Behavioral Sentinel Surveillance Survey in Nigeria: Endline Technical Report for Couples

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Acronyms

ACT	Artemisinin-based combination therapies
ANC	Antenatal care
ARI	Acute respiratory infections
BCG	Bacille Calmette-Guérin
BSS	Behavioral Sentinel Surveillance
CI	Confidence intervals
CRERD	Center for Research, Evaluation Resources, and Development
CV	Community volunteer
DTP3	Diphtheria-tetanus-pertussis
FP	Family planning
HC3	Health Communication Capacity Collaborative
IPTp	Intermittent preventive treatment for malaria during pregnancy
IRB	Institutional Review Board
ITN	Insecticide-treated bed nets
JHU CCP	Johns Hopkins Center for Communication Programs
LGA	Local government area
LLIN	Long-lasting insecticidal net
MICS	Multiple Indicator Cluster Survey
MMR	Maternal mortality ratio
MNCH+N	Maternal, newborn, and child health plus nutrition
NDHS	Nigeria Demographic and Health Survey
ORS	Oral rehydration solutions
PHC	Primary health care
PMI	President's Malaria Initiative
PP	Percentage point
RDT	Rapid diagnostic tests
SBC	Social and behavior change
SMC	Seasonal malaria chemoprevention
U5MR	Under-5 mortality rate
USAID	United States Agency for International Development

Executive Summary

This technical report presents information from married couples on health norms, attitudes, and beliefs as part of the Behavioral Sentinel Surveillance (BSS) endline survey undertaken by Breakthrough RESEARCH/Nigeria in Kebbi, Sokoto and Zamfara States between October 1 and November 10, 2022. BSS surveys assess changes in indicators targeted by the integrated social and behavior change (SBC) activities of the USAID-funded Breakthrough ACTION/Nigeria's project. Breakthrough ACTION/Nigeria, which is slated to run from 2019 to 2025, utilizes SBC focused on the health areas of malaria; family planning (FP); and maternal, newborn, and child health plus nutrition (MNCH+N) in Kebbi and Sokoto states, as well as malaria-only SBC activities in Zamfara State. The project uses three primary SBC approaches: advocacy outreach to opinion leaders and community influencers at the state and local government area (LGA) levels, direct engagement of community members through community dialogues, group meetings and household visits, and SBC messaging campaigns through mass media and digital media.

The BSS endline survey follows survey waves conducted in 2019, at the inception of Breakthrough ACTION/Nigeria, and again in 2021. The endline survey was the only wave that collected information from both wives and husbands in all three states. The focus of this report is therefore to compare wives and husbands in terms of their health knowledge, attitudes, beliefs, perceived norms, and behaviors related to malaria, FP and MNCH+N for women of reproductive age and their husbands.. We then look explicitly at how concordance and discordance on these factors within couples are related with the priority behaviors targeted by Breakthrough ACTION/Nigeria. A separate report[1] with these same data examines the question of the relative effectiveness of integrated versus vertical SBC and looks specifically at trends from baseline to endline in behavioral outcomes and their hypothesized ideational antecedents.

About the BSS

The BSS employs a multi-stage sampling design to gather information from women of reproductive age and from their husbands on health behaviors and the factors that shape them. Using interviewer-directed, face-to-face interviews, the survey collects data on psychosocial influences across cognitive, emotional, and social domains. These influences have been identified by a range of behavioral theories as drivers of behavioral outcomes. As these theories suggest, an individual's beliefs, attitudes, perceptions of social norms, and sense of self-efficacy can all play a strong role in shaping their actions. By addressing these perceptions through Breakthrough ACTION/Nigeria interventions, positive changes in behavior may be encouraged. For this wave of the BSS, a total of 3,144 women between the ages of 15 and 49, each with a child under 2 years old, were randomly selected from wards within Breakthrough ACTION/Nigeria program areas. Interviews were also conducted with husbands for 2,866 of these women. In this report, we look at outcomes and behaviors for wives and husbands in aggregate and by state. In multivariate analysis, we examine how psychosocial influences within couple dyads relate to priority behaviors.

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[1] Breakthrough Research. (2023) Behavioral Sentinel Surveillance Survey in Nigeria: Endline Technical Report, Washington, DC: Population Council

Key Findings

Malaria

Nearly all wives and husbands possess basic malaria knowledge, including nearly universal awareness that malaria is transmitted by mosquitos, that malaria can pose serious risks to the baby if a pregnant woman gets malaria, and that LLINs and seasonal malaria chemoprophylaxis can prevent malaria transmission. There is clear recognition that children (wives: 95%, husbands: 94%) and pregnant women (wives: 96%, husbands: 95%) should always sleep under a mosquito net. Trust in antimalarials for pregnant women is also high (wives: 94%, husbands: 97%).

Even so, both groups hold important misconceptions, often identifying incorrect transmission mechanisms or having reservations about rapid diagnostic tests. For example, approximately one in five respondents identified at least one incorrect transmission mechanism (e.g., drinking dirty water, cold or changing weather, or teething). Further, while approximately two thirds of wives were aware of rapid diagnostic tests, only half of husbands were. While the majority of both groups (wives: 81%, husbands: 75%) agreed that blood tests are the only way to know if a fever is due to malaria, trust in the tests is lacking; more than half of wives (55%) and husbands (56%) reported that they still ask for malaria treatment even with a negative test.

Intentions to engage in appropriate malaria preventive and treatment measures were high among both husbands and wives, including prompt treatment seeking for their febrile child (wives: 96%, husbands: 97%), ensuring that all children sleep under a net (wives: 94%, husbands: 95%) and completing an entire course of malaria treatment (wives: 96%, husbands: 95%).

In multivariate regression analyses examining the influence of husbands' and wives' shared or differing beliefs on the use of long-lasting insecticide-treated nets (LLINs) among pregnant women and children under two, it was apparent that while most couples have a good understanding of basic malaria issues and the preventive role of LLINs, specific beliefs or misconceptions impact LLIN use in nuanced ways. Shared anxiety over potential malaria infection, regardless of diagnostic test results, did not significantly enhance LLIN usage. Interestingly, when both partners identified an incorrect cause of malaria, the use of LLINs paradoxically increased, possibly due to overcompensation, general health consciousness, heightened caution, or the effects of health messaging. However, when wives held misconceptions about malaria prevention mechanisms, LLIN usage dropped, suggesting that incorrect prevention beliefs could lead to neglect of effective prevention measures like LLINs. Notably, wives' beliefs appeared to exert a greater influence on LLIN usage than husbands', emphasizing the need for targeted health education for women. The data highlight the complexity of how knowledge, attitudes, and misconceptions about malaria interact to shape preventive behaviors and underscores the importance of comprehensive and correct health education, taking into account both partners' perspectives for effective malaria prevention.

