Malaria Social and Behavior Change Communication Evidence Discussion Series IV:

The impact of behaviour change communication on the use of insecticide treated nets: a secondary analysis of ten post-campaign surveys from Nigeria

Wednesday, March 25, 9:00–10:00 a.m. EDT

Moderators: Chantelle Owens, U.S. President's Malaria Initiative
Michael Toso, Johns Hopkins Center for Communication Programs
Presenter: Dr. Albert Kilian, co-founder of Tropical Health, former Technical Director and now retired Senior Expert

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Breakthrough ACTION FOR SOCIAL & BEHAVIOR CHANGE

Today’s moderator

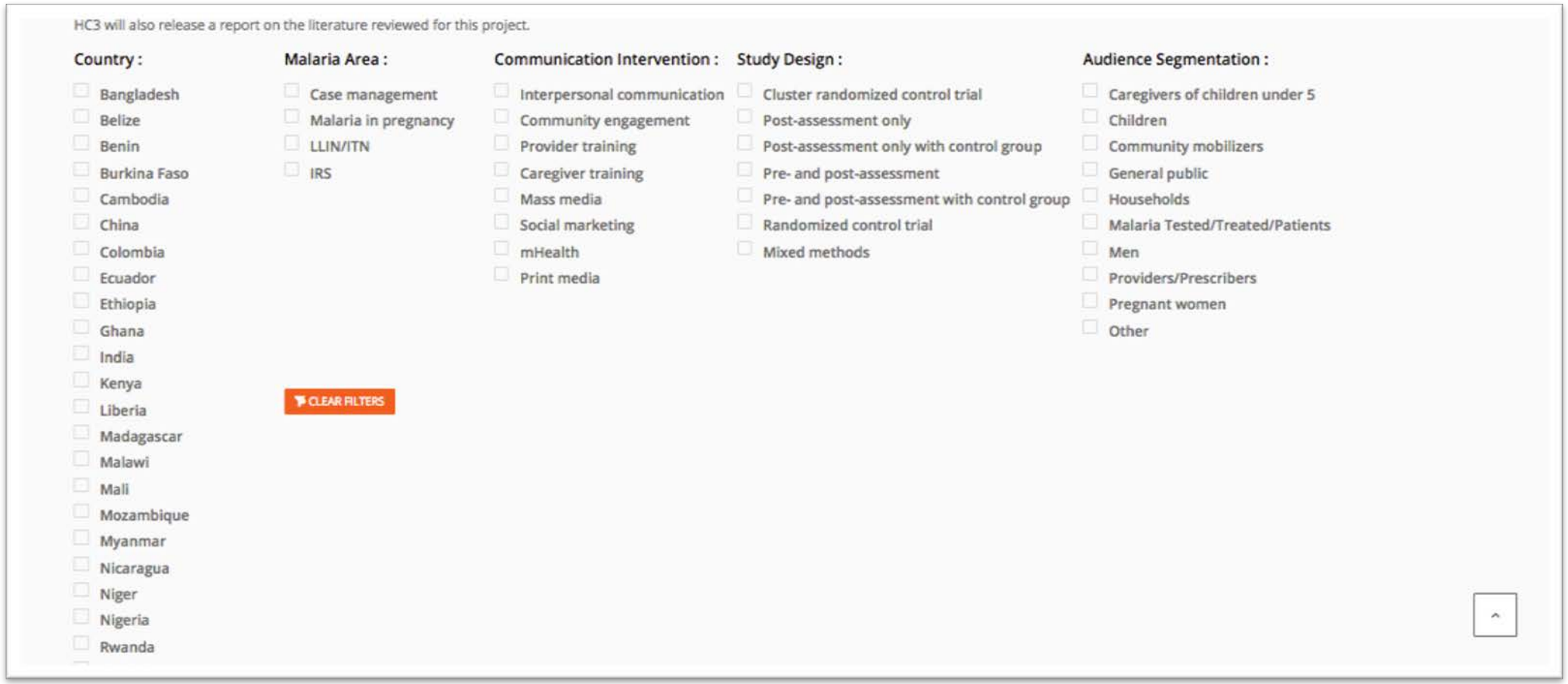
Chantelle Owens

U.S. President’s Malaria Initiative

Discussion overview

- Study overview
- Methods
- Results
- Programmatic implications
- Discussion

Malaria SBC Evidence Database



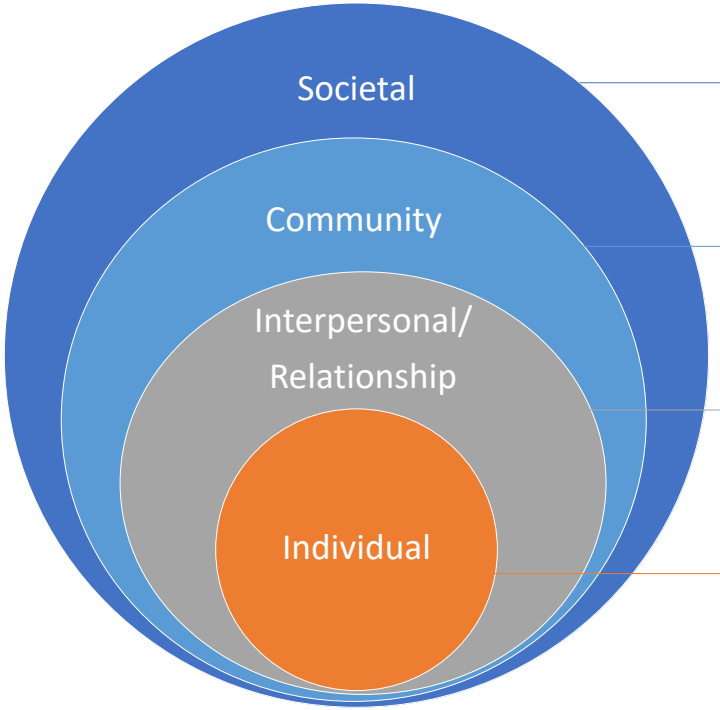
www.healthcommcapacity.org/malaria-evidence-database

Today’s featured presenter

Albert Kilian

Tropical Health

Socio-ecological model lens



Societal
Health system (health worker interpersonal communication)

Community
Local mediator (local, faith-based, and political leaders) advocacy, awareness raising by town criers

Interpersonal/Relationship
Communication through social networks (family, friends)

Individual
Radio, drama show, television, newspaper, leaflets, posters, distribution point materials

Study overview

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Discussion Guide

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Impact: Which behavioral or health outcomes were measured by the surveys and how were they measured?

Study design: What kind of study design (e.g., cross-sectional, longitudinal, pre-post, other) and analytical measures were used? What steps were taken to avoid bias?

Study analysis: How confident can we be that the behaviors being practiced are a result of SBC and not of confounding factors?

Generalizability: Were the groups surveyed in this study representative of 10 states as a whole? Can lessons learned in this study be applied beyond these 10 states in Nigeria?

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Study objectives

- The goal of this secondary analysis was to investigate the influence of social and behavior change (SBC) on insecticide-treated net (ITN) hanging and use
- Outcomes in this analysis were defined as the effects of SBC message exposure and recall on knowledge, attitudes, perceptions, intentions, and actual ITN use
- The analysis was undertaken to assist the Nigeria National Malaria Elimination Programme fine-tune its SBC strategy for ITNs

