

Insights for improving malaria, family planning, and maternal and child health outcomes in northwestern Nigeria through social and behavior change research

Malaria

This brief provides rigorous evidence-based insights to implementers and researchers of social and behavior change (SBC) programs that seek to improve community knowledge, attitudes, norms, and behaviors for improved health of women and their young children. The brief focuses on key malaria prevention and treatment behaviors, and uncovers the barriers and facilitators to the practice of these positive health behaviors in northwestern Nigeria. It is one of a series that present findings from a Breakthrough RESEARCH study that uniquely captures data on a wide range of psychosocial drivers of behavioral outcomes in the areas of family planning, malaria, and maternal, newborn, and child health, and nutrition (MNCH+N). The results presented in this series will inform the improvement of women and children's health in Nigeria and help to achieve the objectives of the National Strategic Health Development Plan II (2018–2022), as well as support global efforts to achieve the United Nations Sustainable Development Goals.

Breakthrough RESEARCH and ACTION in Nigeria

Breakthrough RESEARCH and Breakthrough ACTION are USAID's flagship SBC programs. Breakthrough ACTION in Nigeria implements SBC programming in eleven states and the Federal Capital Territory (FCT) by targeting key psychosocial factors at multiple socioecological levels (e.g., individual, community, society) in order to improve health behaviors in the areas of malaria, family planning, and MNCH+N. Breakthrough RESEARCH in Nigeria conducts rigorous research to inform SBC program implementation in three of these program states (Kebbi, Sokoto, and Zamfara). Findings presented here are from a Breakthrough RESEARCH baseline study that will be used to inform SBC program adaptation and scale-up.

KEY POINTS

About 7 of 10 (71%) households owned at least one long-lasting insecticidal net (LLIN), although only 22% owned at least one LLIN for every two household members. Increasing LLIN access within households continues to be a priority for malaria control programs in Nigeria. LLIN use by pregnant and young children was very high in households with LLIN access.

Uptake of intermittent preventive treatment (IPTp) for malaria during pregnancy is contingent on ANC attendance. SBC programs may need to emphasize pregnancy-related ideations (e.g., ANC knowledge and benefits) in order to raise ANC attendance and IPTp use rates together, in addition to messaging about malaria risks during pregnancy.

Formal care-seeking and diagnostic testing of pediatric fevers was low. Among women who sought care for a febrile child, provider trust, facility distance, and perceived effectiveness of treatments were the main reasons for choosing the treatment location.

Positive perceptions of health services were related to formal care-seeking and malaria test uptake as well as respondents' trust in negative test results, underscoring the importance of perceived and actual health services quality to raise service usage rates and to shape beliefs about the efficacy of malaria diagnostic tests.

Self-efficacy for spousal communication and malaria knowledge also influenced malaria test use for pediatric fevers and trust in negative results. SBC programs should consider focusing on dispelling myths that most pediatric fevers are due to malaria to improve trust in negative results.

Setting the context

Malaria is among the leading causes of child mortality globally and in Nigeria.¹ Cornerstones of malaria prevention and treatment programs in Nigeria include the use of LLIN, IPTp, as well as timely and appropriate diagnosis and treatment of malaria symptoms.^{2,3} According to the 2018 Nigeria Demographic and Health Survey, when households owned at least one LLIN for every two people, there was high LLIN use by pregnant women and young children.⁴




Several studies suggest potential barriers to IPTp use during pregnancy including lack of awareness about risks of malaria during pregnancy, low rates of ANC attendance, and the fact that IPTp was not offered by the health provider.⁵ For pediatric fever management, low rates of formal care-seeking and appropriate treatment may be related to cost of services, facility distance, poor awareness about common childhood illnesses, or other sociocultural or gender dynamics.⁶⁻⁹

Decision-making processes are multifaceted and influenced by the complex interaction of knowledge, beliefs, social norms, and other psychosocial factors that are posited by theories as intermediate determinants of behavior change.^{10,11} We employed a set of ideational metrics for malaria based on previous research from northwestern Nigeria and theory-based design.⁷ This research brief aims to describe different barriers to the uptake of malaria prevention and treatment behaviors and to quantify the importance of ideational factors on key behavioral outcomes.

Study methods

Results are based on the behavioral sentinel surveillance (BSS) baseline survey that was conducted between September and October 2019 in Breakthrough ACTION program areas in Kebbi, Sokoto, and Zamfara. Figure 1 summarizes the study methods.