Extending the multivariate analysis to the examination of treatment behaviors for a child with fever (including prompt treatment within 24–48 hours of fever onset, whether the child was given malaria test, whether any treatment was sought, and whether the child was given Artemisinin-based combination therapies [ACT][2]), we found that joint decision-making by both parents generally associates with higher probabilities of positive health

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[2] No data were collected on malaria test results, and hence it is not possible to know for certain if ACT treatment was appropriate in individual cases.

outcomes, with the only statistically significant difference found in the outcome for whether a child with fever was given a malaria blood test. Attitudes of individual partners, particularly the husband, also significantly influence certain behaviors. The husband's belief in health facilities' capabilities significantly influences the decision to seek prompt care and care from any provider, while joint belief leads to higher probabilities of ACT usage. The wife's confidence in convincing her husband to seek care positively influences all outcomes, with significant differences in prompt treatment and seeking care from any provider. Discussion about care-seeking appears to have varying impacts, with the wife's sole report of discussion positively impacting prompt treatment. The wife's gender equality attitudes correlate positively with seeking prompt treatment and care from any provider. The husband's involvement as an influencer significantly impacts the likelihood of the child receiving a malaria blood test. These findings highlight the importance of family dynamics in healthcare decision-making, and may inform future SBC interventions, emphasizing the role of husbands in decision-making processes, the value of joint decision-making, and the impact of wives' self-efficacy and gender equality attitudes.

Family planning

Awareness of modern contraceptive methods among both husbands and wives is high, although actual use and discussions about use remain low. More than nine out of ten respondents—both husbands and wives—were able to identify at least one modern contraceptive method but only one in five (wives: 16%, husbands: 21%) reported that they currently were using modern contraception. Most users (wives: 65%, husbands: 92%) cited the desire to space births; only one in ten cited a desire to limit births. Among non-users, the main reason for not using contraception was because such decisions are "Up to God" (wives: 26%, husbands: 35%). In Kebbi and Sokoto, more than one in five wives cited opposition by the husband as a reason for non-use, but only 4% of husbands in Kebbi and 11% of husbands in Sokoto cited their own opposition as a reason. Overall intentions to begin using contraception in the next six months were also low, with husbands (9%) being considerably less likely than wives (17%) to express that desire.

The results for beliefs and attitudes toward contraception are somewhat paradoxical. Less than half of wives and husbands (wives: 47%, husbands: 38%) approve of contraception for spacing births but the majority of couples (wives: 73%, husbands 64%) believe that using contraception leads to a better quality of life and that it is important for couples to discuss contraception (wives 77%, husbands: 70%). Belief in myths remains high, with approximately four of ten husbands believing at least one myth about contraception. Slightly fewer wives than husbands believe at least one myth overall. Common myths about contraception include that they can cause cancer (wives: 19%, husbands: 24%), that they can produce deformed babies (wives: 17%, husbands: 20%), and that they can make women promiscuous (wives: 19%, husbands: 23%). However, these differences, while statistically significant, are mostly small in magnitude. On the other hand, approximately two thirds of wives and just more than half of husbands recognize that contraceptive side effects are normal (safe) and usually go away within a few months.

While the majority of both husbands (70%) and wives (77%) believe that it is important for husbands and wives to discuss contraception, such discussions appear to be rare. Only 9% of wives and 16% of husbands reported that they had ever discussed the number of children to have with their partner, and only about a quarter of couples reported that they had ever discussed using modern contraception. In terms of decision-making, it was most commonly reported that couples decide together about use (wives: 50%, husbands: 56%). Joint decisionmaking was more common in both Kebbi and Zamfara than in Sokoto. For the wives, the top three influences on the decision to use contraception were her husband (79%), "no one else" (19%) and her mother-in-law (5%). For the husband the top three influences were "no one else" (76%), his wife (12%) and the health provider (7%).

Multivariate modeling suggests that normative influences, including approval of FP for spacing births, the belief that couples using FP have a better quality of life, and perceived community usage of FP significantly impact the uptake of modern contraception. Perception of contraception use as a normative behavior is positively associated with approval of FP and belief in its quality-of-life benefits. Injunctive norms also significantly shape attitudes toward FP, with joint approval by partners and the stance of religious leaders influencing these beliefs. Contrary to expectations, perceived stigma of using FP was associated with higher approval but lower belief in community use. Joint decision-making within couples significantly increased approval of FP, although it didn't significantly impact beliefs about its quality-of-life benefits or perceived normativity of FP use in the community. Gender equality attitudes showed no significant impact on FP approval or belief in its benefits, but were positively associated with the belief that most couples in the community use FP. The roles of husbands and wives differ, with husband's approval being more influential in the belief about community use of FP.

Extending the multivariate analysis to current use of modern contraception, we identify several key findings in terms of the role of attitudes, beliefs, knowledge, and agreement between spouses. There is a trend that when both husband and wife concur on a behavior-promoting factor, the likelihood of contraception usage increases. This was notable in cases of shared belief that most couples use FP or when they both approve of FP for birth spacing. However, discordance or negative concordance often resulted in decreased contraceptive use. These trends suggest that fostering shared positive attitudes toward contraception and dispelling misconceptions could aid in contraceptive uptake. Similarly, the practice of discussing FP between spouses significantly raises the probability of the wife using contraception. In terms of knowledge, understanding that side effects are normal and safe did not notably influence contraceptive use, emphasizing the importance of attitude over pure knowledge. Influencers also played a role, with husbands, more than other family members, impacting the wives' contraceptive use. However, the wives' confidence in her ability to convince her husband to use FP significantly boosted her own use of contraception, highlighting the need for empowering women in this respect. These findings suggest that SBC should target communication interventions not just at the individual level, but at the couple level, with a focus on fostering concordance and positive attitudes toward contraception, along with empowering women to confidently discuss and decide on contraceptive use.

