income country"[tiab] OR "low income countries"[tiab] OR "low income nations"[tiab] OR "low income population"[tiab] OR "low income populations"[tiab] OR "lower income country"[tiab] OR "lower income countries"[tiab] OR "lower income nations"[tiab] OR "lower income population"[tiab] OR "lower income populations"[tiab] OR "underserved countries"[tiab] OR "underserved nations"[tiab] OR "underserved population"[tiab] OR "underserved populations"[tiab] OR "under served population"[tiab] OR "under served populations"[tiab] OR "deprived countries"[tiab] OR "deprived population"[tiab] OR "deprived populations"[tiab]) OR ("poor country"[tiab] OR "poor countries"[tiab] OR "poor nation"[tiab] OR "poor nations"[tiab] OR "poor population"[tiab] OR "poor populations"[tiab] OR "poor world"[tiab] OR "poorer countries"[tiab] OR "poorer nations"[tiab] OR "poorer population"[tiab] OR "poorer populations"[tiab] OR "developing economy"[tiab] OR "developing economies"[tiab] OR "less developed economy"[tiab] OR "less developed economies"[tiab] OR "underdeveloped economies"[tiab] OR "middle income economies"[tiab] OR "low income economy"[tiab] OR "low income economies"[tiab] OR "low gdp"[tiab] OR "low gnp"[tiab] OR "low gross domestic"[tiab] OR "low gross national"[tiab] OR "lower gdp"[tiab] OR "lower gross domestic"[tiab] OR lmic[tiab] OR lmic[tiab] OR "third world"[tiab] OR "lami country"[tiab] OR "lami countries"[tiab] OR "transitional country"[tiab] OR "transitional countries"[tiab]) OR (Africa[tiab] OR Asia[tiab] OR Caribbean[tiab] OR West Indies[tiab] OR South America[tiab] OR Latin America[tiab] OR Central America[tiab] OR "Atlantic Islands"[tiab] OR "Commonwealth of Independent States"[tiab] OR "Pacific Islands"[tiab] OR "Indian Ocean Islands"[tiab] OR "Eastern Europe"[tiab] OR Afghanistan[tiab] OR Albania[tiab] OR Algeria[tiab] OR Angola[tiab] OR Antigua[tiab] OR Barbuda[tiab] OR Argentina[tiab] OR Armenia[tiab] OR Armenian[tiab] OR Aruba[tiab] OR Azerbaijan[tiab] OR Bahrain[tiab] OR Bangladesh[tiab] OR Barbados[tiab] OR Benin[tiab] OR Byelarus[tiab] OR Byelorussian[tiab] OR Belarus[tiab] OR Belorussian[tiab] OR Belorussia[tiab] OR Belize[tiab] OR Bhutan[tiab] OR Bolivia[tiab] OR Bosnia[tiab] OR Herzegovina[tiab] OR Hercegovina[tiab] OR Botswana[tiab] OR Brasil[tiab] OR Brazil[tiab] OR Bulgaria[tiab] OR Burkina Faso[tiab] OR Burkina Fasso[tiab] OR Upper Volta[tiab] OR Burundi[tiab] OR Urundi[tiab] OR Cambodia[tiab] OR Khmer Republic[tiab] OR Kampuchea[tiab] OR Cameroon[tiab] OR Cameron[tiab] OR Camerons[tiab] OR Cape Verde[tiab] OR Central African Republic[tiab] OR Chad[tiab] OR Chile[tiab] OR China[tiab] OR Colombia[tiab] OR Comoros[tiab] OR Comoro Islands[tiab] OR Comores[tiab] OR Mayotte[tiab] OR Congo[tiab] OR Zaire[tiab] OR Costa Rica[tiab] OR Cote d'Ivoire[tiab] OR Ivory Coast[tiab] OR Croatia[tiab] OR Cuba[tiab] OR Cyprus[tiab] OR Czechoslovakia[tiab] OR Czech Republic[tiab] OR Slovakia[tiab] OR Slovak Republic[tiab] OR Djibouti[tiab] OR French Somaliland[tiab] OR Dominica[tiab] OR Dominican Republic[tiab] OR East Timor[tiab] OR East Timur[tiab] OR Timor Leste[tiab] OR Ecuador[tiab] OR Egypt[tiab] OR United Arab Republic[tiab] OR El Salvador[tiab] OR Eritrea[tiab] OR Estonia[tiab] OR Ethiopia[tiab] OR Fiji[tiab] OR Gabon[tiab] OR Gabonese Republic[tiab] OR Gambia[tiab] OR Gaza[tiab] OR Georgia Republic[tiab] OR Georgian Republic[tiab] OR Ghana[tiab] OR Gold Coast[tiab] OR Greece[tiab] OR Grenada[tiab] OR