FIGURE 1 BSS BASELINE SURVEY STUDY METHODS

 <p>Study population</p>	<p>Pregnant women and women with under-2s living within Breakthrough ACTION program areas in Kebbi, Sokoto and Zamfara states (not representative at state level)</p>
 <p>Study design</p>	<p>Cross-sectional and cohort components</p>
 <p>Sample size</p>	<p>3,032 pregnant women 3,043 women with a child under 2 years</p>

Key results

Malaria prevention

When sufficient LLINs are available in the home, there is high use by pregnant women and young children. But, most households lack a sufficient supply.

- About 7 out of 10 (71%) households owned at least one LLIN, although only 22% had at least one net for every two household members. Households in southwestern Kebbi had particularly low availability of sufficient LLINs for effective coverage (Figure 2).
- Among under-tuos and pregnant women living in households with at least one LLIN for every two people, 94% and 83%, respectively, slept under an LLIN the previous night. Pregnant women who did not sleep under an LLIN despite having LLIN access, were more likely to be older (26% for 35–49 years old vs. 15% for 15–24 years old), live in larger households (17% in 6+ members vs. 14% in <3-members), or reside in Sokoto (24% in Sokoto vs. 13% in Kebbi vs. 12% in Zamfara).

Programmatic implications

- ✓ Only one-quarter of households had at least one LLIN for every two household members making increasing LLIN access a continued priority.
- ✓ Malaria risk perceptions among older women with previous pregnancies may be low. SBC programs should emphasize the malaria risks in every pregnancy and increased risk with subsequent pregnancies.
- ✓ Research could further help elucidate specific barriers to LLIN use by pregnant women in southwestern Kebbi, as well as how the number of sleeping areas available to hang nets affect LLIN use.



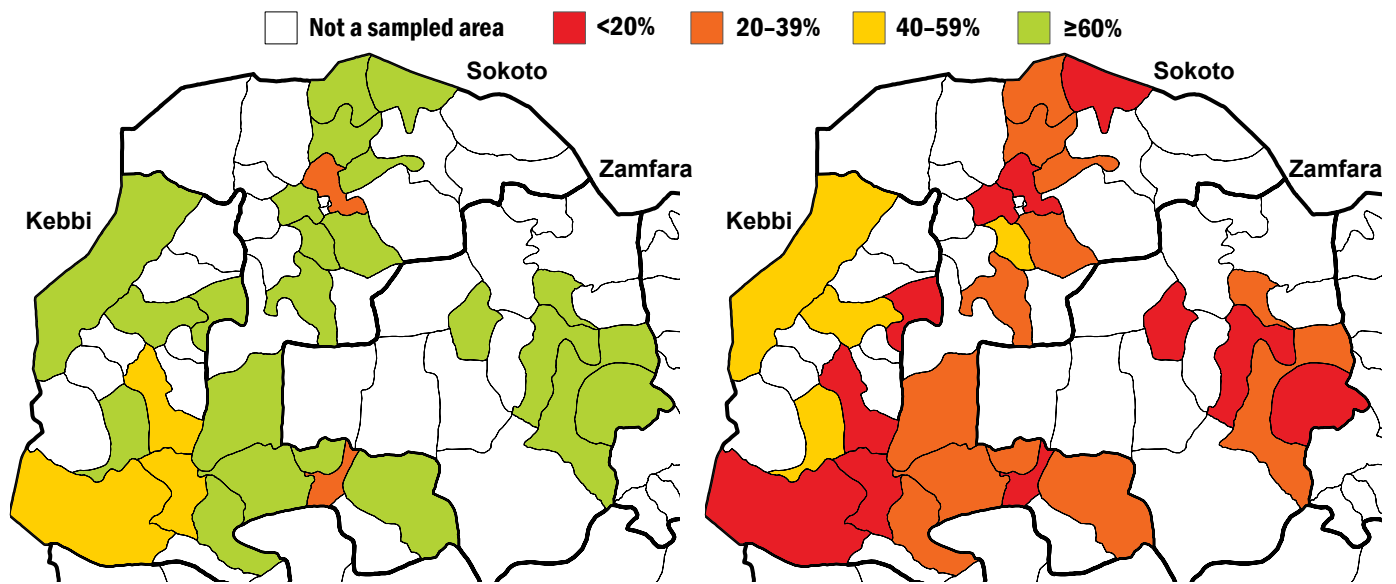
 <p>Sampling method</p>	<p>108 wards across 3 states Census of pregnant women Random selection of women with a child under 2 years</p>
 <p>Data analysis</p>	<p>Mixed-effects logistic regression models were used to derive predicted probabilities for malaria outcomes, controlling for malaria-related ideations and sociodemographic characteristics, including household wealth, age, education (woman and spouse), and employment (woman and spouse).</p>