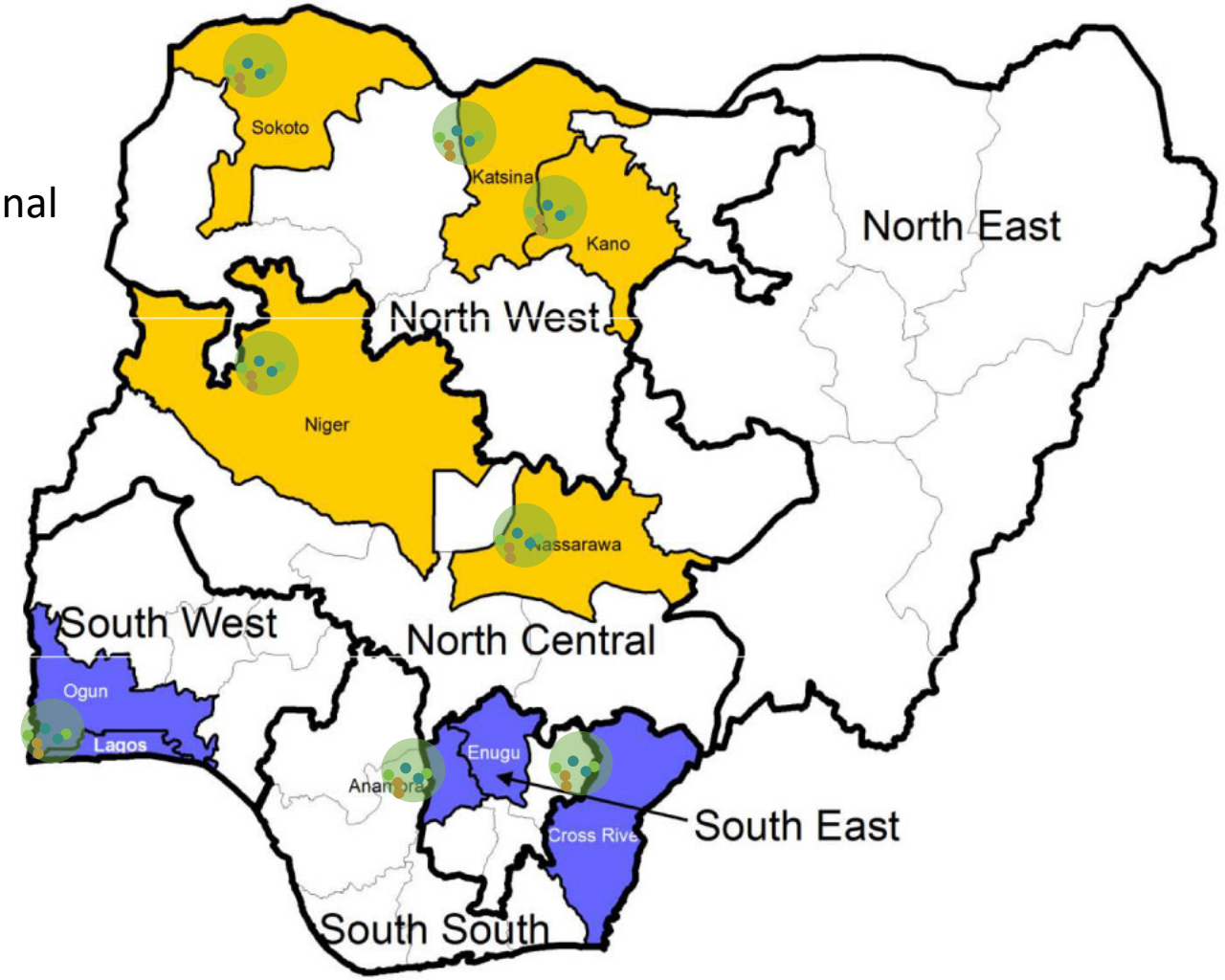
Survey overview

- Surveys were completed between 2009 and 2012 in Sokoto, Katsina, Kano, Niger, Nasarawa, Anambra, Enugu, Ogun, Lagos, and Cross River states
- Two projects
  - Support to National Malaria Programme (SuNMaP) funded by Ukaid
  - NetWorks funded by the U.S. President's Malaria Initiative
- All surveys planned and implemented by the Malaria Consortium
- The primary objective of the surveys was to track the result of the ITN mass distributions within 6-12 months of the campaigns

Sampling

- Representative State samples
- Two-stage cluster sampling
- Clusters selected with probability proportional to size (PPS)
- Households selected with simple random sample (SRS)
- One respondent per household (HH)

State	Sample Size		
	Households	Nets	Individuals
Sokoto	1,008	1,271	4,468
Katsina	1,017	1,532	4,630
Kano	987	1,173	4,642
Niger	1,001	1,280	6,270
Nasarawa	1,015	1,136	5,323
Anambra	1,012	1,781	4,546
Enugu	1,020	1,444	4,644
Ogun	952	745	4,373
Lagos	1,020	937	4,486
Cross River	1,254	1,316	5,656
TOTAL	**10,286**	**12,615**	**49,038**



Methods

Study design, intervention, data collection, analysis

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Methods: Designed and measured outcomes

- This was **not** an intervention trial but rather a cross-sectional observational assessment of one moment in time
- SBC interventions were those implemented by States and varied in timing and intensity
- Outcome measures available were ITN hanging and ITN use in households
- Exposure variables were SBC messages heard in last six months and their source
- Additional variables captured respondent message recall and household perceptions and attitudes

Methods: Analytical approach

- The analytical challenge was to establish a link of ITN use with SBC messages while controlling for other factors that influence ITN use (e.g., availability of nets, season) as well as those that influence exposure to SBC
- This was approached in three steps

Methods: Analytical approach

1. Exposure to SBC measured:
   - Coverage—any exposure
   - Intensity—number of information sources
   - Communication channel—characterized by reach for target population
2. Link between recall of any content vs. specific messages established:
   - Dose-response relationship between exposure and recall
3. Association between message recall and net hanging and use mediators
   - **Confidence in taking action to protect family with nets**
   - **Reported discussing of net use within the family**
   - **Expressed intention to use the nets every night**

Methods: Analytical approach

- Discussing ITN use and intention to use was directly assessed through questionnaire
- Confidence to take action was assessed through a series of Likert-type questions

Methods: Analytical approach

Strongly disagree — Strongly agree

-2 -1 0 1 2

I can protect family from getting malaria

I can hang ITNs above all sleeping spaces

I can obtain enough ITNs for all children

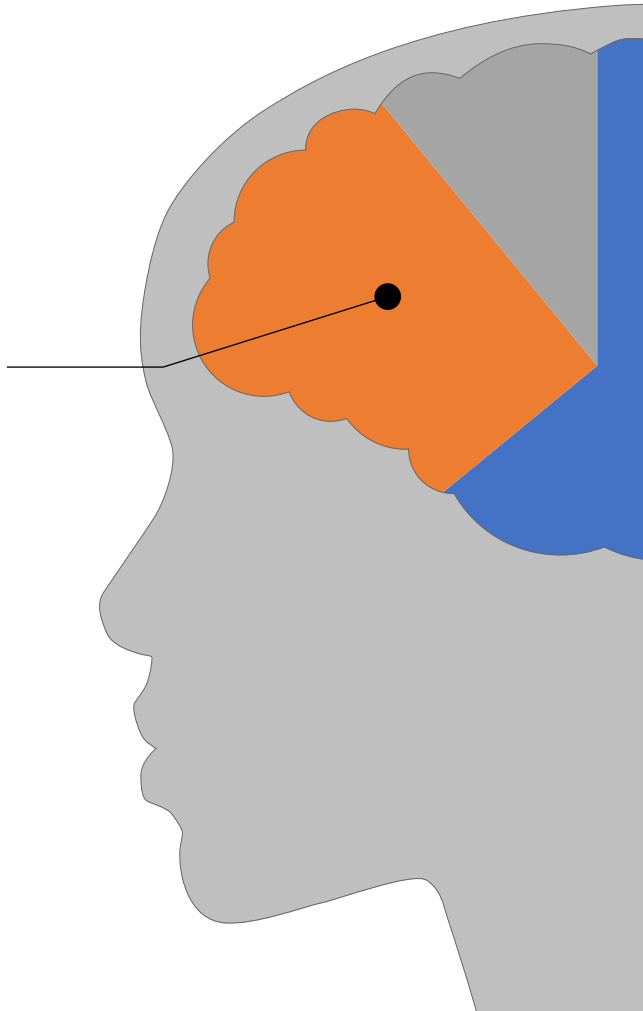
I can save enough money to obtain ITNS for all children

I can sleep under ITN every night of the year

I can get all children to sleep under ITN

Confidence

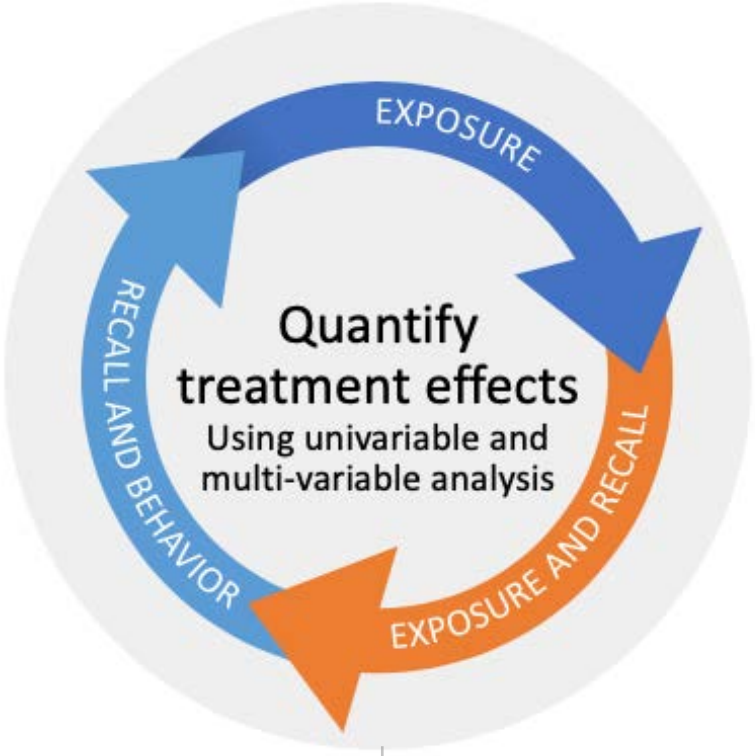
in the ability to protect one's family with ITNs



Methods: Analytical approach

- The means score was then taken per household
- Score grouped from “poor” (<0) to “excellent” (>1.5)
- A similar assessment was done for knowledge and perception

Methods: Analytical approach



Measure exposure to SBC	Link recall with messages	Correlate recall with action
Coverage, intensity, channels	Dose-response: exposure and recall	Message recall correlated with behaviors?