Guatemala[tiab] OR Guinea[tiab] OR Guam[tiab] OR Guiana[tiab] OR Guyana[tiab] OR Haiti[tiab] OR Honduras[tiab] OR Hungary[tiab] OR India[tiab] OR Maldives[tiab] OR Indonesia[tiab] OR Iran[tiab] OR Iraq[tiab] OR Isle of Man[tiab] OR Jamaica[tiab] OR Jordan[tiab] OR Kazakhstan[tiab] OR Kazakh[tiab] OR Kenya[tiab] OR Kiribati[tiab] OR Korea[tiab] OR Kosovo[tiab] OR Kyrgyzstan[tiab] OR Kirghizia[tiab] OR Kyrgyz Republic[tiab] OR Kirghiz[tiab] OR Kirgizstan[tiab] OR "Lao PDR"[tiab] OR Laos[tiab] OR Latvia[tiab] OR Lebanon[tiab] OR Lesotho[tiab] OR Basutoland[tiab] OR Liberia[tiab] OR Libya[tiab] OR Lithuania[tiab]) OR (Macedonia[tiab] OR Madagascar[tiab] OR Malagasy Republic[tiab] OR Malaysia[tiab] OR Malaya[tiab] OR Malay[tiab] OR Sabah[tiab] OR Sarawak[tiab] OR Malawi[tiab] OR Nyasaland[tiab] OR Mali[tiab] OR Malta[tiab] OR Marshall Islands[tiab] OR Mauritania[tiab] OR Mauritius[tiab] OR Agalega Islands[tiab] OR "Melanesia"[tiab] OR Mexico[tiab] OR Micronesia[tiab] OR Middle East[tiab] OR Moldova[tiab] OR Moldovia[tiab] OR Moldovian[tiab] OR Mongolia[tiab] OR Montenegro[tiab] OR Morocco[tiab] OR Ifni[tiab] OR Mozambique[tiab] OR Myanmar[tiab] OR Myanma[tiab] OR Burma[tiab] OR Namibia[tiab] OR Nepal[tiab] OR Netherlands Antilles[tiab] OR New Caledonia[tiab] OR Nicaragua[tiab] OR Niger[tiab] OR Nigeria[tiab] OR Northern Mariana Islands[tiab] OR Oman[tiab] OR Muscat[tiab] OR Pakistan[tiab] OR Palau[tiab] OR Palestine[tiab] OR Panama[tiab] OR Paraguay[tiab] OR Peru[tiab] OR Philippines[tiab] OR Philipines[tiab] OR Phillipines[tiab] OR Phillippines[tiab] OR Poland[tiab] OR Portugal[tiab] OR Puerto Rico[tiab] OR Romania[tiab] OR Rumania[tiab] OR Roumania[tiab] OR Russia[tiab] OR Russian[tiab] OR Rwanda[tiab] OR Ruanda[tiab] OR Saint Kitts[tiab] OR St Kitts[tiab] OR Nevis[tiab] OR Saint Lucia[tiab] OR St Lucia[tiab] OR Saint Vincent[tiab] OR St Vincent[tiab] OR Grenadines[tiab] OR