FIGURE 2 WHILE MOST HOUSEHOLDS OWN AT LEAST ONE LLIN, FAR FEWER OWNED AT LEAST ONE LLIN FOR EVERY TWO HOUSEHOLD MEMBERS

Percentage of households with at least 1 LLIN (figure A); and with at least 1 LLIN for every 2 household members (figure B)



Malaria in pregnancy

IPTp uptake is closely linked to ANC attendance and pregnancy-related ideations, rather than specific malaria knowledge or beliefs

- Only 19% of women 15–49 years received IPTp during their last pregnancy (defined as 3+ doses of SP/Fansidar), with greater uptake among more educated women and those living in wealthier households. Among women who did not receive IPTp in their last pregnancy, the most commonly cited reasons were respondent opposition (28%) and spousal opposition (22%).
- Respondents who knew women should have at least four ANC visits during pregnancy, who knew women should attend their first ANC visit during the first trimester or as soon as they think they are pregnant, who knew IPTp is a benefit of ANC attendance, and who knew that a child being born too early is a potential risk of malaria in pregnancy were approximately 1.2 times more likely to receive IPTp than those who did not.
- Respondents who believed pregnant women who attend ANC 4+ times have safer pregnancies were 1.3 times more likely to have received IPTp during their last pregnancy, while those who thought only sick pregnant women needed ANC were 23% less likely to have received IPTp during their last pregnancy. Women with a stated intent to use IPTp during their next pregnancy were 6.7 times more likely to have received IPTp in their last pregnancy than those without that intent.

Programmatic implications

- ✓ SBC programs working to prevent malaria in pregnancy may need to emphasize pregnancy-related ideations (e.g., ANC knowledge, benefits) to raise IPTp rates in addition to raising awareness about malaria risks during pregnancy.
- ✓ SBC programs could consider exploring provider behavior change initiatives to improve the delivery of IPTp and other essential ANC content to pregnant women, while working closely with health system strengthening efforts in general.
- ✓ SBC programs may also need to raise awareness about IPTp as a critical intervention even for healthy pregnancies in order to improve women’s demand for such services during ANC visits.
- ✓ Spousal and respondent opposition to IPTp were commonly reported barriers to uptake. More research is needed to better understand the nature of this opposition in order to inform SBC programming.

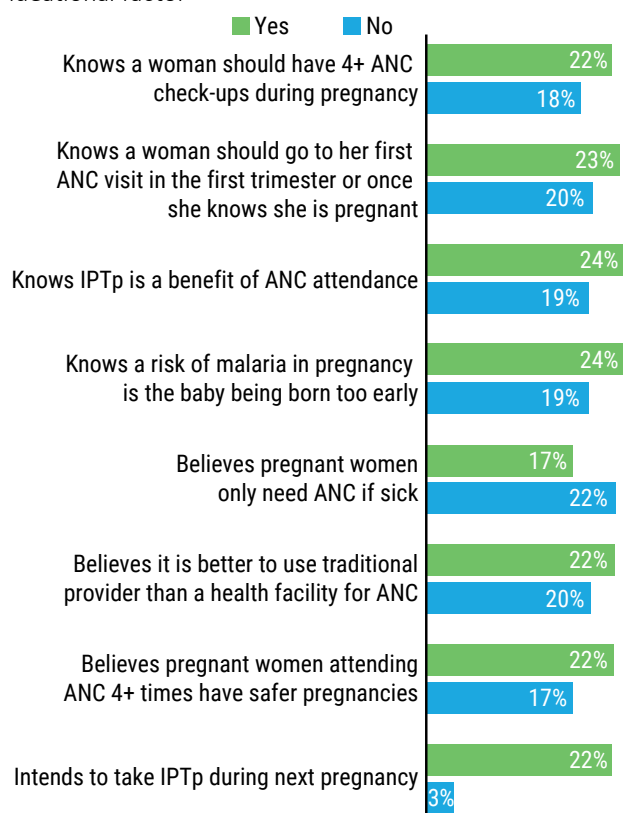
TABLE 1 SPOUSAL AND RESPONDENT OPPOSITION ARE KEY BARRIERS TO IPTp UPTAKE

Percentage of women 15–49 years with a child under 2 years who did not take medications to prevent malaria during her last pregnancy who cited reasons for non-use