Methods: Analytical approach

- To assess impact of SBC on net use, the three composite SBC outcome measures were then linked to hanging and use of nets
- Multivariable modeling was used to measure impact
- Nested treatment effect model that combines a model for the outcome with a model for the intervention (treatment) in order to estimate a counterfactual for each observation
  - What would have happened if an exposed household would not have been exposed and vice versa; thereby allowing an evaluation of the treatment effect alone
- The statistical procedure used was inverse-probability weight regression adjustment

Results

Intervention outcomes

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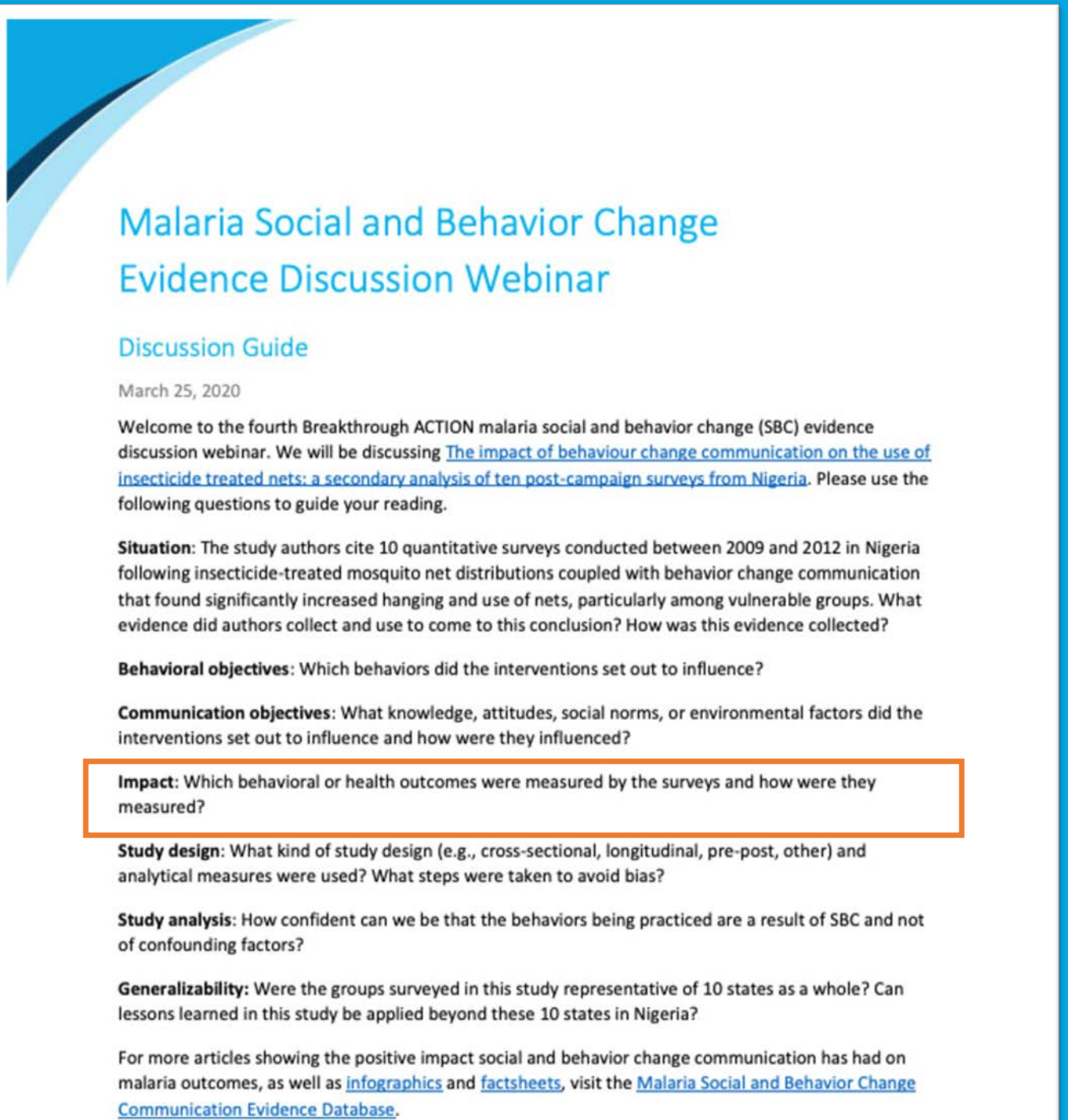

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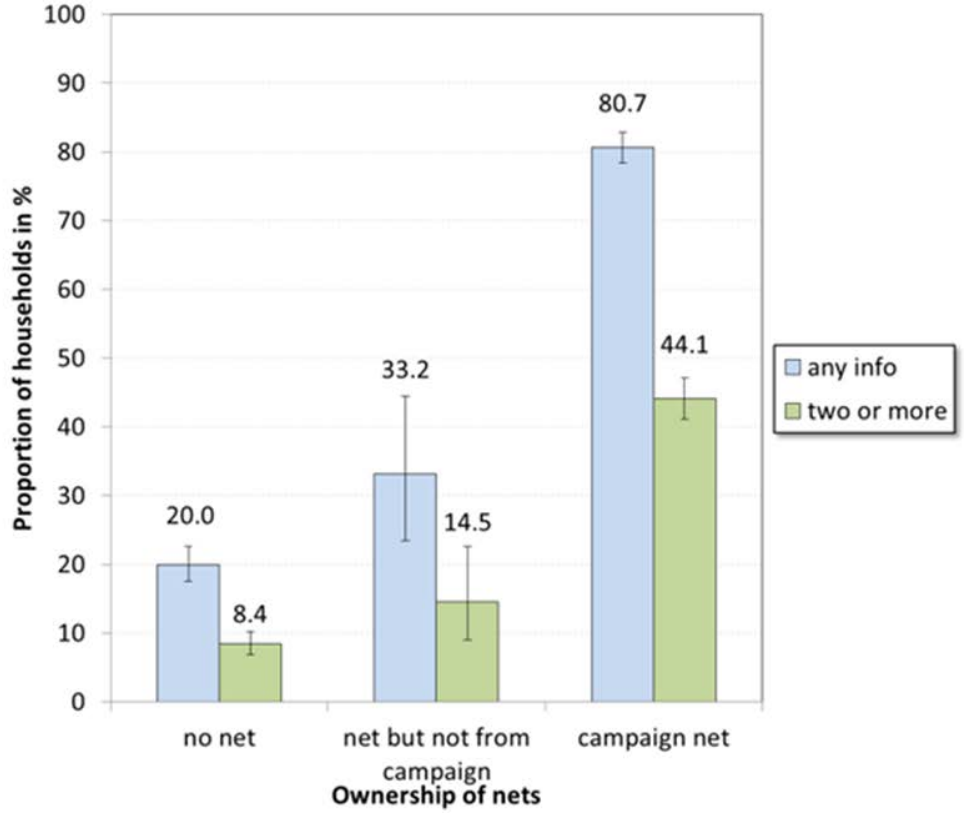
Step 1: Exposure to SBC messages

- Overall 58% of households had been exposed to messages on net hanging and use
- Strongest positive association:
  - net ownership and campaign participation
  - time since campaign



- Other positive factors: larger family with children, female headed HH, radio ownership
- No association:
  - wealth quintiles
  - education of head of HH
  - urban/rural
  - North/South