Samoa[tiab] OR Samoan Islands[tiab] OR Navigator Island[tiab] OR Navigator Islands[tiab] OR Sao Tome[tiab] OR Saudi Arabia[tiab] OR Senegal[tiab] OR Serbia[tiab] OR Montenegro[tiab] OR Seychelles[tiab] OR Sierra Leone[tiab] OR Slovenia[tiab] OR Sri Lanka[tiab] OR Ceylon[tiab] OR Solomon Islands[tiab] OR Somalia[tiab] OR Sudan[tiab] OR Suriname[tiab] OR Surinam[tiab] OR Swaziland[tiab] OR Syria[tiab] OR Syrian[tiab] OR Tajikistan[tiab] OR Tadhikistan[tiab] OR Tadjikistan[tiab] OR Tadhik[tiab] OR Tanzania[tiab] OR Thailand[tiab] OR Togo[tiab] OR Togolese Republic[tiab] OR Tonga[tiab] OR Trinidad[tiab] OR Tobago[tiab] OR Tunisia[tiab] OR Turkey[tiab] OR Turkmenistan[tiab] OR Turkmen[tiab] OR Tuvalu[tiab] OR Uganda[tiab] OR Ukraine[tiab] OR Uruguay[tiab] OR USSR[tiab] OR Soviet Union[tiab] OR Union of Soviet Socialist Republics[tiab] OR Uzbekistan[tiab] OR Uzbek[tiab] OR Vanuatu[tiab] OR New Hebrides[tiab] OR Venezuela[tiab] OR Vietnam[tiab] OR Viet Nam[tiab] OR West Bank[tiab] OR Yemen[tiab] OR Yugoslavia[tiab] OR Zambia[tiab] OR Zimbabwe[tiab] OR Rhodesia[tiab]) OR (Developing Countries[Mesh] OR Africa[Mesh:noexp] OR Africa, Northern[Mesh:noexp] OR Africa South of the Sahara[Mesh:noexp] OR Africa, Central[Mesh:noexp] OR Africa, Eastern[Mesh:noexp] OR Africa, Southern[Mesh:noexp] OR Africa, Western[Mesh:noexp] OR Asia[Mesh:noexp] OR Asia, Central[Mesh:noexp] OR Asia, Southeastern[Mesh:noexp] OR Asia, Western[Mesh:noexp] OR Caribbean Region[Mesh:noexp] OR West Indies[Mesh:noexp] OR South America[Mesh:noexp] OR Latin America[Mesh:noexp] OR Central America[Mesh:noexp] OR "Atlantic Islands"[Mesh:noexp] OR "Commonwealth of Independent States"[Mesh:noexp] OR "Pacific Islands"[Mesh:noexp] OR "Indian Ocean Islands"[Mesh:noexp] OR "Europe, Eastern"[Mesh:noexp]) OR (Afghanistan[Mesh] OR Albania[Mesh] OR Algeria[Mesh] OR American Samoa[Mesh] OR Angola[Mesh] OR "Antigua and Barbuda"[Mesh] OR