REASON	%
Not sick/feel healthy	50.9
Respondent opposes	27.7
Husband/partner opposes	22.2
None available	8.5
Provider did not offer	8.5
Did not go to ANC/HF	7.7
Too costly	5.8
Not necessary	4.0
Afraid of side effects/health concerns	3.9
Facility closed/provider not available	0.7
Religious/community leader opposes	0.7
Not customary	0.4
Up to god	0.2

FIGURE 3 IPTp UPTAKE IS CLOSELY LINKED WITH ANC ATTENDANCE AND PREGNANCY-RELATED IDEATIONS

Predicted probabilities* of IPTp uptake during the last pregnancy of women 15–49 with a child under 2 years, by ideational factor



*Predicted probabilities of IPTp uptake were derived from mixed-effects logistic regression models adjusted for child health-related ideations (Table 1) and socioeconomic characteristics including household wealth, woman's age, ANC attendance at least 4 times, education (woman and spouse), employment (woman and spouse), child's age, sex. All ideational metrics presented are significant at the <0.05 level.

Malaria case management

There are low rates of formal care-seeking and malaria test uptake for febrile children

- Only 39% of children under two years of age with fever in the past two weeks were taken for formal medical care^a, while 44% were taken to a pharmacy/chemist. Even fewer febrile children (22%) were tested for malaria.
- Among respondents who did not seek care for their febrile child, the most commonly cited reasons were healthcare costs, fatalistic attitudes (“Up to God”), perceptions of non-severe symptoms, or decision to provide care at home.
- The top reasons for choosing the treatment location were provider trust, distance, and perceived effectiveness of treatments. Distance, low cost, and short wait time were more often cited by women taking the febrile child to a pharmacy/chemist compared to those attending government hospitals or PHC facilities, who instead more often reported provider trust, perceived effectiveness of treatments, and respectful care.

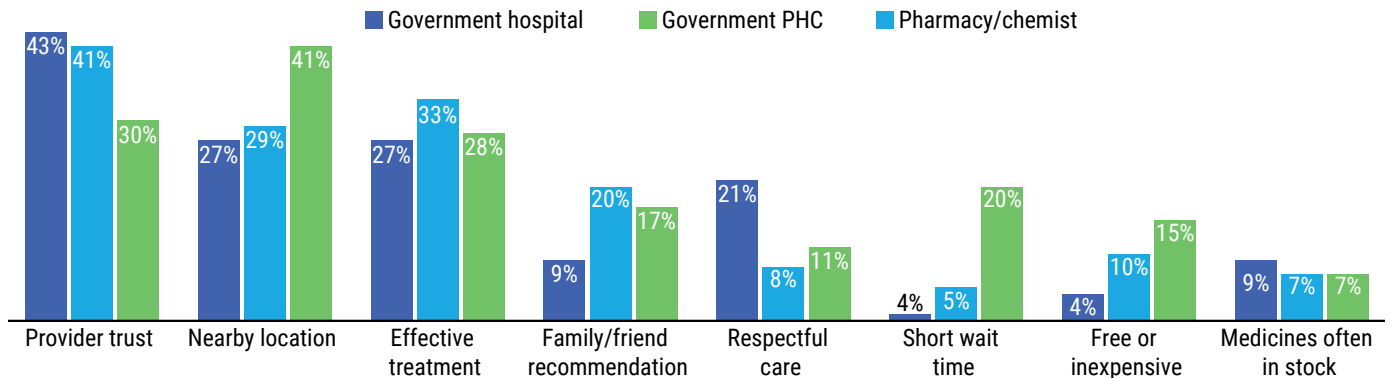
Health services perceptions, malaria beliefs, and self-efficacy for spousal communication are critical for seeking formal care and malaria testing

- Women who believed health facilities often have medicines needed for sick children were 1.3 and 1.6 times more likely to seek care from a formal medical source and to test a febrile child for malaria than those who did not.
- Mothers who believed a health worker is the best person to talk to for a sick child were 1.9 times more likely to seek formal medical care than those who did not.
- Women who believed a blood test is the only way to know if a person has malaria were 2.4 times more likely to have their febrile child tested for malaria than those who did not.
- Women who felt confident to convince their husbands to seek care for a sick child were 3.6 times more likely to have their febrile child tested than those who felt uncertain.