Key results: Determinants of information exposure

Campaign: 19.7%
Distribution point: .1%
Leaflet: 14.6%
Team: 6.2%

Media: 21.5%
Radio: 16.4%
Drama: 5.9%
Press: .1%

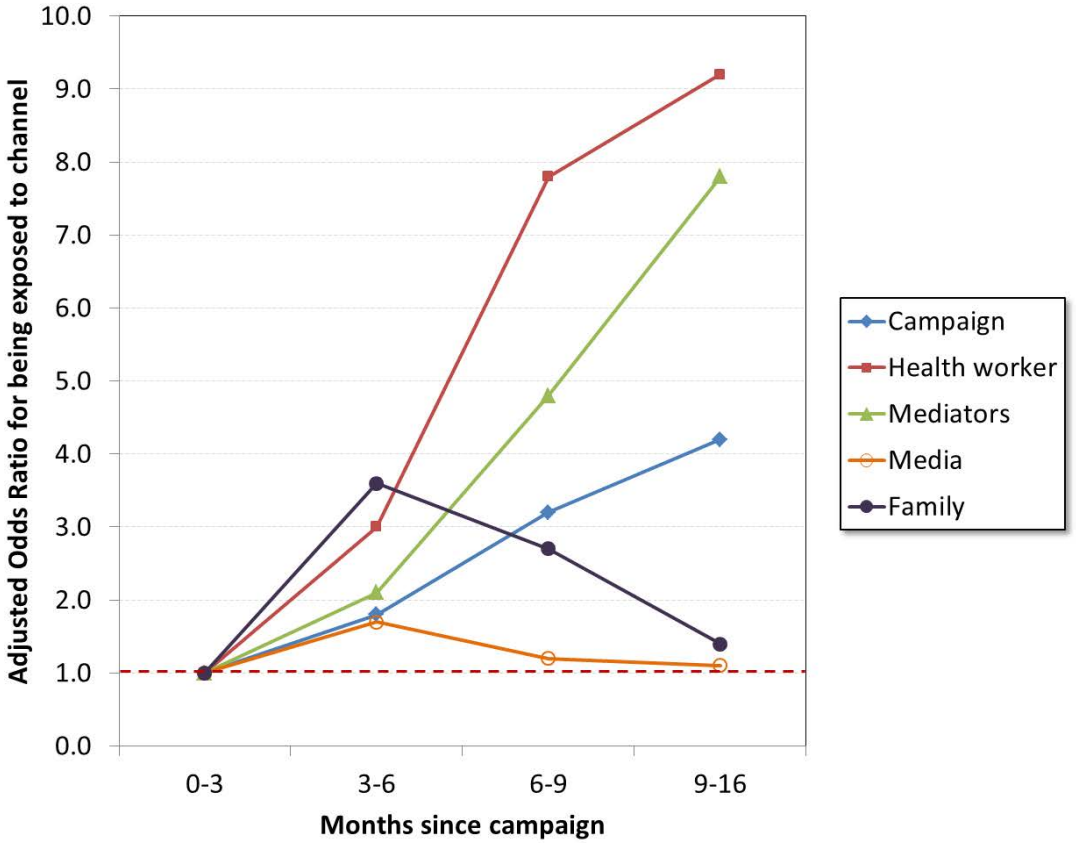
Mediators: 15.7%
Leaders: 9.6%
Town announcer: 6.3%
Faith-based: 1.9%

Health system: 18.6%
Health worker: 18.6%

Social network: 14.8%
Family or friends: 14.8%

Step 1: Exposure to SBC messages

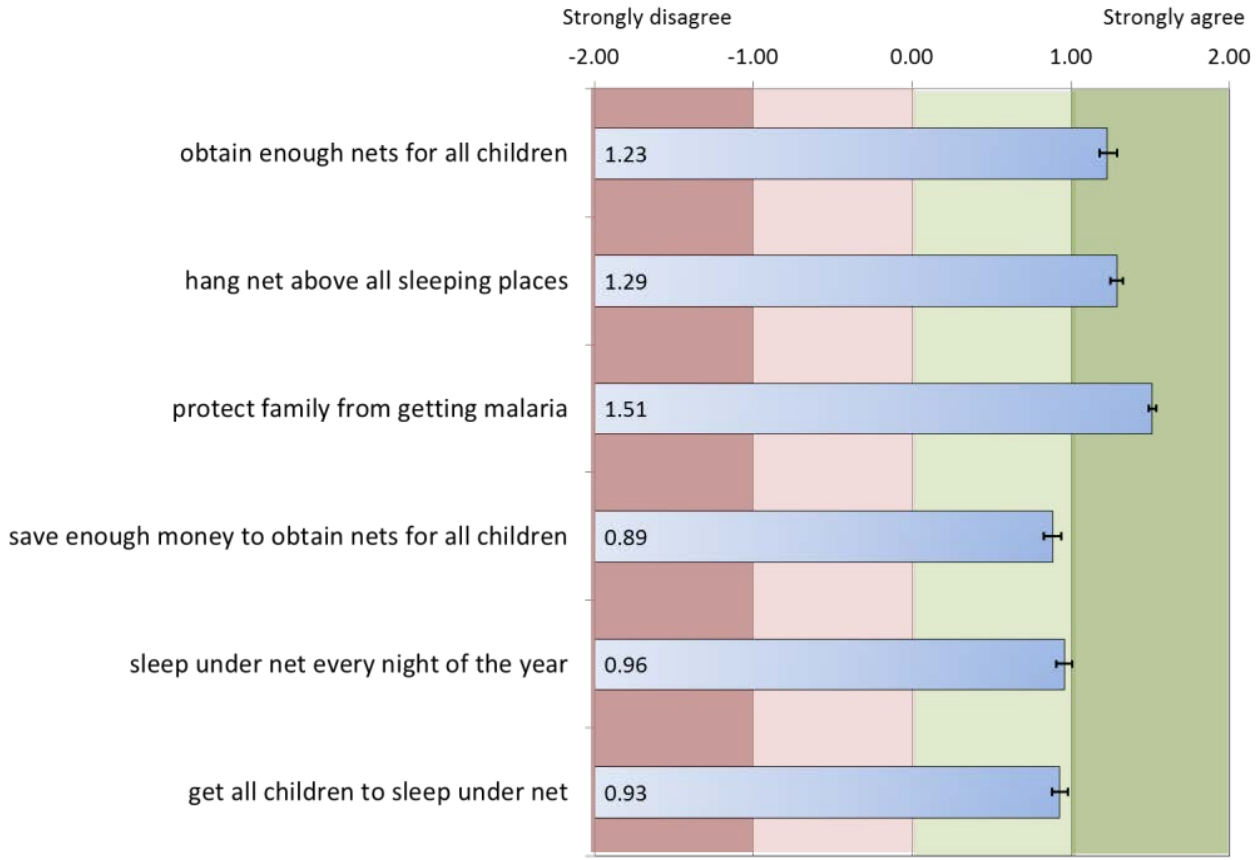
- Increase of effects with time since campaign differed by information channel
- Who was reached by each channel differed (profile)



- **Campaign** (leaflet, team) up with time, wealth, year, South
- **Health worker** up with time, education of head of HH, larger HH with children, younger HH
- **Media** (radio, drama) up with wealth, education, female HH, radio
- **Mediators** (leaders, town announcer) up with time, less educated, older HH, North
- **Social networks** (family, friend) down with time, up with urban, wealth, younger and larger HH

Step 2: Link message recall with action mediators

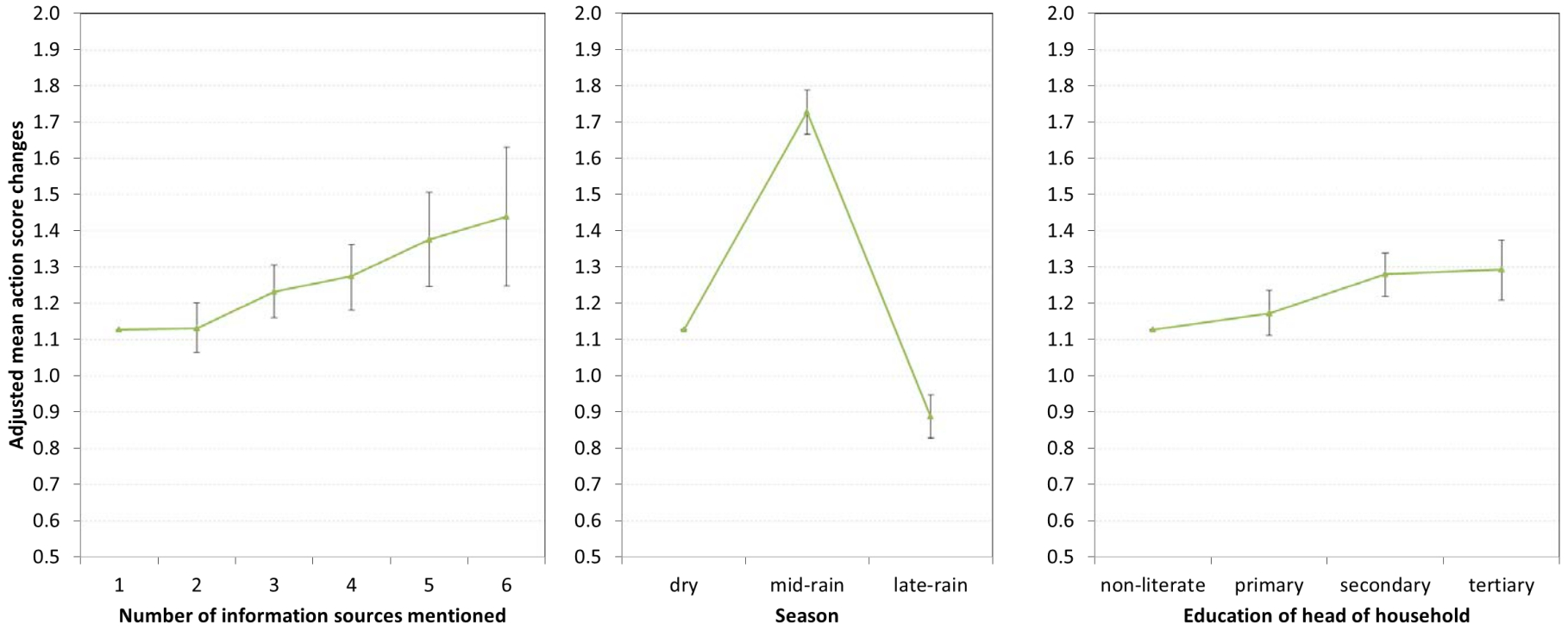
- Major outcome measure of exposure and recall of messages was “action score” as a measure of confidence to take action to prevent malaria in the family
- Categorized as: poor (<0); good (0–1.0); very good (1–1.5); excellent (1.5–2.0)