Argentina[Mesh] OR Armenia[Mesh] OR Azerbaijan[Mesh] OR Bahrain[Mesh] OR "Baltic States"[Mesh] OR Bangladesh[Mesh] OR Barbados[Mesh] OR Benin[Mesh] OR "Republic of Belarus"[Mesh] OR Belize[Mesh] OR Bhutan[Mesh] OR Bolivia[Mesh] OR Bosnia-Herzegovina[Mesh] OR Botswana[Mesh] OR Brazil[Mesh] OR Bulgaria[Mesh] OR Burkina Faso[Mesh] OR Burundi[Mesh] OR Cambodia[Mesh] OR Cameroon[Mesh] OR Cape Verde[Mesh] OR Central African Republic[Mesh] OR Chad[Mesh] OR Chile[Mesh] OR China[Mesh] OR Colombia[Mesh] OR Comoros[Mesh] OR Congo[Mesh] OR Costa Rica[Mesh] OR Cote d'Ivoire[Mesh] OR Croatia[Mesh] OR Cuba[Mesh] OR Cyprus[Mesh] OR Czechoslovakia[Mesh] OR Czech Republic[Mesh] OR Slovakia[Mesh] OR Djibouti[Mesh] OR "Democratic Republic of the Congo"[Mesh] OR "Democratic People's Republic of Korea"[Mesh] OR Dominica[Mesh] OR Dominican Republic[Mesh] OR East Timor[Mesh] OR Ecuador[Mesh] OR Egypt[Mesh] OR El Salvador[Mesh] OR Eritrea[Mesh] OR Estonia[Mesh] OR Ethiopia[Mesh] OR "Equatorial Guinea"[Mesh] OR Fiji[Mesh] OR "French Guiana"[Mesh] OR Gabon[Mesh] OR Gambia[Mesh] OR "Georgia (Republic)"[Mesh] OR Ghana[Mesh] OR Greece[Mesh] OR Grenada[Mesh] OR Guatemala[Mesh] OR Guinea[Mesh] OR Guinea-Bissau[Mesh] OR Guam[Mesh] OR Guyana[Mesh] OR Haiti[Mesh] OR Honduras[Mesh] OR Hungary[Mesh] OR "Independent State of Samoa"[Mesh] OR India[Mesh] OR Indonesia[Mesh] OR Iran[Mesh] OR Iraq[Mesh] OR Jamaica[Mesh] OR Jordan[Mesh] OR Kazakhstan[Mesh] OR Kenya[Mesh] OR Korea[Mesh] OR Kyrgyzstan[Mesh] OR Laos[Mesh] OR Latvia[Mesh] OR Lebanon[Mesh] OR Lesotho[Mesh] OR Liberia[Mesh] OR Libya[Mesh] OR Lithuania[Mesh] OR "Macedonia (Republic)"[Mesh] OR Madagascar[Mesh] OR (Malawi[Mesh] OR Malaysia[Mesh] OR Mali[Mesh] OR Malta[Mesh] OR Mauritania[Mesh] OR Mauritius[Mesh] OR "Melanesia"[Mesh] OR Mexico[Mesh] OR Micronesia[Mesh] OR Middle East[Mesh:noexp] OR Moldova[Mesh] OR Mongolia[Mesh] OR Montenegro[Mesh] OR Morocco[Mesh] OR Mozambique[Mesh] OR Myanmar[Mesh] OR Namibia[Mesh] OR Nepal[Mesh] OR Netherlands Antilles[Mesh] OR New Caledonia[Mesh] OR Nicaragua[Mesh] OR Niger[Mesh] OR Nigeria[Mesh] OR Oman[Mesh] OR Pakistan[Mesh] OR Palau[Mesh] OR Panama[Mesh] OR Papua New Guinea[Mesh] OR Paraguay[Mesh] OR Peru[Mesh] OR Philippines[Mesh] OR Poland[Mesh] OR Portugal[Mesh] OR Puerto Rico[Mesh] OR "Republic of Korea"[Mesh] OR Romania[Mesh] OR Russia[Mesh] OR "Russia (Pre-1917)"[Mesh] OR Rwanda[Mesh] OR "Saint Kitts and Nevis"[Mesh] OR Saint Lucia[Mesh] OR "Saint Vincent and the Grenadines"[Mesh] OR Samoa[Mesh] OR Saudi Arabia[Mesh] OR Senegal[Mesh] OR Serbia[Mesh] OR Montenegro[Mesh] OR Seychelles[Mesh] OR Sierra Leone[Mesh] OR Slovenia[Mesh] OR Sri Lanka[Mesh] OR Somalia[Mesh] OR South Africa[Mesh] OR Sudan[Mesh] OR Suriname[Mesh] OR Swaziland[Mesh] OR Syria[Mesh] OR Tajikistan[Mesh] OR Tanzania[Mesh] OR Thailand[Mesh] OR Togo[Mesh] OR Tonga[Mesh] OR "Trinidad and Tobago"[Mesh] OR Tunisia[Mesh] OR Turkey[Mesh] OR Turkmenistan[Mesh] OR Uganda[Mesh] OR Ukraine[Mesh] OR Uruguay[Mesh] OR USSR[Mesh] OR Uzbekistan[Mesh] OR Vanuatu[Mesh] OR Venezuela[Mesh] OR Vietnam[Mesh] OR Yemen[Mesh] OR Yugoslavia[Mesh] OR Zambia[Mesh] OR Zimbabwe[Mesh])) OR (("less-developed"[tiab] AND population*[tiab]) OR ("lesser-developed"[tiab] AND (country[tiab] OR nation[tiab] OR population*[tiab] OR world[tiab])) OR (under-developed[tiab] AND (nation[tiab] OR population*[tiab])) OR ("underdeveloped"[tiab] AND (nation[tiab] OR populations[tiab])) OR ("low-income"[tiab] AND "nation"[tiab]) OR ("lower-income"[tiab] AND "nation"[tiab]) OR ("underserved"[tiab] OR "under-served"[tiab] OR "deprived"[tiab] OR "poorer"[tiab]) AND