Antenatal, delivery, and newborn care

Attitudes, beliefs, and behaviors related to pregnancy and childbirth remain heavily influenced by perceptions, at least among many husbands and wives, that formal care, including delivery care, is only necessary under certain circumstances. Overall, approximately six out of ten couples reported seeing someone for antenatal care (ANC), almost entirely at a government health facility, but only about one out four women delivered at a facility. Self-efficacy to seek care is high for both wives and husbands. For example, more than 80% of wives expressed confidence in the ability to start a conversation with their husband about attending ANC, 77% felt confident about getting to a facility for ANC, 58% felt confident about getting to a facility for delivery, and 88% felt confident that they could get to a health facility if complications arose. Even though about a quarter of the couples (wives 21%, husbands 25%) do not perceive pregnancy-related care as necessary, a majorityindicated an intention to use ANC services (wives 79%, husbands 86%) and have a facility delivery (wives 61%, husbands 80%) for the next pregnancy. These reported intentions include making four or more ANC visits (wives: 79%, husbands: 86%), taking SP/Fansidar to prevent malaria (wives: 83%, husbands: 89%), and delivering in a health facility (wives: 61%, husbands: 80%).

Among couples who chose to not make any ANC visits during the last pregnancy, many reasons were given but the most common was lack of perceived need (wives: 21%, husbands: 25%). Fatalism ("Up to God") (wives: 4%, husbands: 4%), spousal opposition (wives: 9%, husbands: 1%), and cost (wives: 4%, husbands: 2%) were mentioned with much lesser frequency. These reasons align with couples' attitudes. Overall, 48% of husbands

and 42% of wives agreed that pregnant women need ANC only when sick, while 57% of husbands and 33% of wives agreed that it is better to use a traditional provider than a health facility for ANC. Lack of perceived need was even more prevalent as a reason for not delivering in a health facility (wives: 43%, husbands: 33%).

Knowledge and awareness of pregnancy risks and the benefits of pregnancy-related care is fairly high. More than 95% of husbands and wives were able to identify at least one benefit to wives of ANC, and nearly all husbands and wives were able to mention at least one danger sign during pregnancy and at least one way to protect a newborn. Other indicators were less favorable. Only 54% of wives and 45% of husbands knew about attending ANC four or more times, and only about 30% of wives reported that a woman should go for her first ANC visit as soon as she thinks she is pregnant or in the first trimester. Nearly 6 out of 10 husbands knew this timing.

In multivariate results, we once again found that shared beliefs and attitudes between a husband and wife regarding the importance of discussing pregnancy, as well as the value of ANC, positively affect the likelihood of a woman making the recommended four or more ANC visits during pregnancy. While individual belief in these aspects can also have an influence, shared belief within the couple has a more profound impact. There is also an important role for self-efficacy: women who are confident in their ability to discuss ANC with their husbands are more likely to engage in the recommended ANC visits. The study also highlights the influence of certain community members: the woman's partner, mothers, friends, and community/religious leaders can all influence ANC attendance, though these effects can vary. Notably, a woman is more likely to make 4+ ANC visits when discussions about ANC occur, with the highest likelihood when she reports these discussions. Finally, education level and wealth appear to trend toward influencing ANC attendance, but none of the observed effects were statistically significant. The findings emphasize the importance of shared beliefs, communication within couples, self-efficacy, and social influences in increasing ANC attendance, suggesting the need for strategic SBC interventions to bolster these factors.

Child health

Both husbands and wives appear to share positive views about the quality of the health services in their communities. While quality of health services is measured by several constructs, couples were equally likely to believe that health providers are the best source of advice for a sick child (wives: 96%, husbands: 97%). However, there are discrepancies in perceptions of availability of treatment within individual states; in Kebbi, husbands are more likely to believe that treatments are available (wives: 74%, husbands: 89%), while in Sokoto the situation is reversed (wives: 82%, husbands: 61%). Husbands are considerably more likely to believe that health facilities have necessary treatments for sick children (wives: 70%, husbands: 85%).

As with other services and behaviors, the overwhelming majority of husbands, approximately 72%, do not believe that anyone else influences their care seeking decisions. This percentage is higher in Kebbi (85%) than in Sokoto (67%) and Zamfara (68%). Approximately one in seven husbands (15%) say that their spouse influences care seeking decisions, with a high of 19% in Zamfara and a low of 10% in Sokoto. Husbands are more likely to be influenced by health providers than wives are (wives: 2%, husbands, 7%). Nearly all wives (92%) reported that they are influenced by their husbands. Other influencers include mothers-in-law (wives: 9.4%, husbands: 4.1%) and mothers (wives: 7%, husbands: 7%). Very few of husbands and wives report that their decision is influenced by religious or community leaders (wives 0.2%, husbands 0.1%) or by friends (wives 1.4%, husbands 1.5%).

Breastfeeding: While nearly all children in these states are breastfed, at least for a while, other breastfeeding practices are performed with less than ideal regularity, largely because of early introduction of liquids other than breastmilk. Both husbands and wives were able to identify benefits of breastfeeding for women and for children

and hold similar beliefs about the nutritional value of breastmilk, including that breastmilk contains essential nutrients for the first 6 months of a child's life (wives: 89%, husbands: 93%). Yet, many husbands (32%) and wives (47%) do not consider it important for mothers to exclusively give children breastmilk in the first 6 months, providing a clear explanation for the reported sub-optimal breastfeeding practices. This coincides with common breastfeeding misconceptions: approximately 31% of husbands and 21% of wives believe that a mother's breastmilk after birth is bad milk.

How much self-efficacy wives have over breastfeeding is unclear. In Sokoto, 62% of husbands reported that that mainly they decide about exclusive breastfeeding, as did 32% of husbands in Kebbi and 26% of husbands in Zamfara. Yet only a minority of wives, albeit a substantial minority in some places, share this perception of husbands' influence; only 37% of wives in Kebbi, 29% of wives in Sokoto, and 19% of wives in Zamfara reported that breastfeeding is mainly their husbands' decision. Only 7% of husbands in Zamfara, 6% in Sokoto, and 18% in Kebbi indicated that breastfeeding was mainly their wife's decision. Relatedly, only 59% of wives feel confident that they can exclusively breastfeed a child for the first six months of life.