Step 2: Link message recall with action mediators

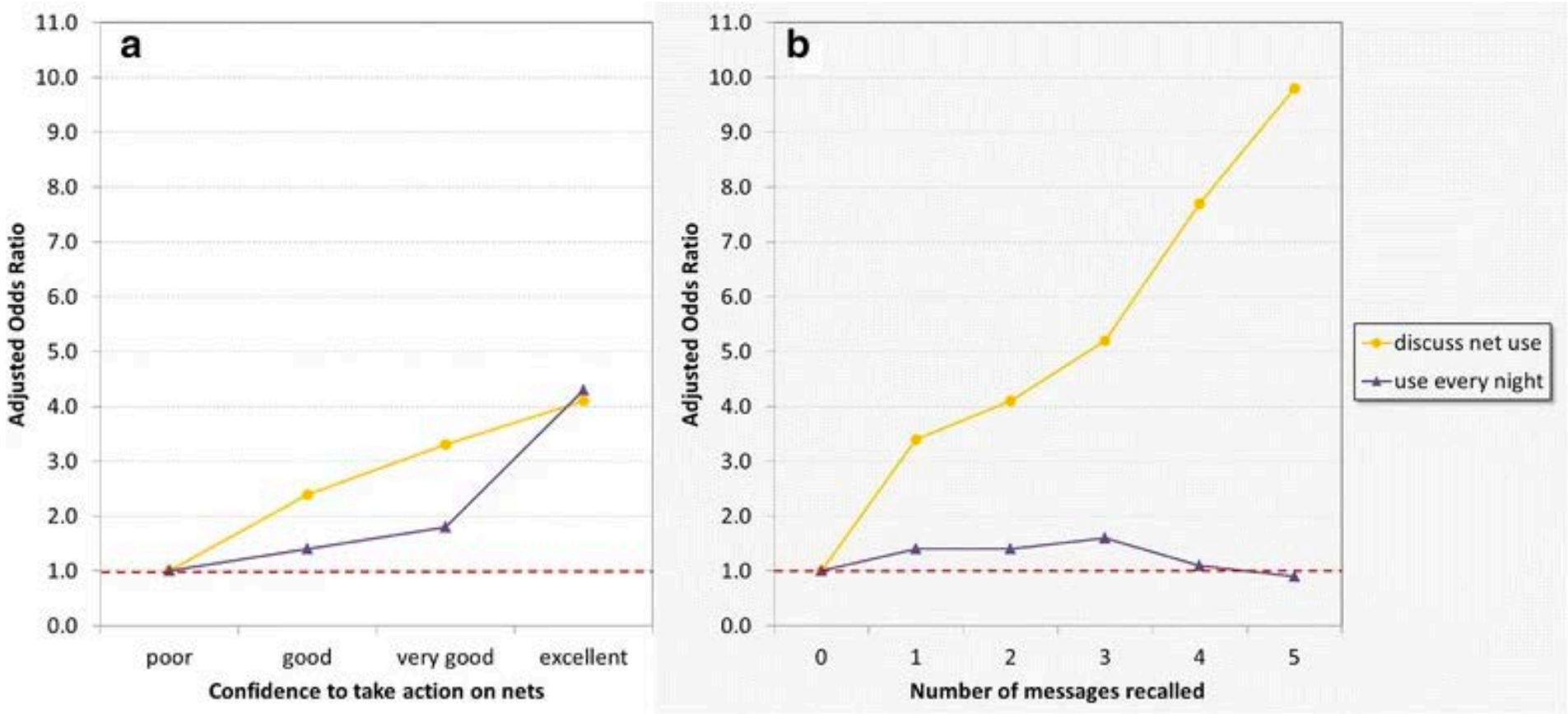
Confidence to take action - action score

- Number of messages recalled, rain and education of head of HH were the strongest positive determinants
- Other strong factors were: owning net, large family with children, North
- Weak positive effects: time since distribution, younger head HH
- No effect: wealth



Step 2: Link message recall with action mediators

Discuss net use and intention to use every night

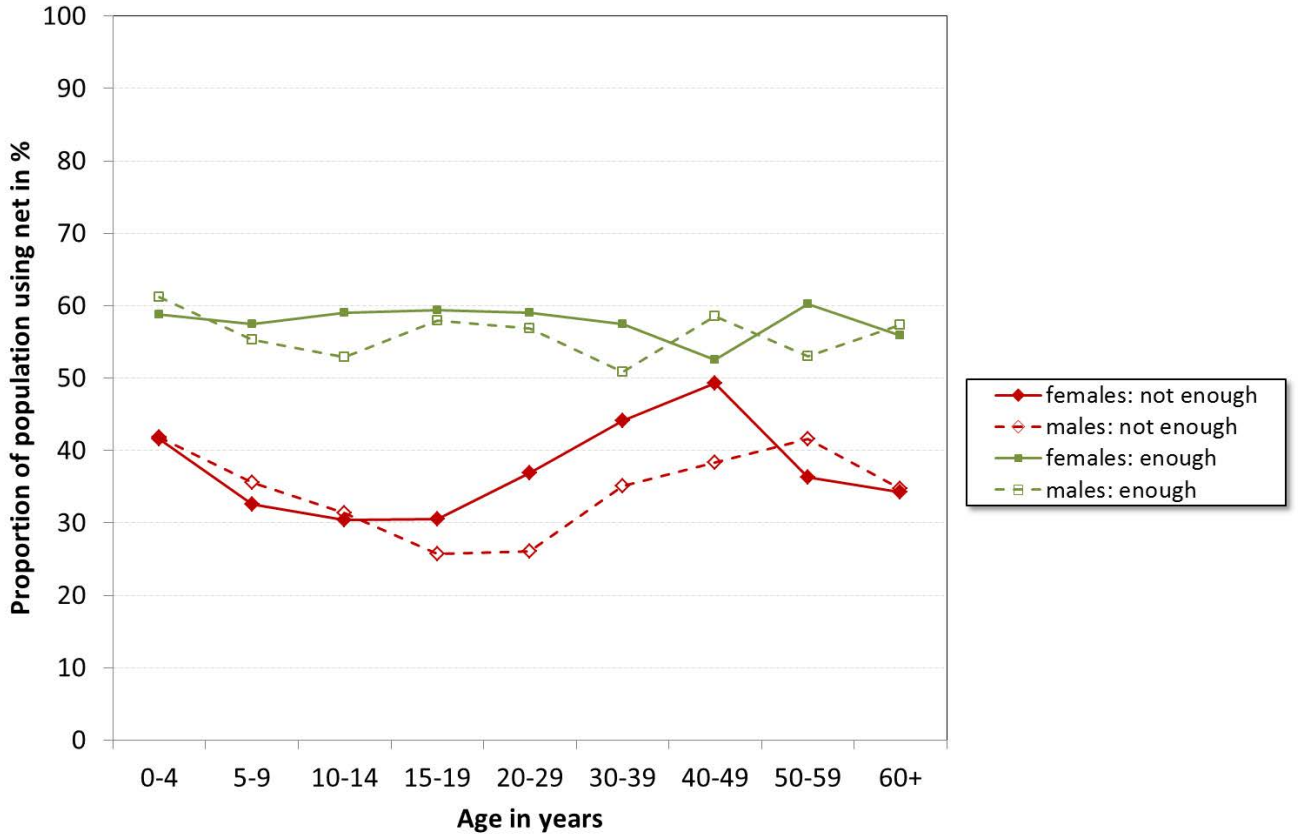


Effect of SBC message recall (**a**) and confidence to take action on nets (**b**) on SBC outcome

Step 3: Assess impact of SBC on ITN use

SBC outcome measures – net use by individuals

- ITN use was also higher if the household did not report difficulties hanging ITNs
- ITN use was significantly higher during the mid-rains or peak of rainy season
- ITN use was stronger overall and much more seasonal northern Nigeria



Step 3: Assess impact of SBC on ITN use

SBC impact adjusting for other determinants of ITN use and determinants of SBC exposure