(countr*[tiab] OR nation*[tiab] OR "world"[tiab])) OR (("lesser-developed"[tiab] OR "under-developed"[tiab] OR "underdeveloped"[tiab] OR "middle income"[tiab] OR "lower-income"[tiab]) AND Econom*[tiab])) OR "South Sudan"[Mesh]

POPLINE Search 12.7.2016

malaria* OR "Remittent Fever*" OR "Plasmodium Infection*" OR "Marsh Fever*" OR "blackwater fever*"

AND

"Social Behavior" OR Telemedicine OR Education OR "Health Knowledge" OR "Health Attitudes" OR "Health Practice" OR "Knowledge Attitudes" OR "health communication" OR "Mass Media" OR Publication* OR "Serial Publication*" OR Advocat* OR advocac* OR "Behavior change" OR SBCC OR BCC OR "Mass media campaign*" OR "Interpersonal communication" OR "information technolog*" OR "Information Communication Technolog*" OR ICT OR "Digital Health" OR "Demand generation" OR IEC OR (information AND education AND communication) OR Campaign* OR Communication* OR "Community participation" OR "Community based organization*" OR "community organization" OR "Civil Society Organization*" OR "Community mobilization" OR "Community outreach" OR "Community-based intervention*" OR counseling OR "mobile app*" OR "public service announcement*" OR Radio OR "small group intervention*" OR "Social empowerment" OR "Social marketing" OR "social media" OR "Social mobilization" OR "social network*" OR Television OR website* OR "text message*" OR SMS OR MMS OR tablet OR ipad OR PDA OR "pico projector" OR mhealth OR "mobile health" OR m-health OR "electronic health" OR ehealth OR e-health OR "cell phone*" OR "mobile phone*" OR "smart phone*" OR "social norm*" OR "social support*" OR "social pressure" OR "social influence" OR ((Communication* OR interaction* OR intervention* OR outreach OR counseling) AND ("community health worker*" OR "health provider*" OR peer* OR partner* OR "Antenatal Care Provider*" OR "ANC Provider*" OR "Service provider*" OR caregiver*))

Gray Literature Search Documentation

Gray Literature Search Documentation started 10.28.2016

- FHI360 searched
- USAID searched
- Gates searched
- DFID searched
- Population Services International searched
- ACT watch searched
- Catholic Relief Services searched
- Lutheran World Relief searched
- World Vision searched
- AfriCare searched
- Amazon Malaria Initiative searched
- Chemonics searched
- ABT Associates searched
- URC searched
- Malaria No More searched
- BBC Media Action searched
- Speak Up Africa searched

Department for International Development

Used built-in site search

--UK gov't. site: documents, DFID, Malaria, 37 total

--downloaded items with potential for including research findings

PSI

Used built-in search for resource library

--87 items for Malaria; 16 for "social"

Catholic Relief Services

Searched "malaria" one hit

Lutheran World Relief

Technical Profiles:

Searched "malaria" no hits

Browsed 29 report titles and abstracts

Evaluations:

Searched "malaria" no hits

Browsed 10 report titles and abstracts

World Vision

News stories only about Malaria (no communications research) two on malaria:

<https://www.worldvision.org/health-news-stories/malaria-mosquitoes-breed-disaster-burundi>

and one family profile

Amazon Malaria Initiative

Reviewed Resources pages; downloaded communication reports

Seven total downloads

Chemonics

Searched site for “malaria” site search returned 83 hits but included rfps, index pages with the word malaria, e.g.

Identified and downloaded two documents

<http://www.chemonics.com/OurImpact/SharingImpact/ImpactStories/Pages/Using-Mobile-Technology-to-Improve-Malaria-Testing,-Care,-and-Reporting.aspx>

ABT Associates

Went to “malaria” in practice areas, scrolled to resources at bottom of page. Reviewed eight titles and downloaded two:

Feasibility and Effectiveness of mHealth for Mobilizing Households for Indoor Residual Spraying to Prevent Malaria: A Case Study In Mali Keith Mangam, Elana Fiekowsky, Moussa Bagayoko, Laura Norris, Allison Belemvire, Rebecca Longhany, Christen Fornadel, Kristen George 6(2016).
Feasibility and Effectiveness of mHealth for Mobilizing Households for Indoor Residual Spraying to Prevent Malaria: A Case Study in Mali Global Health: Science and Practice Journal 4(2):222-237

MHealth Matters: People, Money & Performance Case Studies from Africa Lena Kolyada, Elana Fiekowsky, Beth Brennan, Keith Mangam

URC Center for Human Services

On Resources page selected “malaria” and “health communications and behavior change”

Look on target, but cannot download citations:

[http://www.urc-chs.com/our-resource-library?rt\[0\]=2&rt\[1\]=12&rt\[2\]=13&rt\[3\]=14&rt\[4\]=15&rt\[5\]=16&rt\[6\]=17&rt\[7\]=18&rt\[8\]=19&rt\[9\]=20&rt\[10\]=21&rt\[11\]=22&rt\[12\]=23&ap\[0\]=161&ap\[1\]=162&ap\[2\]=163&ap\[3\]=164&ap\[4\]=165&ap\[5\]=166&ap\[6\]=167&ex\[0\]=149&kw=&items_per_page=50](http://www.urc-chs.com/our-resource-library?rt[0]=2&rt[1]=12&rt[2]=13&rt[3]=14&rt[4]=15&rt[5]=16&rt[6]=17&rt[7]=18&rt[8]=19&rt[9]=20&rt[10]=21&rt[11]=22&rt[12]=23&ap[0]=161&ap[1]=162&ap[2]=163&ap[3]=164&ap[4]=165&ap[5]=166&ap[6]=167&ex[0]=149&kw=&items_per_page=50)

or:

<http://tinyurl.com/jdhxgvr>

Malaria No More

<https://www.malarianomore.org/pages/our-impact>

News and advocacy, not research reports

BBC Media Action

<http://www.bbc.co.uk/mediaaction/publications-and-resources/research/summaries/asia/cambodia/malaria>

One hit for “malaria” and research

Speak Up Africa

No built-in search, used Google site: <http://www.speakupafrica.org/> malaria

87 hits, but seem to be short news reports, e.g.:

<http://www.speakupafrica.org/news/2014/1/27/new-control-intervention-to-avert-75-of-malaria-episodes-across-sahel-and-west-africa-region>

Or profiles of communication campaigns:

<http://www.speakupafrica.org/news/2016/4/29/local-champions-to-reach-zero-malaria-one-community-at-a-time>

Thursday November 3, 2016

FHI

No malaria literature

Appendix B: Inclusion-Exclusion Requirements after Initial Search

Inclusion Criteria

I. Malaria

1. Fever
2. Anemia
3. Prevalence
4. Morbidity
5. Mortality
6. Treatment of fever
7. Antimalarial drugs
8. Prevention
9. Adherence
10. Compliance
11. Insecticide-treated bed nets (ITNs) use/sleeping under
12. Long-lasting insecticide-treated nets (ITNs) use/sleeping under
13. ITN/ITN care and repair
14. Universal Coverage Campaigns (UCC)
15. Antenatal care (ANC)
16. Intermittent Preventive Treatment (IPTp) for pregnant women
17. Prophylactic use of antimalarial drugs
18. Sulfadoxine-pyrimethamine (SP)
19. Prompt care (appropriate and timely) treatment-seeking for children less than 5 years of age with fever
20. Malaria case management
21. Home-based malaria management (HMM)
22. Integrated community case management of malaria (iCCM)
23. Malaria Rapid Diagnostic Tests (RDTs)
24. Artemisinin-based Combination Therapy (ACT)
25. Indoor Residual Spraying (IRS)

AND

II. SBCC

1. Training
2. Education
3. Behavior change
4. Behavior change communication
5. Social and behavior change communication
6. Mass media campaign
7. Interpersonal communication
8. Counseling
9. mHealth
10. Information Communication Technology (ICT)
11. Digital Health
12. Demand generation
13. IEC (information, education, communication)
14. Advocacy
15. Impact

II. Community mobilization

1. Community participation
2. Community-based organizations
3. Civil Society Organizations (CSOs)
4. Faith-based Organizations (CBOs)
5. Community, Rights and Gender (CRG)
6. Committees (peoples, village, health, malaria prevention)
7. Federations/umbrella organizations

III. Determinants of Prevention, Control and Treatment Behaviors

1. Knowledge
2. Attitudes
3. Practices
4. Knowledge, attitudes, and practices (KPC)
5. Exposure (malaria prevention messages)
6. Coverage (interventions)
7. Misconceptions
8. Myths
9. Social norms
10. Household/Partner/Peer communication
11. Risk perception
12. Self-efficacy (for malaria prevention behaviors)
13. Knowledge (symptoms, causes, ways to avoid, prevention, treatment)
14. Social influence/social pressure (believe others are adopting malaria prevention behaviors)
15. Emotion toward prevention products and actions (includes positive and negative emotions)
16. Sociocultural belief systems
17. Convenience (of adopting preventive behaviors)

IV. SBCC providers

1. Community health workers (CHWs)
2. Community volunteers
3. ANC providers
4. Health providers
5. Service providers
6. Caregivers
7. Other