Looking specifically at exclusive breastfeeding for the first six months of a child's life, we find in the multivariate models that a woman's self-efficacy, autonomy in decision-making, and individual attitudes toward exclusive breastfeeding significantly affect the likelihood of a child being exclusively breastfed for the first six months. Intriguingly, while couple's concordance in beliefs and attitudes does not appear to enhance this effect, communication and joint discussions about breastfeeding between couples doubles the likelihood. Community norms and personal beliefs also play significant roles, primarily when the wife holds these beliefs. Interestingly, professional advice from health providers carries more weight than family opinions, considerably boosting the likelihood of exclusive breastfeeding. Mother's age and educational attainment, husband's education, and the household wealth quintile have limited impact on exclusive breastfeeding. For strategic behavior change communications, these findings underscore the necessity to boost women's self-efficacy, encourage shared couple communication and decision-making, and leverage the influence of healthcare providers. This multi-pronged approach could enhance breastfeeding practices, given the observed decline from baseline to endline.

Vaccinations: Child vaccination rates remain low. More than six out of ten children aged 12 to 23 months have not received a single vaccine, and complete coverage with all basic vaccinations ranges from a meager 4% in Sokoto to only 15% in Zamfara. This is in spite most respondents reporting favorable perceptions of vaccination services, pro-immunization social norms, and high self-efficacy to use vaccination services. For example, most husbands (89%) and wives (86%) agreed that most people in their communities trust immunization health workers and that health facilities often have vaccines available (wives: 78%, husbands: 83%). Couples also perceive of child vaccinations as a community norm; 74% of wives and 84% of husbands said that most parents in the community take children for routine immunizations. Further, couples also perceived high vaccine efficacy and appropriate risk perceptions, with most (wives: 75%, husbands: 86%) recognizing that vaccines can prevent severe illnesses. Self-efficacy is high; approximately three quarters of wives indicated that it is easy to take children for vaccinations and easy to track their child's vaccinations.

Even so, negative attitudes and beliefs are apparent. Approximately a quarter of wives (26%) and a third of husbands (34%) believe that vaccines can be dangerous to a child's health. Further, the number one reason reported by wives for why a child might not be vaccinated was a husband's opposition, cited by approximately half of wives of unvaccinated children. A further quarter of wives cited the belief that vaccines are not safe or have negative side effects. Distance or absence of transport was cited only by one in ten wives. Husbands also cited spousal opposition (30%), cost (19%) and distance to facility as top reasons why community members may not get their children vaccinated. As with other health services, husbands appear to be the principal influence

for decisions about child vaccinations, ranging from 82% in Zamfara to 93% in Kebbi. Regardless, both husbands and wives indicated a high likelihood to vaccinate their next child (wives: 77%, husbands: 91%).

The multivariate results identify several key factors influencing the likelihood of children aged 12–23 months receiving full immunizations. Specifically, the involvement of wives in immunization discussions significantly increases the probability of full vaccination, highlighting the importance of maternal engagement in health decision-making. Similarly, the mother's knowledge of vaccination timing outweighs the father's, yet shared parental knowledge leads to the highest vaccination rates, suggesting that mutual understanding within couples is beneficial. The data also points to the importance of community norms and husband's approval in enhancing vaccination likelihood. Interestingly, the husband's education level shows a statistically significant inverse relationship with vaccination rates, warranting further exploration. Other factors such as mother's age, wealth quintile, and child's gender showed trends but were not statistically significant. Given these findings, SBC programs should focus on promoting immunization discussions, particularly involving wives, enhancing maternal knowledge and engagement, fostering shared knowledge among couples, leveraging community norms, and incorporating demographic nuances. Also, strategies to involve health providers more actively in influencing immunization decisions should be considered, given their potential impact.

Acute Respiratory Infections: Significant gaps exist in awareness of the symptoms of pneumonia, more so among husbands than wives. More wives (62%) than husbands (47%) identified cough as a symptom of pneumonia, but only 40% of wives and 25% of husbands recognized rapid or difficult breathing as a sign of pediatric pneumonia. A considerable proportion of wives (40%) and husbands (49%) across all three states were unable to report or identify any effective medicine for treating pneumonia, and only 46% of wives and 40% of husbands were able to identify any antibiotic as a possible treatment. Awareness of antibiotics was highest among respondents in Kebbi (wives: 70%, husbands: 61%).

Most respondents (wives: 88%; husbands: 87%) were aware that pneumonia can be severe for children, possibly leading to hospitalization or death, but misconceptions persist. Two-thirds of males (66%) and 56% of females believed that only weak children are at risk of dying from pneumonia, with similar patterns observed across the three states. Intentions for pneumonia care-seeking and treatment would seem to indicate that children with pneumonia symptoms will receive appropriate care. Most respondents (wives: 91%; hubands: 91%) indicated that they would ensure that any child with pneumonia symptoms would complete a full course of antibiotics, and that they would seek treatment promptly for pneumonia symptoms (wives: 93%, husbands: 94%). Conversely, data indicate that less than half of children with pneumonia symptoms (43%) were taken for formal sector care while one in three children received care from informal medical sources (33%) and only about one in three children received treatment with antibiotics.

In multivariate modeling, we examined factors influencing the decision to seek formal healthcare for children exhibiting pneumonia symptoms. The data suggests that joint decision-making by both husband and wife results in the highest probability (41.0%) of seeking formal care. A significant drop in this likelihood occurs if the mother-in-law influences the decision. The wife's knowledge about acute respiratory infection (ARI) symptoms significantly increases the likelihood of seeking formal care, while knowledge about antibiotics and beliefs in their efficacy do not have a significant impact. The wife's confidence in convincing her husband to seek formal care has a significant impact on general child sickness but not on specific pneumonia symptoms. Joint discussions between the wife and husband about seeking care are significantly associated with higher likelihood of formal healthcare seeking. Factors like mother's age, education levels of both spouses, and wealth quintile also play roles, with the husband's education notably being positively associated with seeking formal care. These findings highlight the importance of couple concordance, the wife's ARI knowledge, and the husband's education level in healthcare-seeking behaviors. Social behavior change (SBC) interventions should focus on encouraging joint

decision-making, increasing ARI symptom knowledge among wives, and promoting education among husbands. Additionally, understanding the impact of cultural norms, especially the influence of mothers-in-law, could inform interventions aimed at encouraging formal healthcare utilization for child illnesses.