BCC outcomes	Outcome: population net use			
	Uni-variable		Treatment effects model	
	Estimate	95% CI	Estimate	95% CI
Confidence to take action on nets				
Poor	22.9%	18.6, 27.9	27.4%	25.1, 29.7
Good	32.9%	29.8, 36.2	36.5%	35.2, 37.8
Very good	41.7%	38.8, 44.7	42.5%	41.5, 43.6
Excellent	49.7%	47.4, 52.0	44.9%	44.1, 45.6
Treatment effect (poor vs excellent)	**26.8%**		**17.4%**	**15.0, 19.0**
Intention to use net				
Use less than every night	32.2%	29.8, 34.6	35.1%	34.3, 35.9
Use every night	54.5%	52.3, 56.6	50.5%	49.5, 51.4
Treatment effect	**22.3%**		**15.4%**	**14.2, 16.6**
Discussing net use				
No discussion	30.6%	26.6, 34.9	34.7%	33.1, 36.3
Discuss	44.7%	42.7, 44.6	43.1%	43.0, 44.2
Treatment effect	**14.1%**		**8.4%**	**6.7, 10.1**

Programmatic implications

Strengths, weakness, validity, methodological challenges

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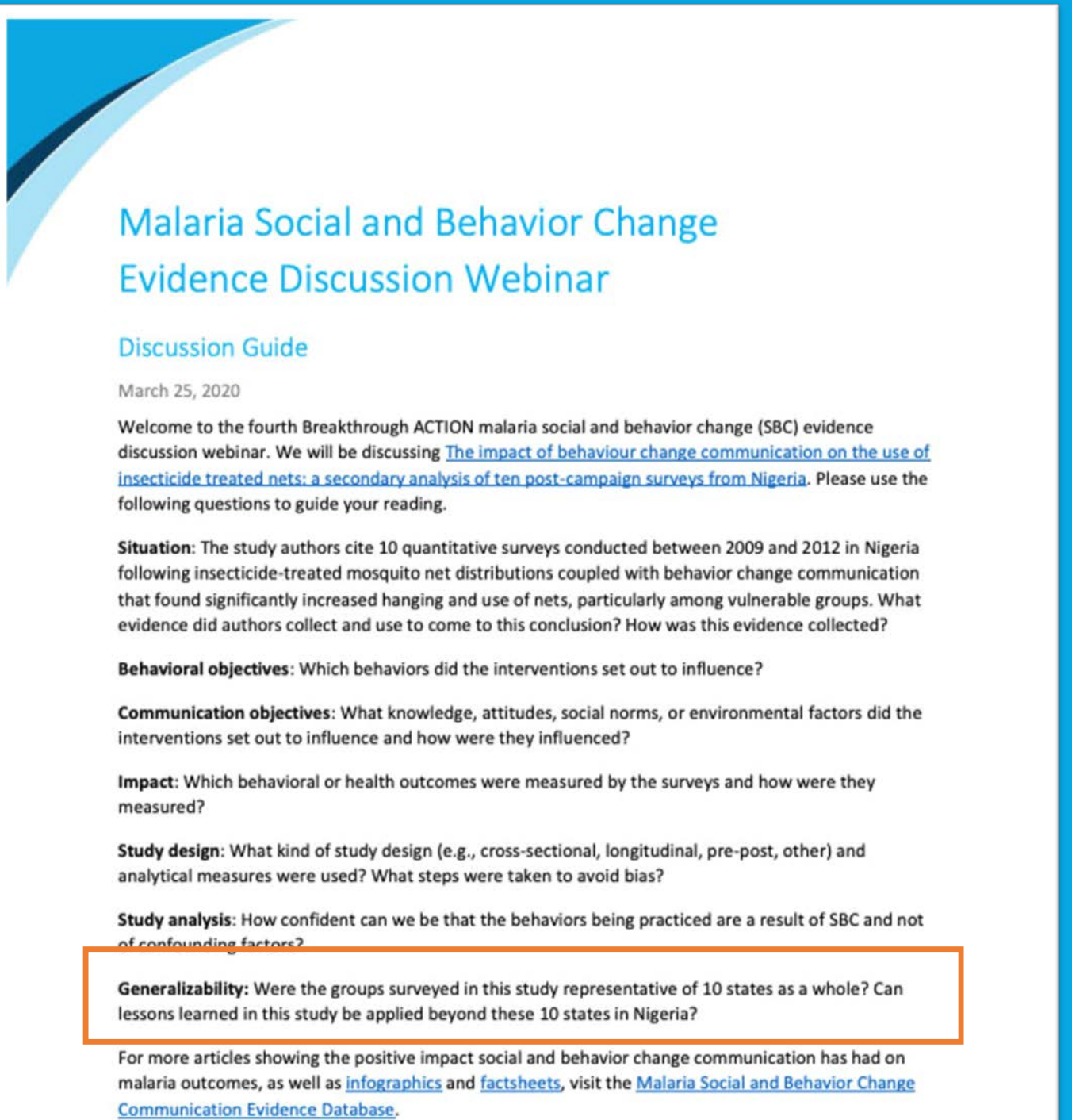

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Programmatic implications

- No single communication channel alone reached more than one-fourth to one-third of households: *multichannel, multi-media, mutually reinforcing communication is necessary to achieve the level of SBC exposure needed to change behavior*
- Exposure and message recall increased over time, with social interaction taking some time to gain momentum: *communication about ITN use should not be limited to campaign distributions, but should be continuous*

Strengths

- Pooling ten post-campaign data sets provides a large sample size
- The surveys were all population representative in design

Limitations

- Analysis relied exclusively on survey and household interview data and did not actively attempt to measure actual exposure to at least the media channels
- Household interview surveys depend on the quality of the interview responses, and are prone to recall bias and misclassification, and poor understanding of the questions by respondents

Lessons learned

- These post-campaign surveys were done in different places, in different times
- The ten surveys areas were chosen based on the need and implementation area of specific projects, making data representative at the state level but not of the country as a whole
- Ideally, assessment of the impact of specific interventions would have clearly defined control groups and data collected before and after the interventions