^aFormal medical source refers to government hospital, government primary health center (PHC), dispensary/health post, community health outreach post nursing/maternity home, or private hospital/clinic.

FIGURE 4 DIFFERENT REASONS DRIVE THE CHOICE OF GOVERNMENT HOSPITAL, PHC, OR PHARMACY TO TREAT FEBRILE CHILDREN

Among women 15–49 years with a child under 2 years who sought any care for her youngest child with fever in the past 2 weeks, percentage who cited certain reasons for choosing the treatment location, by source of care visited



Programmatic implications

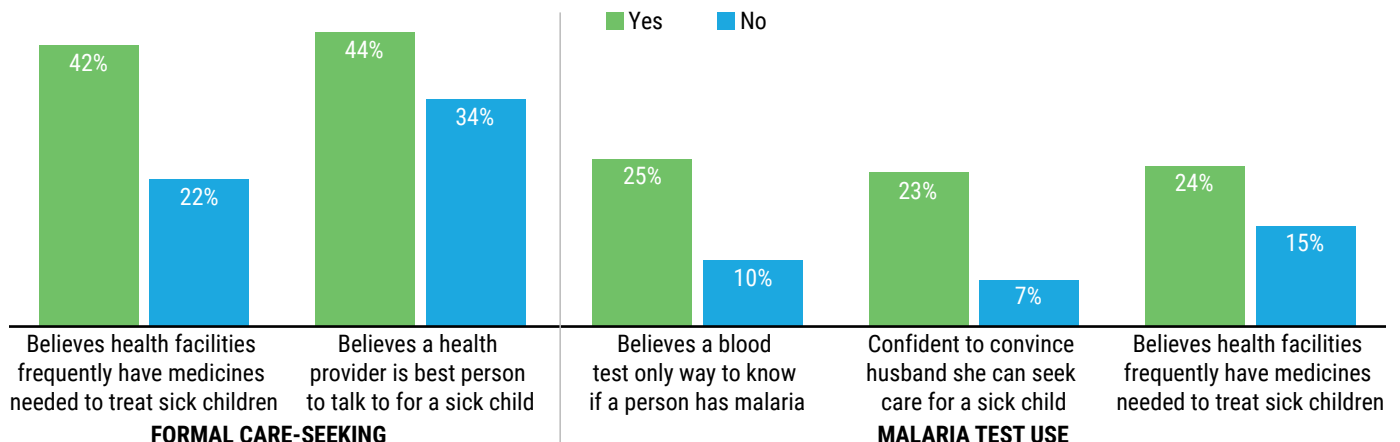
- ✓ Improving perceived and actual health services quality in these communities is critical for raising formal care-seeking and appropriate treatment rates for febrile children. This will require multisectoral efforts with SBC programs working alongside health system strengthening efforts.
- ✓ Women’s confidence in convincing her husband to seek care for sick children is also important, and programs may need to think about ways to support women’s empowerment to decide on how to care for sick children.

Trust in malaria test results is associated with positive views of health services and certain malaria beliefs

- Women who believed a health provider is the best person to talk to for a sick child or who believed the health facility has medicines needed to treat a sick child were 1.2 and 1.1 times more likely to believe blood tests are the only way to know if a person has malaria.
- Women who said health workers influenced their decision to seek care for their sick child were 14% less likely to distrust negative malaria test results or say they still worry it could be malaria even if the test result is negative.
- Women who knew mosquitoes cause malaria were 1.1 times more likely to believe that blood tests are the only way to know if a person has malaria.