EXCLUSION CRITERIA

1. Malaria biology
2. Malaria pathology

Appendix C: Inclusion-Exclusion Criteria during Abstract Screening

Articles included if they:

- Describe communication interventions implemented
- Were implemented in low- and middle-income countries
- Focus on a single intervention or include a meta-analysis or synthesis of multiple programs
- Report on behaviors or influencing factors that impact malaria-related interventions
- Are in English

Articles excluded if they:

- Do not describe communication interventions
- Are not from/implemented in an LMIC
- Do not report on behaviors or influencing factors in at least one malaria-related outcome
- Are not about an SBCC intervention
- Are not in English

Inclusion criteria for screening full-text articles

- (a) Behavior change related to malaria
- (b) SBCC interventions related to malaria
- (c) Malaria SBCC work should be in LMICs
- (d) Determinants of malaria behavior change

Interventions to be searched included:

- (a) Long-lasting insecticide-treated nets (ITNs)
- (b) Indoor residual spraying (IRS)
- (c) Intermittent preventative treatment of malaria for pregnant women (IPTp)
- (d) Case management of malaria (prompt care-seeking and provider adherence to rapid diagnostic testing and treatment guidelines)
- (e) SBCC for pre-elimination and elimination efforts

Exclusion Criteria

- (a) Malaria diagnostics
- (b) Malaria biology
- (c) Malaria pathology
- (d) Surveillance
- (e) Antimalarial drugs
- (f) Insecticide resistance
- (g) Antimalarial drugs resistance
- (h) Malaria vaccines

Four-Star Rating System for Screening

- * Reject
- **References could be useful
- *** Formative research/underlying factors
- **** Program impact on underlying factors or behaviors

Appendix D: Scoring Systems for Full-Text Review

Code list for Malaria SBCC Evidence Review

I. Background Information

No.	Background variables
1.1	Name of paper
1.2	Authors
1.3	Journal/source
1.4	Year of publication/year of report (for unpublished articles)
1.5	Type of study 1. Qualitative 2. Quantitative 3. Mixed methods

II. Strength of Article/Report

	Elements	Scoring
2.1 Type of study design (0-2)	<ul style="list-style-type: none"> a. Were appropriate outcomes used (defined as whether they matched the desired change)? b. Does the study compare outcomes using pre- and post-intervention data? c. Does the study compare treatment and comparison groups (or a simulation)? d. Does the study use post-intervention data that measures different levels of exposure? e. Were the comparison/treatment groups similar at baseline? f. Was the study an RCT or a cluster RCT? 	0: < two elements 1: two elements 2: three or more elements
2.2 Population-representative sampling	<ul style="list-style-type: none"> a. How was the population sampled? (0-2) 	0: convenience or purposive sampling 1: basic random sampling 2: for two-stage random cluster, stratified sampling

	b. Was the population representative? (0-1)	0: representative of small area (e.g., village or town), 1: sub-nationally/regionally representative 1: nationally representative
2.3 Measured outcomes (0-2)	<ul style="list-style-type: none"> a. Were statistics beyond p-values reported (e.g., chi-square, odds ratios, t-tests, ANOVA, etc.)? b. Did the program measure and analyze data on potentially influencing factors? c. Did the program measure and analyze data on behavioral outcomes? 	0: <=1 element 1: two elements 2: three elements
2.4 Data Analysis (0-3)	<p><i>Practical significance/association and bias:</i></p> <ul style="list-style-type: none"> a. Was causal attribution assessed (i.e., strength, consistency, specificity, theoretical coherence, plausibility, dose-response, temporality, responsiveness)? b. Were confidence intervals reported? c. Was there a discussion/analysis of other possible factors that could have influenced the results? d. Did the article/program document cost, process evaluation, unintended consequences, strengths/limitations/lessons learned, etc.? e. Were the results plausible given the intervention (population, intervention, control, outcomes)? 	0: < 2 elements 1: two elements present, 2: three elements present 3: four or more elements present
2.5 Peer Review (0-1)	Was the article peer-reviewed?	0 : gray literature 1 : peer-reviewed