Diarrhea: Awareness of the possible severity of diarrhea for children, of appropriate prevention behaviors, and of effective treatments is high in all three states. Husbands and wives were equally likely to be able to identify at least one way to prevent children from getting diarrhea (wives: 91%, husbands 91%) but they often differed in reporting specific ways. Almost 57% of wives identified "keeping the house and surroundings clean" as the principal way, as compared with 42% of husbands. Husbands were more likely to report vaccinations as a way to prevent diarrhea (wives: 19%, husbands 31%). Only 28% of wives and 19% of husbands cited handwashing, and less than one in ten husbands and wives cited giving only breastmilk for the first 6 months of life.

Most wives (76%) and husbands (78%) know about oral rehydration solutions (ORS) as a treatment for diarrhea, but significantly more wives (61%) than husbands (41%) were able to recall that zinc is an effective treatment for diarrhea. Nearly all husbands (96%) and wives (96%) can name at least one way that ORS helps children with diarrhea, with replacing lost water being the main reason cited (wives: 76%, husbands: 68%). Only about a third of husbands and wives specifically mentioned that ORS can prevent dehydration and only a fifth mentioned that it can replace salts and electrolytes. The majority of wives and husbands also were able to cite at least one benefit of zinc for children with diarrhea.

While most husbands (91%) and wives (93%) are aware that diarrhea can lead to dehydration and death, only three quarters know how to prepare ORS for treatment of diarrhea. Most husbands and wives indicated that they would engage in beneficial behaviors (e.g., continuing to breastfeed, giving a child ORS or giving a child zinc) but respondents were only presented with correct options, and it is difficult to know with complete certitude if agreement reflects correct knowledge or courtesy bias, particularly after respondents had already been asked a series of questions about the benefits of ORS and zinc.

We examined factors that potenitally influence the decision to give a child with diarrhea the recommended treatment of ORS and zinc, focusing on the roles and attitudes of the parents. The findings suggest that the wife's knowledge and beliefs about diarrhea treatment play a crucial role in the decision-making process, with the child's likelihood of receiving treatment highest when the wife is aware of ORS and zinc's effectiveness, and when she is confident in her ability to convince her husband to seek care. Concordance in attitudes between the parents also appears to increase the likelihood of treatment. Interestingly, norms around treatment availability and the prevalence of diarrhea in the community do not significantly affect the likelihood of a child receiving treatment, suggesting that decisions are more influenced by parents' knowledge of treatment options and trust in healthcare services. However, the influence of communication within couples was less clear, with data suggesting that when only the husband reports having a discussion about care-seeking, it results in a lower likelihood of the child receiving both treatments. Family dynamics, mother's age, education levels, and wealth quintile show mixed effects, while none of the findings reach statistical significance. These insights highlight the need for improving women's health literacy, promoting concordance in parental attitudes, and enhancing self-efficacy, which could influence child health outcomes, serving as a guide for future SBC programs.

Albishirin Ku! and Breakthrough ACTION/Nigeria program exposure

Self-reported exposure to any Breakthrough ACTION/Nigeria's *Albishirin Ku!* campaign media among wives varied from 39% in Zamfara, indicating considerable spillover from Sokoto radio, to 54% in Sokoto. The range was lower among husbands, from 31% in Zamfara to 50% in Sokoto. On average, exposure was higher among wives (43%) than among husbands (36%), although this result was not statistically significant. In Sokoto,

approximately 37% of husbands and wives reported having listened to the *Albishirin Ku!* program on the radio, while one in four husbands and wives listed to the program in Kebbi. Listenership was lower in Zamfara (wives: 23%, husbands: 10%). Among listeners, most reported listening at least once a week, with many of those listening a few times a week. Perceptions of the program were very positive. More than 98% of husbands and wives reported that they enjoyed listening to the program and nearly all said that they learned something new from the program. The potential for the benefits of the program to extend beyond direct listeners was clear; approximately 8 out of 10 listeners reported that they had discussed it with family and friends.

Women's self-efficacy and gender dynamics

The study highlights the significant role of a wife's self-efficacy and confidence in influencing health-related behaviors in multiple domains such as malaria prevention, FP, ANC, exclusive breastfeeding, child immunization, seeking formal care for child illnesses, and administering appropriate diarrhea treatment. For malaria prevention, wives' misconceptions about malaria prevention mechanisms significantly impacted the use of long-lasting insecticide-treated nets. In treatment behaviors for a child with fever, the wife's confidence in convincing her husband to seek care positively influenced all outcomes. For FP and contraceptive use, the wife's confidence in convincing her husband about FP significantly boosted her use of contraception. In ANC, women who were confident in their ability to discuss ANC with their husbands were more likely to engage in the recommended visits. For exclusive breastfeeding, a woman's self-efficacy, autonomy in decision-making, and individual attitudes significantly affected the likelihood of a child being exclusively breastfed. In child immunization, the involvement of wives in immunization discussions significantly increased the probability of full vaccination. For seeking formal healthcare for children with pneumonia symptoms, the wife's confidence in convincing her husband to seek formal care had a significant impact. Lastly, in diarrhea treatment, the child's likelihood of receiving treatment was highest when the wife was aware of the treatment's effectiveness and was confident in her ability to convince her husband to seek care. These findings underscore the need for SBC interventions that empower women and boost their confidence and self-efficacy in health-related decision-making.

Couples' communication and decision-making

Couples appear to recognize the importance of communication about health issues. Specifically, nearly all husbands and wives (98%) believe that it is important for couples to discuss child health and make decisions together and for a woman to discuss her pregnancy with her husband (95%). This is mostly borne out in practice, at least for child health. Approximately two thirds of wives reported that they have discussed any child health issue with their husband, either care-seeking for sick children (53%), immunizations (33%), breastfeeding (20%), or healthy foods for children (19%). Husbands were more apt to report discussions than wives; approximately eight of ten husbands reported a discussion of at least one child health topic, either care-seeking for sick children (65%), immunizations (57%), breastfeeding (34%), or healthy foods for children (20%). More than half of husbands (58%) and wives (51%) reported discussing attending ANC but only a quarter of couples reported discussing facility births. Contraception and fertility are the least likely health issues to be talked about; one one quarter of couples have talked about using contraception but only 9% of wives and 16% of husbands reported ever discussing the number of children to have.