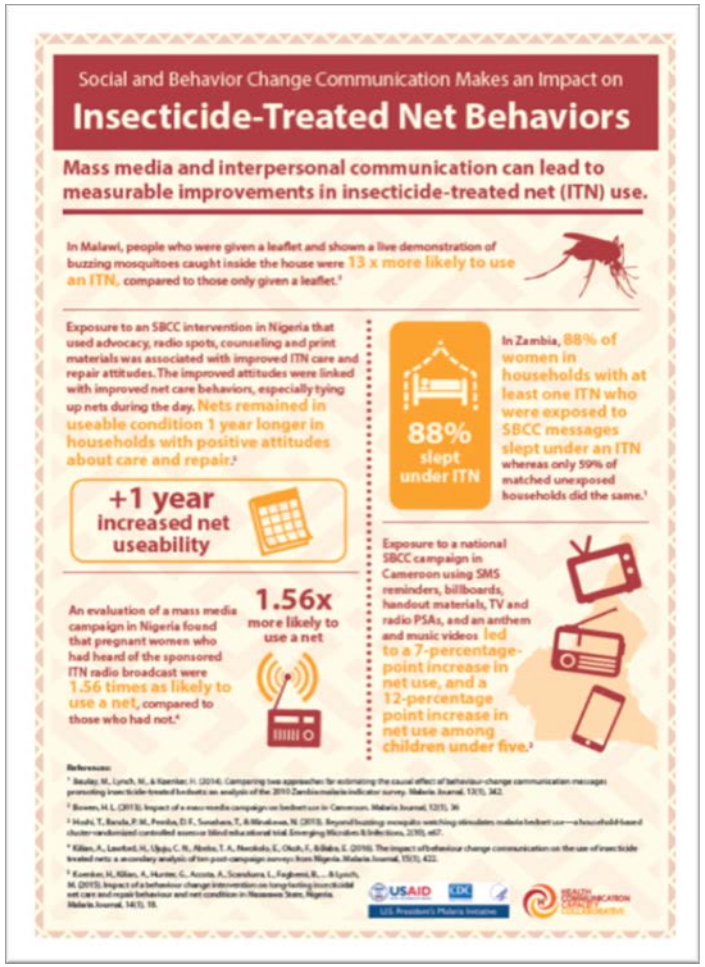
Lessons learned

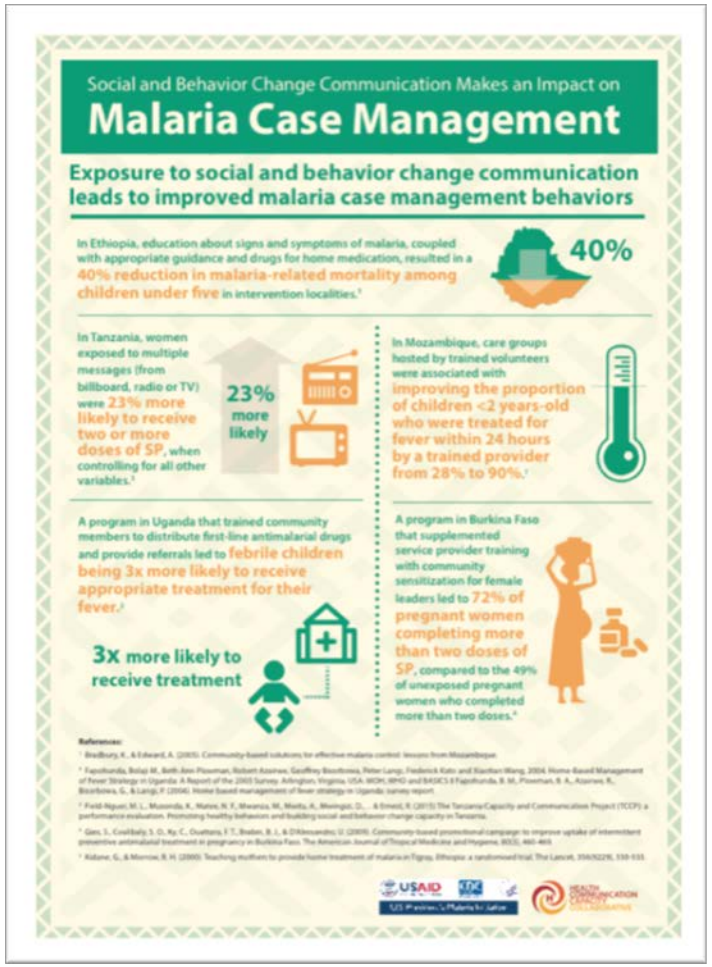
- Multi-channel SBC in Nigeria was very effective in contributing to increases in ITN hanging and use—particularly by vulnerable groups
- While there were many differences between zones (climate, culture, wealth, education), increasing confidence to take action to prevent malaria was universally associated with increases in ITN use

Discussion

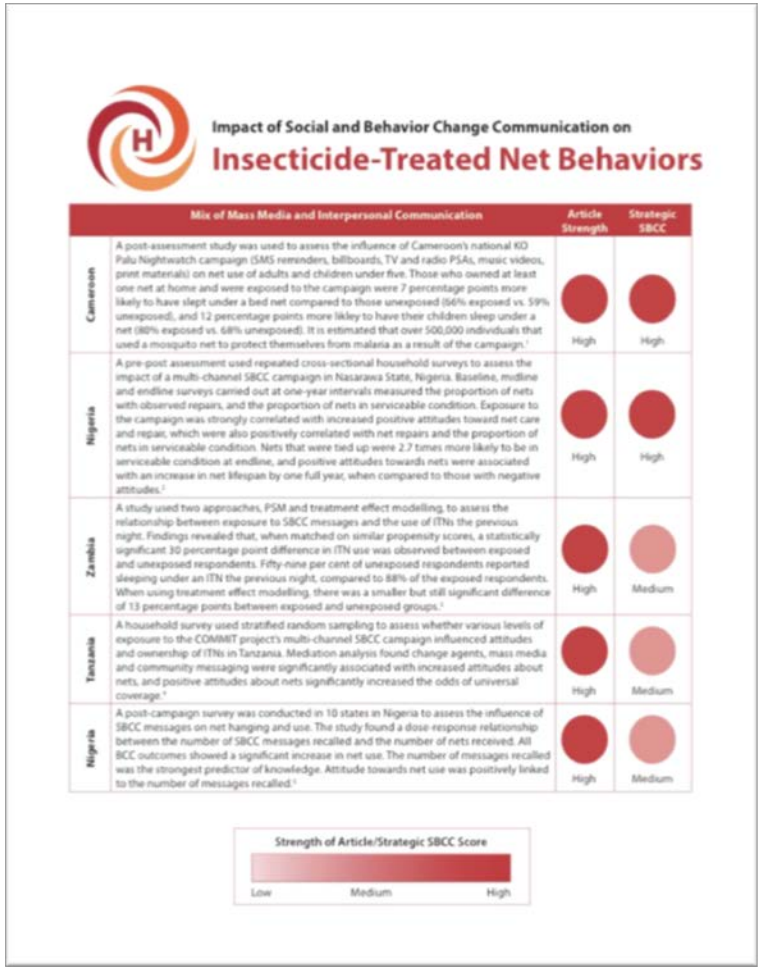
Q&A with participants
Please type your questions in the chat box

Malaria SBCC Evidence Database: Infographics





Malaria SBCC Evidence Database: Fact sheets



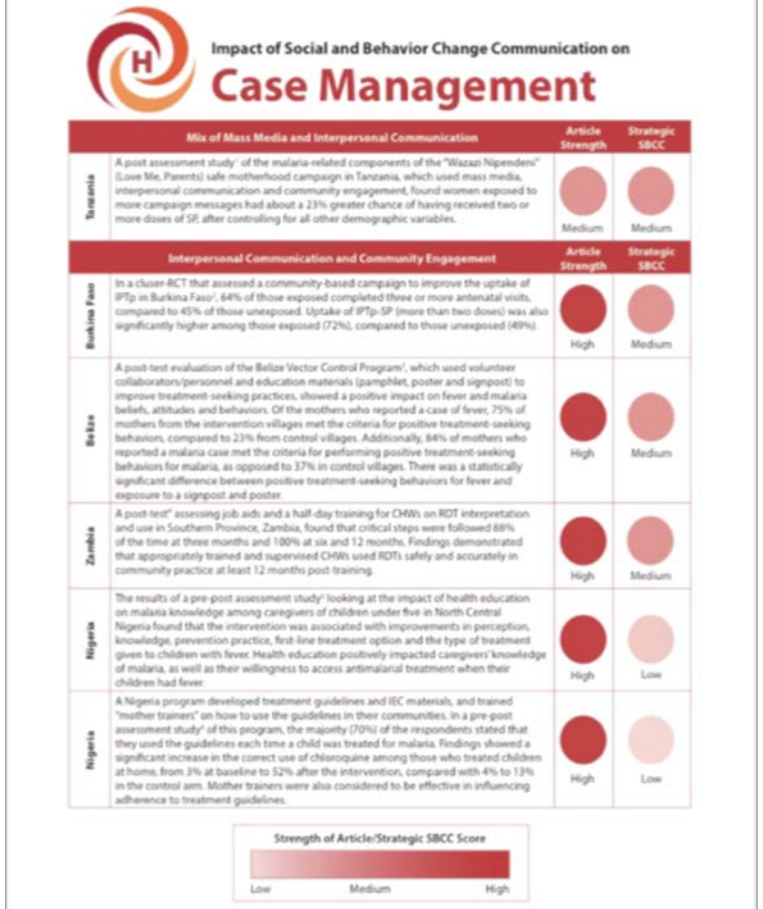
Impact of Social and Behavior Change Communication on

Insecticide-Treated Net Behaviors

	Mix of Mass Media and Interpersonal Communication	Article Strength	Strategic SBCC
Cameroon	A post-assessment study was used to assess the influence of Cameroon's national KO Palu Nightwatch campaign (SMS reminders, billboards, TV and radio PSAs, music videos, print materials) on net use of adults and children under five. Those who owned at least one net at home and were exposed to the campaign were 7 percentage points more likely to have slept under a bed net compared to those unexposed (56% exposed vs. 59% unexposed), and 12 percentage points more likely to have their children sleep under a net (80% exposed vs. 68% unexposed). It is estimated that over 500,000 individuals that used a mosquito net to protect themselves from malaria as a result of the campaign.[1]	High	High
Nigeria	A pre-post assessment used repeated cross-sectional household surveys to assess the impact of a multi-channel SBCC campaign in Nasarawa State, Nigeria. Baseline, midline and endline surveys carried out at one-year intervals measured the proportion of nets with observed repairs, and the proportion of nets in serviceable condition. Exposure to the campaign was strongly correlated with increased positive attitudes toward net care and repair, which were also positively correlated with net repairs and the proportion of nets in serviceable condition. Nets that were tied up were 2.7 times more likely to be in serviceable condition at endline, and positive attitudes towards nets were associated with an increase in net lifespan by one full year, when compared to those with negative attitudes.[2]	High	High
Zambia	A study used two approaches, PSM and treatment effect modelling, to assess the relationship between exposure to SBCC messages and the use of ITNs the previous night. Findings revealed that, when matched on similar propensity scores, a statistically significant 30 percentage point difference in ITN use was observed between exposed and unexposed respondents. Fifty-nine per cent of unexposed respondents reported sleeping under an ITN the previous night, compared to 88% of the exposed respondents. When using treatment effect modelling, there was a smaller but still significant difference of 13 percentage points between exposed and unexposed groups.[3]	High	Medium
Tanzania	A household survey used stratified random sampling to assess whether various levels of exposure to the COMMIT project's multi-channel SBCC campaign influenced attitudes and ownership of ITNs in Tanzania. Mediation analysis found change agents, mass media and community messaging were significantly associated with increased attitudes about nets, and positive attitudes about nets significantly increased the odds of universal coverage.[4]	High	Medium
Nigeria	A post-campaign survey was conducted in 10 states in Nigeria to assess the influence of SBCC messages on net hanging and use. The study found a dose-response relationship between the number of SBCC messages recalled and the number of nets received. All BCC outcomes showed a significant increase in net use. The number of messages recalled was the strongest predictor of knowledge. Attitude towards net use was positively linked to the number of messages recalled.[5]	High	Medium