III. Program Effects

	Elements	Scoring
3.1a (0-2)	Did the program result in a statistically significant change in potentially influencing factors (e.g., knowledge, attitudes, social norms, social support, couple communication, household communication, emotions, health service utilization, provider satisfaction, etc.), with significance considered based on context of the predictor? (Ideally, no less than Odds Ratio = 2, but odds ratios may not be mentioned in gray literature.)	<p>0: no significant change</p> <p>1: one significant influencing factor (knowledge change, attitudes, social norms, social influence, social support, couple communication, household communication, health service utilization, provider satisfaction, etc.)</p> <p>2: two or more significant influencing factors</p>
3.1b	Which potential influencing factors change? Please list.	<p>1.</p> <p>2.</p>
3.2a (0-2)	Did the program result in statistically significant desired changes in behavioral outcomes?	<p>0: no significant change</p> <p>1: influencing practices (such as attending ANC, obtaining net, etc. - write out list of practices/will keep iterative list of practices)</p> <p>1 additional point for increase in desired behavior outcome (will</p>

		write out list of behavior outcomes)
3.2b	Which behavioral outcome/s changed? Please list.	1. 2.

IV. Health Communication Benchmark Criteria (Strategic Approaches?)

	Elements	Scoring
4.1 Strategic Campaign Goals: (0-3)		
	Intervention is designed to influence desired behavioral outcome – and not just influencing factors (e.g., knowledge, attitudes, beliefs, norms, etc.)	0: program not designed for behavioral outcome 1: program designed for behavioral outcome
	Intervention strategy recognizes intermediate outcomes/influencing factors (e.g., attitudes, knowledge, beliefs, norms, etc.) and works to address them	0: no focus on intermediate outcomes 1: focus on intermediate outcomes
	Clear, specific, measurable and time-bound communication and behavior objectives have been set, baselines and key indicators established	0: communication and behavior objectives not set 1: communication or behavior objectives set or key indicators established
4.2 Strategic Campaign Design		
4.21 Theory		
a. (0-1)	Was the program informed by behavior change, communication or another relevant theory?	0: none used 1: if theory is used
b.	Which theory was used? Please list.	1. 2.

c. (0-1)	Did the program develop and use a conceptual framework/program theory that illustrates how the program envisions behavior change to occur in the given context?	0/1 1: if conceptual framework/program theory is used
4.22a Strategic Process (0-2)	<ul style="list-style-type: none"> a. Was the program designed using some type of strategic process (e.g., P-Process, partner and stakeholder involvement)? b. Was the strategy/were the materials pretested or piloted? c. Was the program designed using formative research? d. Was the program modified based on midline/intermediate/routine monitoring information? 	0: < 2 elements 1: two elements present 2: three or more elements
4.22b	Which strategic process(es) was/were used (if named)?	1. 2.
4.23a Use of audience segmentation/targeting (0-2)	<ul style="list-style-type: none"> a. Were the messages and approaches directly tailored to needs of a specific audience, based on results of primary and/or secondary formative research? b. Were audiences prioritized based on findings of formative research or some other type of data, not convenience (i.e., mandated)? c. Did the article/project include messages for influencing secondary audiences? 	0: no elements 1: one element 2: two or more elements
4.23b	Who was the audience? Please list.	1. 2.
4.24a Channel selection (0-1)	Did the article/project use a mix of communication channels (i.e., mass media, interpersonal communication, etc.)?	0: no media mix 1: media mix
4.24b	Which channels were used? Please list.	
4.3 Campaign Implementation (0-1)	Did the article/project track duration, frequency, reach, exposure, dose-response and quality of content? Did they achieve a desired level of reach and exposure that was appropriate for their targets and goals?	0: no element 1: tracked frequency or reach or exposure

Scoring for the tool

I	Strength of article	0-11 points
II	Program effects	0-4 points
III	Strategic Communication Approaches (Benchmarks)	0-11 points
Total		26 points

Appendix E: Selection Criteria for Inclusion in the Database

STRENGTH OF EVIDENCE

- LOW SCORE: 0-5
- MEDIUM SCORE: 5-10
- HIGH SCORE: 11-15

STRENGTH OF STRATEGIC SBCC APPROACH

- LOW SCORE: 0-3
- MEDIUM SCORE: 4-7
- HIGH SCORE: 8-11

Inclusion criteria

1. Has a high score for strength of evidence and strength of strategic approach
2. Has a high score for strength of evidence and low score for strength of strategic approach
3. Has a high score for strategic approach and if there is a behavioral impact

Exclusion criteria

1. Has low scores for strength of evidence and strength of strategic approach
2. Has a high score for strategic approach and no behavioral impact