The nature of those discussions, including who initiates, and how much power wives have in those discussions is less clear. Nonetheless, In the context of these health behaviors and outcomes, couples' discussions have a substantial impact. Wives' beliefs and their initiation of discussions often exert more influence on health practices than husbands', indicating a need for health education targeting women. Joint discussions or agreements between spouses usually result in positive health outcomes and behaviors, such as increased contraceptive usage, higher likelihood of ANC visits, and increased rates of children's vaccination. Discordance

or disagreement between spouses tends to lower positive health behaviors. Notably, the wife's confidence in her ability to discuss health-related issues with her husband significantly boosts behaviors such as contraceptive use, ANC visits, and seeking formal healthcare for a child. These findings highlight that SBC interventions should not just target individuals but also encourage and enhance couples' discussions and agreements, especially empowering women to initiate these conversations.

We also found that joint decision-making plays a significant role in a range of health behaviors. For most health issues, husbands indicate that decisions are made jointly, while wives' estimates of joint decisionmaking are generally 6-10 percentage points lower (e.g., 56% of husbands say that decisions about contraceptive use are made jointly versus 50% of wives). For nearly all health decisions, wives indicate that the husband is an important influence. Only a minority of husbands say the same about wives. In malaria treatment for children, joint decision-making between parents is generally associated with higher probabilities of positive health outcomes. Regarding FP, joint decision-making within couples significantly increases approval of its use, although it does not significantly impact beliefs about its quality-of-life benefits or perceived normativity. Regarding ANC, shared decision-making between a husband and wife about its importance has a positive effect on a woman making the recommended number of visits. With regards to immunization, wives' involvement in discussions significantly increases the likelihood of a child being fully vaccinated. In the context of seeking formal healthcare for children exhibiting pneumonia symptoms, the highest probability of seeking care comes from joint decisions made by the husband and wife. These findings underline the importance of joint decision-making in health behaviors, suggesting that future SBC programs should emphasize the need for both partners to be actively involved in healthcare decisions.

Couples' concordance and key behaviors

In multivariate analyses, we examinedhow concordance and discordance in attitudes, norms, and beliefs within a couple associate with the likelihood that a couple would engage in those behaviors. Multivariate (logit) regressions were estimated in which variables identified if neither partner agreed with a statement, only the wife agreed, only the husband agreed, or they both agreed.

The multivariate regression analyses reveal that shared beliefs and attitudes within a couple, often, but not always, increase the likelihood of positive health outcomes. Yet, there is notable variability depending on the health area. For instance, in malaria prevention, shared misconceptions paradoxically increase LLIN usage, while in FP, contraceptive usage is influenced more by shared approval and perceived normativity. Treatment behaviors for a child with fever are influenced by shared decision-making and individual attitudes, whereas for ANC, shared beliefs about ANC importance and pregnancy discussions increase the likelihood of the recommended visits. Exclusive breastfeeding is significantly influenced by the mother's self-efficacy and shared discussions, while child immunization is positively associated with the wife's involvement in discussions, maternal knowledge of vaccination timing, and shared parental knowledge. Seeking formal healthcare for pneumonia symptoms is significantly linked to joint decision-making, the wife's knowledge of ARI symptoms, and the husband's education level. Lastly, diarrhea treatment with ORS and zinc is influenced by the wife's knowledge, confidence, and agreement between the parents.

On the role of wives and husbands, it appears that in most health areas, wives' beliefs, knowledge, attitudes, and norms exert a more substantial influence on the likelihood of positive health outcomes. Wives' misconceptions about malaria prevention decrease LLIN usage, while their confidence in convincing their husband to seek care increases the likelihood of prompt treatment for a child with fever. Wives' approval of FP influences beliefs about community use of FP, and their confidence in discussing FP boosts contraception use. Women's confidence in discussing ANC and initiating these discussions significantly enhances ANC attendance, while their self-efficacy and autonomy greatly affect exclusive breastfeeding. Wives' involvement in immunization discussions, their knowledge of vaccination timing, and their knowledge about ARI symptoms

substantially boost the likelihood of full vaccination and seeking formal care for pneumonia symptoms. Lastly, the wife's knowledge and beliefs about diarrhea treatment and her confidence in convincing her husband to seek care increase the likelihood of a child receiving ORS and zinc treatment.

In contrast, husbands' roles seem more varied across health areas. Husbands' belief in health facilities' capabilities significantly influences prompt treatment and care-seeking for a child with fever. Their approval influences beliefs about community use of FP and the wives' contraceptive use. Their education level plays a significant role in healthcare-seeking for pneumonia symptoms, while when only they report having a discussion about care-seeking, it decreases the likelihood of the child receiving ORS and zinc treatment.

These findings imply that shared beliefs and attitudes, especially those of wives, have substantial effects on health behaviors. However, the relative influence of shared beliefs, wives' influence, and husbands' influence can vary by health area, suggesting that SBC programs should be tailored accordingly. While enhancing shared beliefs and attitudes can often yield positive health outcomes, it is crucial to also address misconceptions, particularly among women. Given the significant influence of wives' beliefs, knowledge, attitudes, and norms in most health areas, SBC programs should particularly focus on empowering women, improving their health literacy, and boosting their self-efficacy and confidence in decision-making and discussions. Husbands' roles, while more variable, are nonetheless essential and should be considered, particularly their beliefs, education level, and involvement in discussions. These insights highlight the need for multi-level, nuanced, and gender-sensitive SBC interventions for effective health promotion.

Health services

Perceptions about the health system play a pivotal role, and factors such as the availability and quality of services, supplies, and trust in the health system significantly shape health behaviors. Overall, there appear to be high levels of trust in health providers and in the quality of their care, as well as in the efficacy of available prevention mechanisms and treatments, including for antibiotics for child pneumonia, antimalarials for pregnant women, and LLINs. Almost no wives cite poor quality as a reason for not using health services. Husbands are more apt to cite poor quality but even then it is generally not the primary reason. Cost is very rarely cited as an impediment.

Perceptions of need

Even with high trust in health services, many couples choose not to use them, most notably pregnancy-related services, because they do not perceive those services to be useful or necessary except under adverse circumstances or when problems arise. Among couples who chose to not make any ANC visits during the last pregnancy, the most common reason was lack of perceived need (wives: 21%, husbands: 25%). This extends to FP as well. Major reason for not using a contraceptive method was fatalism (wives 26.3%, husbands 34.5%). For the latter issue, nearly all wives and husbands can identify benefits to both women and children from using contraception, and yet less than half of wives and only a third of husbands approve of its use, likely due to a combination of wanting more children or because fertility is "Up to God."