FIGURE 6 HEALTH SERVICES PERCEPTIONS, MALARIA BELIEFS AND SELF-EFFICACY ARE CRITICAL FOR FORMAL CARE-SEEKING AND MALARIA TEST USE

Predicted probabilities* of seeking care from a formal medical source, or to have a child tested for malaria for children under two years with fever, by ideational factor



*Predicted probabilities of formal care-seeking and malaria test use for febrile children were derived from mixed-effects logistic regression models adjusted for child health-related ideations (Table 1) and socioeconomic characteristics including household wealth, woman’s age, ANC attendance at least 4 times, education (woman and spouse), employment (woman and spouse), child’s age, sex. All ideational metrics presented are significant at the <0.05 level.

- Women who believed that fever is almost always caused by malaria were 1.4 times more likely to distrust negative malaria test results, or say they still worry it could be malaria even if the test result is negative.

Programmatic implications

- ✓ Positive views of health services in general are associated with positive beliefs about blood tests and trust in negative results, which underscores the need to improve health services to not only expand access to malaria tests but to also potentially help shape positive beliefs about this common diagnostic tool.
- ✓ While few women cited health workers as influencing their decision to seek care for a sick child, their support was influential in promoting trust in negative malaria test results. This again emphasizes the link between trust in health services and its diagnostic services, although reverse causation may affect results.

Conclusions

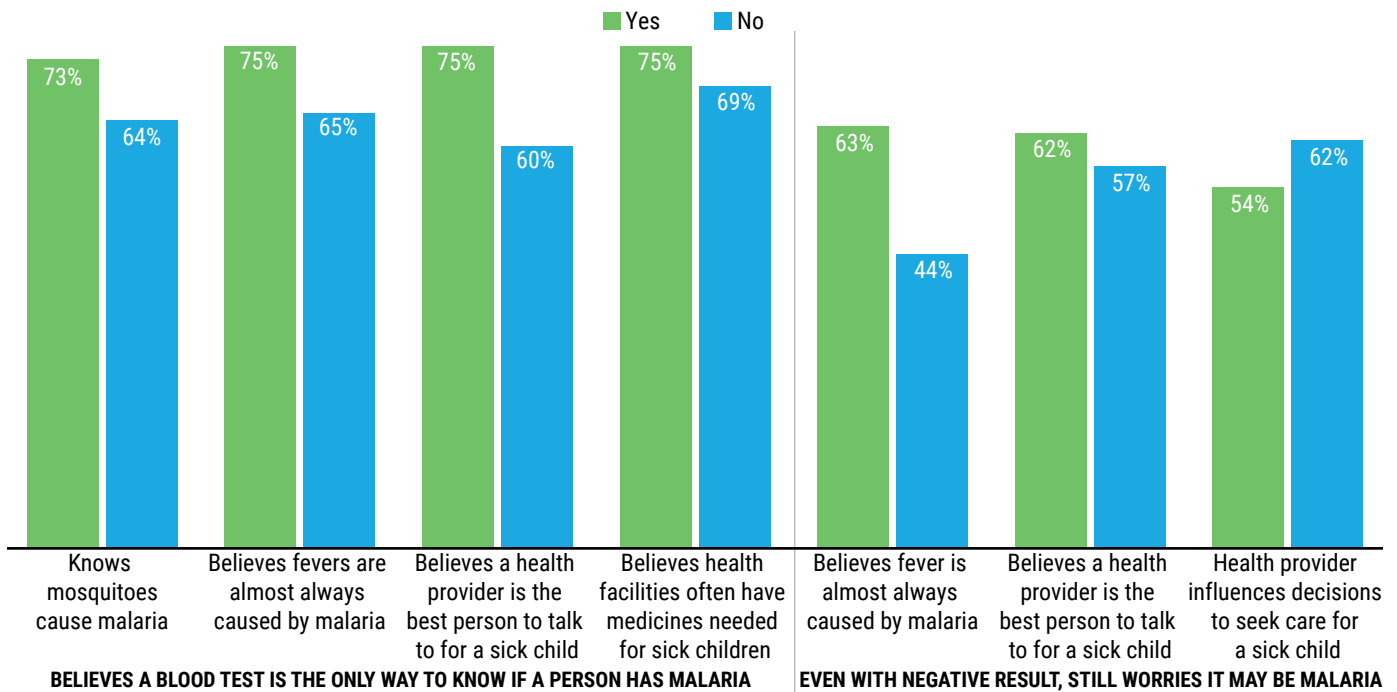
The results presented in this brief highlight areas where SBC programming may help improve uptake of malaria prevention and treatment behaviors in northwestern Nigeria. Findings point to the continued need to improve access to LLINs within households, importance of ANC attendance, and pregnancy-related ideations for IPTp uptake, as well as perceptions of health services quality, self-efficacy for spousal communication, and beliefs about malaria tests for malaria case management practices.