Strength of Article/Strategic SBCC Score

Low — Medium — High



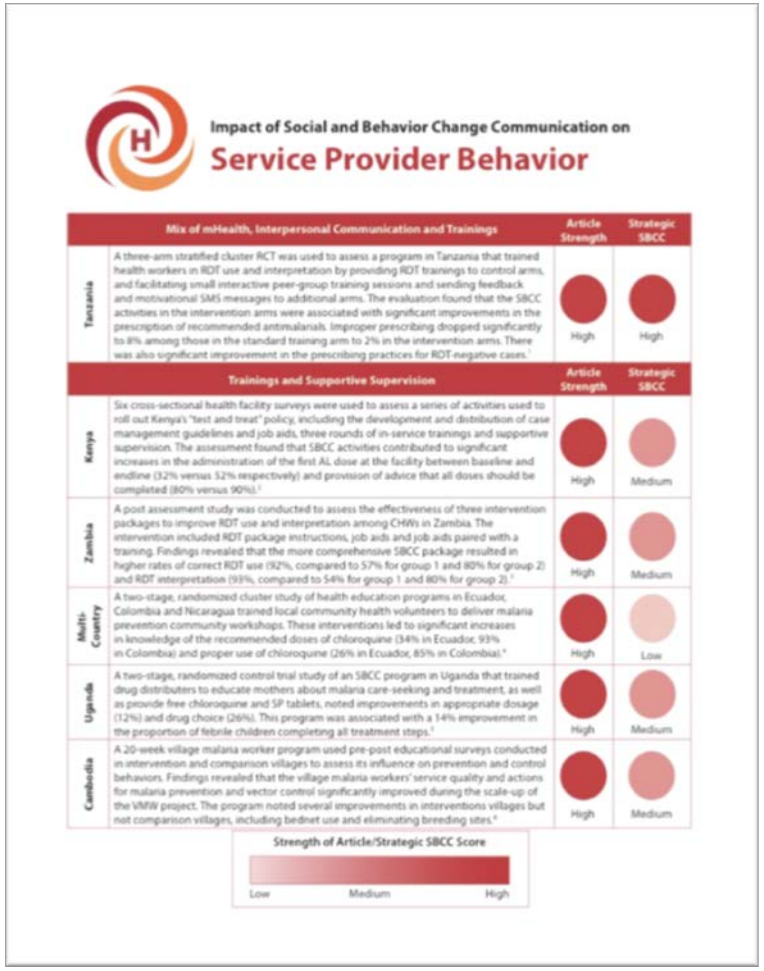
Impact of Social and Behavior Change Communication on

Case Management

	Mix of Mass Media and Interpersonal Communication	Article Strength	Strategic SBCC
Tanzania	A post assessment study[1] of the malaria-related components of the "Wazazi Nipendeni" (Love Me, Parents) safe motherhood campaign in Tanzania, which used mass media, interpersonal communication and community engagement, found women exposed to more campaign messages had about a 23% greater chance of having received two or more doses of SP, after controlling for all other demographic variables.	Medium	Medium
	Interpersonal Communication and Community Engagement	**Article Strength**	**Strategic SBCC**
Burkina Faso	In a cluser-RCT that assessed a community-based campaign to improve the uptake of IPTp in Burkina Faso[2], 64% of those exposed completed three or more antenatal visits, compared to 45% of those unexposed. Uptake of IPTp-SP (more than two doses) was also significantly higher among those exposed (72%), compared to those unexposed (49%).	High	Medium
Belize	A post-test evaluation of the Belize Vector Control Program[3], which used volunteer collaborators/personnel and education materials (pamphlet, poster and signpost) to improve treatment-seeking practices, showed a positive impact on fever and malaria beliefs, attitudes and behaviors. Of the mothers who reported a case of fever, 75% of mothers from the intervention villages met the criteria for positive treatment-seeking behaviors, compared to 23% from control villages. Additionally, 84% of mothers who reported a malaria case met the criteria for performing positive treatment-seeking behaviors for malaria, as opposed to 37% in control villages. There was a statistically significant difference between positive treatment-seeking behaviors for fever and exposure to a signpost and poster.	High	Medium
Zambia	A post-test[4] assessing job aids and a half-day training for CHWs on RDT interpretation and use in Southern Province, Zambia, found that critical steps were followed 88% of the time at three months and 100% at six and 12 months. Findings demonstrated that appropriately trained and supervised CHWs used RDTs safely and accurately in community practice at least 12 months post-training.	High	Medium
Nigeria	The results of a pre-post assessment study[5] looking at the impact of health education on malaria knowledge among caregivers of children under five in North Central Nigeria found that the intervention was associated with improvements in perception, knowledge, prevention practice, first-line treatment option and the type of treatment given to children with fever. Health education positively impacted caregivers' knowledge of malaria, as well as their willingness to access antimalarial treatment when their children had fever.	High	Low
Nigeria	A Nigeria program developed treatment guidelines and IEC materials, and trained "mother trainers" on how to use the guidelines in their communities. In a pre-post assessment study[6] of this program, the majority (70%) of the respondents stated that they used the guidelines each time a child was treated for malaria. Findings showed a significant increase in the correct use of chloroquine among those who treated children at home, from 3% at baseline to 52% after the intervention, compared with 4% to 13% in the control arm. Mother trainers were also considered to be effective in influencing adherence to treatment guidelines.	High	Low

Strength of Article/Strategic SBCC Score

Low — Medium — High



Impact of Social and Behavior Change Communication on

Service Provider Behavior

	Mix of mHealth, Interpersonal Communication and Trainings	Article Strength	Strategic SBCC
Tanzania	A three-arm stratified cluster RCT was used to assess a program in Tanzania that trained health workers in RDT use and interpretation by providing RDT trainings to control arms, and facilitating small interactive peer-group training sessions and sending feedback and motivational SMS messages to additional arms. The evaluation found that the SBCC activities in the intervention arms were associated with significant improvements in the prescription of recommended antimalarials. Improper prescribing dropped significantly to 8% among those in the standard training arm to 2% in the intervention arms. There was also significant improvement in the prescribing practices for RDT-negative cases.[1]	High	High
	Trainings and Supportive Supervision	**Article Strength**	**Strategic SBCC**
Kenya	Six cross-sectional health facility surveys were used to assess a series of activities used to roll out Kenya's "test and treat" policy, including the development and distribution of case management guidelines and job aids, three rounds of in-service trainings and supportive supervision. The assessment found that SBCC activities contributed to significant increases in the administration of the first AL dose at the facility between baseline and endline (32% versus 52% respectively) and provision of advice that all doses should be completed (80% versus 90%).[2]	High	Medium
Zambia	A post assessment study was conducted to assess the effectiveness of three intervention packages to improve RDT use and interpretation among CHWs in Zambia. The intervention included RDT package instructions, job aids and job aids paired with a training. Findings revealed that the more comprehensive SBCC package resulted in higher rates of correct RDT use (92%, compared to 57% for group 1 and 80% for group 2) and RDT interpretation (93%, compared to 54% for group 1 and 80% for group 2).[3]	High	Medium
Multi-Country	A two-stage, randomized cluster study of health education programs in Ecuador, Colombia and Nicaragua trained local community health volunteers to deliver malaria prevention community workshops. These interventions led to significant increases in knowledge of the recommended doses of chloroquine (34% in Ecuador, 93% in Colombia) and proper use of chloroquine (26% in Ecuador, 85% in Colombia).[4]	High	Low
Uganda	A two-stage, randomized control trial study of an SBCC program in Uganda that trained drug distributers to educate mothers about malaria care-seeking and treatment, as well as provide free chloroquine and SP tablets, noted improvements in appropriate dosage (12%) and drug choice (26%). This program was associated with a 14% improvement in the proportion of febrile children completing all treatment steps.[5]	High	Medium
Cambodia	A 20-week village malaria worker program used pre-post educational surveys conducted in intervention and comparison villages to assess its influence on prevention and control behaviors. Findings revealed that the village malaria workers' service quality and actions for malaria prevention and vector control significantly improved during the scale-up of the VMW project. The program noted several improvements in interventions villages but not comparison villages, including bednet use and eliminating breeding sites.[6]	High	Medium

Strength of Article/Strategic SBCC Score

Low — Medium — High

Thank you!

- Questions, comments, follow-up:
  - Albert Kilian: albert@trophealth.com
  - Mike Toso: miketoso@jhu.edu
- We will send an email with today's slides and the discussion recording shortly
- Please complete the short post-webinar survey that will appear in your browser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