Conclusion

Overall, this study identified key aspects impacting various health behaviors including malaria prevention, FP, ANC, breastfeeding, child immunization, and care-seeking behaviors for children with pneumonia and diarrhea. Shared beliefs and attitudes between couples, the wife's self-efficacy and health literacy, and joint decision-making emerged as critical influences across these areas. Although misconceptions sometimes unexpectedly increased preventative measures, enhancing accurate health knowledge remains paramount. The dynamics within the couple, community norms, and influences of key stakeholders like religious leaders were significant,

while socio-economic status, education levels, and age showed mixed effects. Based on this detailed study of couples' dynamics, several critical recommendations can be made for the future design and implementation of SBC programs.

First, the importance of fostering open communication and shared decision-making within couples stands out as a crucial factor across all health behaviors. For instance, shared decision-making was found to significantly increase the likelihood of positive health outcomes for a child with fever and seeking formal healthcare for a child with pneumonia symptoms. Moreover, shared positive attitudes between partners toward contraception were associated with higher usage of modern contraceptives. Therefore, encouraging dialogue and consensus between partners should be a cornerstone of SBC programs.

Second, attitudes and beliefs have a significant influence on health behaviors and outcomes, and their cultivation should be prioritized over purely enhancing knowledge. This is exemplified by the observation that misconceptions about malaria prevention could lead to a neglect of effective measures like LLINs, despite overall understanding of malaria issues. Similarly, attitudes toward FP and beliefs about community norms were found to significantly impact contraceptive use. Therefore, SBC programs should aim to correct misconceptions and shape positive attitudes toward key health practices.

The analysis also underscores the significance of gender dynamics in health outcomes. The influence of wives' beliefs and self-efficacy emerged as a strong determinant across various health domains, including malaria treatment, FP, ANC visits, breastfeeding, and child health management. For instance, a wife's confidence in her ability to discuss ANC with her husband increased the likelihood of her engaging in the recommended ANC visits. Simultaneously, the role of husbands in decision-making was particularly relevant for child health issues and FP. SBC interventions should therefore address the different roles of husbands and wives and aim to boost women's self-efficacy in communicating health concerns and making decisions.

Furthermore, the analysis highlights the potential of leveraging the influence of health providers, community/religious leaders, and other family members in promoting health behaviors. Particularly, the advice from health providers was found to significantly boost the likelihood of exclusive breastfeeding, and community norms along with the husband's approval enhanced vaccination likelihood. Thus, influencers should be integrated into SBC programs, especially health providers given their direct contact with target populations.

Certain health areas emerged as requiring increased emphasis. Shared beliefs, communication, self-efficacy, and influencers played a significant role in areas like ANC, FP, and child health management. Furthermore, misconceptions were notably impactful in health behaviors related to malaria prevention and diarrhea treatment.

Finally, demographic factors, including education level and wealth, showed trends but were not always statistically significant. However, the study noted an unexpected inverse relationship between the husband's education level and child immunization rates, which warrants further investigation. SBC programs should thus be mindful of demographic factors and be prepared to delve deeper into unanticipated findings.

In conclusion, the study highlighs that health behaviors and outcomes are influenced by a complex interplay of factors, including knowledge, attitudes, norms, self-efficacy, communication within couples, perceptions of need, and influencers. These factors should not be considered in isolation but integrated into a comprehensive approach for successful SBC program design. By considering these recommendations, SBC interventions can be better tailored to the nuances of behaviors and thus potentially exert a more significant impact on health outcomes.

Background

The United States Agency for International Development (USAID)/Nigeria contributes to a healthier, better educated population by increasing the utilization of quality primary health care (PHC) services in targeted states and population groups. USAID/Nigeria coordinates with the Nigerian government with the aim of improving human resources for health to deliver high-impact services, and of strengthening leadership, management, governance, and accountability necessary for program ownership and sustainability. This partnership with local governments, including the private sector aims to improve a wide set of health outcomes related to family planning, FP, malaria, and maternal, newborn, and child health plus nutrition (MNCH+N) among most at-risk communities in Nigeria (USAID 2019).

Family planning in Nigeria

Modern contraceptive use in Nigeria has been historically low, without significant increases for much of the past three decades (Adebayo et al. 2013). According to the 2021 Multiple Indicator Cluster Survey (MICS), the modern contraceptive prevalence rate among married women of reproductive age was estimated to be 18% nationally but only 11% in northwestern Nigeria, the region considered in this study (including Kebbi, Sokoto, and Zamfara states) (National Bureau of Statistics and United Nations Children's Fund 2022). The total fertility rate of 4.6 births per woman in Nigeria remains one of the highest in the world and is substantially higher in the northwest (6.3 births per woman). High total fertility can be attributed to many factors, including high rates of teenage pregnancy, early marriage, low modern contraceptive prevalence among married women, and high unmet need for FP (Babalola et al. 2015; Hutchinson et al. 2021; Speizer & Lance 2015). The northwest region has the highest adolescent birth rate, at 118 births per 1000 adolescent females (15-19 years), relative to the national average of 75 births per 1000 adolescent females (National Bureau of Statistics and United Nations Children's Fund 2022). A high fertility rate not only affects women and children's health and survival, but also their long-term education and employment prospects (World Bank 2011).

The World Fertility and Family Planning 2020 report projected with a 95% probability that by 2030, 12 to 41% of women in Nigeria will be using modern contraceptives (United Nations Department of Economic and Social Affairs 2020). However, achieving requires addressing common misconceptions and negative perceptions about FP use, such as beliefs that contraceptives are dangerous to a woman's health or that they can harm a woman's womb (Ankomah et al. 2011; Measurement Learning and Evaluation Project et al. 2015). Women's and partners' opposition to contraceptive use and the desire for more children are among the predominant reasons for non-use of modern contraceptives (Hutchinson et al. 2021; World Bank 2011).

The use of social and behavior change (SBC) interventions remains a promising avenue for shifting attitudes and norms related to fertility and FP in the northwest region, although reaching many women may require more direct interpersonal communication with health workers, community and religious leaders, and peers. According to the 2021 MICS, only 36% of women report exposure to any mass media (radio, television, newspaper) at least once per week, potentially limiting the potential effectiveness of mass media (National Bureau of Statistics and United Nations Children's Fund 2022).