Only about one-quarter of households had at least one net for every two people making increasing LLIN access within households a continued priority for malaria control programs. When there was LLIN access within households, LLIN usage among pregnant women and young children was very high.

IPTp use during pregnancy is contingent upon ANC attendance in this study area. SBC programs may need to emphasize pregnancy-related ideations (e.g., ANC knowledge and benefits) to raise ANC attendance and IPTp rates together, in addition to messaging about malaria risks during pregnancy. Spousal opposition was a commonly cited IPTp barrier, and more research is needed to better understand this opposition in order to inform SBC programming.

FIGURE 7 TRUST IN MALARIA TEST RESULTS ASSOCIATED WITH HEALTH SERVICES PERCEPTIONS AND CERTAIN MALARIA BELIEFS

Predicted probabilities* of malaria test perceptions among women 15–49 years, by ideational factor



*Predicted probabilities of malaria test perceptions were derived from mixed-effects logistic regression models adjusted for child health-related ideations (Table 1) and socioeconomic characteristics including household wealth, woman's age, ANC attendance at least 4 times, education (woman and spouse), employment (woman and spouse), child's age, sex. All ideational metrics presented are significant at the <0.05 level.

Health services perceptions were significantly associated with formal care-seeking, malaria test uptake, and trust in negative test results, underscoring the importance of perceived and actual health services quality to not only raise service usage rates but to also shape trust in diagnostic tools. Self-efficacy and malaria beliefs also influenced malaria test uptake and trust in negative results. SBC messaging should consider focusing on dispelling myths that most pediatric fevers are due to malaria to improve trust in negative test results, and foster beliefs about blood tests as the only way to know if a person has malaria. Women’s confidence in convincing her husband to seek care for sick children is also important, and programs should devise ways to support women’s empowerment to decide on how to care for sick children.

Annex 1: Ideational metrics in the malaria case management analyses

DIMENSION	DOMAIN	LIKERT-SCALE STATEMENT OR QUESTION
Cognitive	Knowledge	What do you think causes malaria?
		What are some things people can do to stop them from getting malaria?
	Beliefs about malaria	A blood test for malaria is the only way to know if someone really has malaria
		Even if the malaria test is negative, I always worry that it may still be malaria When a child develops a fever, it is almost always caused by malaria
Beliefs about health services	A health provider is the best person to talk to when a child is sick Health facilities in my community frequently have the treatments that are needed to treat a sick child	
Emotional	Self-efficacy	How confident are you that you could convince your husband/partner to let you seek advice or treatment for a sick child?
Social	Social influence	Besides yourself, who else may influence your decision about whether to seek advice or treatment for a sick child?
Intentions	Intentions	How likely is it that you would seek care the same day or next day if your child developed if your child developed a fever?

Annex 2: Ideational metrics in the IPTp analysis

DIMENSION	DOMAIN	LIKERT-SCALE STATEMENT OR QUESTION
	Knowledge about malaria and pregnancy	In your opinion, if a pregnant woman goes to ANC what are the benefits to herself?
		How many times should a woman receive a check-up during pregnancy?
		In your opinion, when should a woman go to antenatal care for the first time?
		What are the danger signs for pregnancy? That is, what signs and symptoms let you know that a pregnant woman needs to go to a health facility immediately? What can happen to a pregnant woman’s unborn baby if the woman gets malaria?
	Beliefs about malaria and pregnancy	When a pregnant woman gets malaria the effect on her and her unborn child is very serious
		The medicine given to pregnant women to prevent malaria works well to keep mother/baby healthy
		Pregnant women need antenatal care only if they are sick
		Pregnant women attending ANC 4+ times have safer pregnancies Only first-time pregnant women need ANC It’s important for a woman to discuss her pregnancy with her husband so they can make decisions together
	Beliefs about health services	It is better to use a traditional provider than a health facility for ANC
	Emotional	Self-efficacy
How confident are you that you could get to a health facility for ANC?		
Social	Social influence	Besides yourself, who else may influence your decision to go to at least 4 ANC visits at a health facility during pregnancy?
Intentions	Intentions	How likely is it that you would take IPTp during your next pregnancy?
		How likely is it that you would attend ANC 4+ times during your next pregnancy?

References

1. Countdown to 2015. Countdown to 2015: Maternal, Newborn & Child Survival, The 2015 Report. Accessed at: http://countdown2030.org/documents/2015Report/Nigeria_2015.pdf
2. Gove, S. 1997. "Integrated management of childhood illness by outpatient health workers: technical basis and overview," *WHO Bulletin* 75(Suppl 1):7–24.
3. WHO. 2009. "Parasitological confirmation of malaria diagnosis: report of a WHO technical consultation." Geneva: WHO.
4. DHS. 2019. *Nigeria Demographic and Health Survey 2018*. Maryland, USA: The DHS Program.
5. Awantang, G.N. et al. 2018. "Malaria-related ideational factors and other correlates associated with intermitten preventive treatment among pregnant women in Madagascar," *Malaria Journal* 17: 176. doi: 10.1186/s12936-018-2308-3
6. Koffi, A.K. 2017. "Beyond causes of death: the social determinants of mortality among children aged 1-59 months in Nigeria from 2009 to 2013," *PLoS One* 12(5): e0177025. doi: 10.1371/journal.pone.0177025
7. Do, M. et al. 2018. "Associations between malaria-related ideational factors and care-seeking behavior for fever among Children under five in Mali, Nigeria and Madagascar," *Malaria Journal* 13(1): e0191079. doi: 10.1371/journal.pone.0191079
8. Treleavan, E, J. Liu, L.M. Prach, and C. Isiguzo. 2015. "Management of paediatric illnesses by patent and proprietary medicine vendors in Nigeria," *Malaria Journal* 14(1): 232. doi: 10.1186/s12936-015-0747-7
9. Bedford, K.J.A., A.B. Sharkey. 2012. "Local barriers and solutions to improve care-seeking for childhood pneumonia, diarrhoea and malaria in Kenya, Nigeria and Niger: a qualitative study," *PLoS One* 9(6): e100038. doi: 10.1371/journal.pone.0100038
10. Kincaid, D.L. 2000. "Mass media, ideation, and behavior: a longitudinal analysis of contraceptive change in the Philippines," *Commun Res.* 27(6): 723- 763. doi: 10.1177/009365000027006003
11. Krenn, S. et al. 2014. "Using behavior change communication to lead a comprehensive family planning program: the Nigerian Urban Reproductive Health Initiative," *Glob Health Sci Pract.* 2(4): 427–443. doi: 10.9745/GHSP-D-14-00009

Acknowledgments

This programmatic research brief describes work led by Tulane University under Breakthrough RESEARCH. This brief and the work it describes is possible through the work and support of the Center for Research, Evaluation Resources and Development (CRERD), Breakthrough ACTION in Nigeria, Population Reference Bureau, and Population Council in Washington, DC.

Suggested citation

Breakthrough RESEARCH. 2020. "Malaria—Insights for improving malaria, family planning, and maternal and child health outcomes in northwestern Nigeria through social and behavior change programming," *Programmatic Research Brief*. Abuja, Nigeria: Population Council.

© 2020 The Population Council. All rights reserved.

Email

BreakthroughResearch@popcouncil.org

Breakthrough RESEARCH | Population Council

Plot 839 Idris Ibrahim Crescent | Jabi, Abuja, Nigeria
+234 806 778 7750

4301 Connecticut Ave., NW, Suite 280 | Washington, DC 20008
+1 202 237 9400 | breakthroughactionandresearch.org



Breakthrough RESEARCH is made possible by the generous support of the American people through the United States Agency for International Development (USAID) under the terms of cooperative agreement no. AID-OAA-A-17-00018. The contents of this document are the sole responsibility of Breakthrough RESEARCH and Population Council and do not necessarily reflect the views of USAID or the United States Government.



Our project turns evidence into action by providing thought provoking guidance to improve SBC policy and programming, with the goal of improving the cost-effectiveness of USAID's health and development strategies. Breakthrough RESEARCH catalyzes SBC by conducting state-of-the-art research and evaluation and promoting evidence-based solutions to improve health and development programs around the world. Breakthrough RESEARCH is a consortium led by the Population Council in partnership with Avenir Health, ideas42, Institute for Reproductive Health at Georgetown University, Population Reference Bureau, and Tulane University.