Nationwide, about one-third of women aged 15 to 19 years reported having heard any messages regarding FP in the past six months, with generally lower awareness in Kebbi State, relative to Sokoto and Zamfara, which are closer to the national estimates. Considering that more than 60% of women in northwestern Nigeria have not

been exposed to any FP messages either through media or other sources (National Population Commission (NPC) [Nigeria] & ICF 2019), there is ample opportunity to effect change through SBC programming.

MNCH+N in Nigeria

Nigeria has some of the highest infant and child mortality rates in the world (Countdown to 2030 2019). The 2021 MICS reported that the under-5 mortality rate (U5MR) was estimated at 102 deaths per 1,000 live births in the five-year period before the survey, while the infant mortality rate was estimated at 63 deaths per 1,000 live births (National Bureau of Statistics and United Nations Children's Fund 2022). These figures make Nigeria the largest contributor to child deaths in the Africa region. Moreover, the highest U5MR was found in northwestern Nigeria (at 89 deaths per 1,000 live births), including Sokoto, Kebbi, and Zamfara. The leading causes of child deaths include neonatal conditions, pneumonia, diarrhea, and malaria. Routine immunization rates remain low in Nigeria, with only 44% of children aged 12–23 months receiving all basic antigens and only 36% receiving all recommended antigens for the first year of life. In the northwest, the corresponding figures were lower, only 34% and 25% respectively (National Bureau of Statistics and United Nations Children's Fund 2022).

Appropriate treatment for common causes of childhood morbidity and mortality is low. Only 26% of children under 5 years with diarrhea received the recommended treatment of ORS and zinc, while only 39% with symptoms of pneumonia were taken to a public or private health facility or provider for care. Currently, only one-third (34%) of children 0-5 months are exclusively breastfed for the first six months of life (National Bureau of Statistics and United Nations Children's Fund 2022).

According to NDHS 2018, the Nigerian maternal mortality ratio remains among the highest in the world, at 512 maternal deaths per 100,000 live births in the seven-year period before the 2018 survey (National Population Commission (NPC) [Nigeria] & ICF 2019). The main causes of maternal deaths include hemorrhage, hypertension, and indirect causes. In 2018, 57% of women attended antental care (ANC) at least four times during their last pregnancies, and only 39% of births took place in a facility, while 43% were attended by a skilled health professional.

Malaria in Nigeria

Nigeria has more malaria deaths each year than any other country, accounting for nearly a third of the global total. Nearly all of the population is considered to be at risk of malaria (low and high risk) with approximately three-quarters considered to be at high risk. From 2015 to 2021, the number of malaria cases increased by 4.2% from 294 to 306 per 1000 population at risk (World Health Organization 2022).

The northwest of Nigeria exhibits some of the highest levels of malaria endemicity in the country (World Health Organization 2022), and each of the states in this study are considered by be high-transmission zones. Malaria transmission in the region is year-round with seasonal peaks within a four-month window from June to September. *Plasmodium falciparum* is the principal malaria species, and *Anopheles (An.) gambiae* is the predominant mosquito vector. The 2021 NMIS estimated malaria prevalence via microscopy among children aged 6–59 months to be 30%, as compared with the national average of 22%.

While there has been significant progress in malaria control activities in Nigeria, the availability of key prevention tools and engagement in malaria preventive behaviors is still not optimal. Insecticide-treated bed nets (ITNs)/ long-lasting insecticide-treated nets (LLINs) are distributed free of charge through ANC visits, EPI/well baby clinics, and mass campaigns, and in 2020, Nigeria distributed approximately 25 million insecticide treated nets

in 2020 (World Health Organization 2022). Nonetheless, as of 2021 only 56% of households owned at least one LLIN (National Malaria Elimination Program (NMEP) [Nigeria], NPC [Nigeria], and ICF 2022). While this is a significant improvement from 2008, when only 8% of households reported ownership of a net (NPC [Nigeria] and ICF Macro 2009), net ownership has improved much more slowly since 2013 when 50% of households had at least one ITN/LLIN (NPC [Nigeria] and ICF International 2014).

In the northwest where malaria transmission is high, household ownership of at least one ITN is above the national average and is estimated at 73% in Kebbi, 69% in Sokoto, and 66% in Zamfara. According to the 2021 NMIS, approximately 41% of children under age five and 50% of pregnant women slept under an ITN the previous night. As a whole, 38% of the population in Kebbi sleep under an ITN, as compared with 31% in Sokoto and 40% in Zamfara. Use by children under five in households with at least one ITN is 58% in Kebbi, 55% in Sokoto and 67% in Zamfara, while use by pregnant women in similar households is 66% in Kebbi, 57% in Sokoto and 75% in Zamfara (NMEP [Nigeria], NPC [Nigeria], and ICF 2022).

Intermittent preventive treatment for malaria during pregnancy (IPTp) is used to prevent malaria during pregnancy, and country-wide, approximately a third of women with a birth in the preceding three years took three or more doses of sulfadoxine-pyrimethamine (SP)/Fansidar during their last pregnancy (IPTp3). The northwestern states exhibited similar rates: Kebbi, 31%; Sokoto, 29%; and Zamfara, 27% (NMEP [Nigeria], NPC [Nigeria] and ICF 2022).

Appropriate testing and treatment for fevers in children is still far from the norm. Nationally, only 32% of children with fever in the past two weeks were taken for care the same or next day, and only 24% had blood taken from a finger or heel for testing. Prompt care seeking was lower in the northwest, ranging from 12% in Kebbi to 19% in Zamfara. Testing rates were lower than the national average in Kebbi (20%) and Sokoto (22%) but not Zamfara (33%). Nationally, nearly three quarters of children under age 5 with a fever for whom advice or treatment was sought were given any artemisinin-based combination therapies (ACT) but only 58% of children in the northwest were ((NMEP [Nigeria]. NPC [Nigeria], and ICF 2022).

According to the 2021 National Malaria Indicator Survey, less than half of women report exposure to any form of malaria SBC messaging in the past six months. Reporting is highest in Sokoto (44%), followed by Zamfara (43%), and Kebbi (35%) (NMEP [Nigeria], NPC [Nigeria], and ICF 2022). Radio is the most common source of exposure to malaria messaging (Kebbi: 21%, Sokoto: 29%, Zamfara: 28%) (Figure A-1). Other sources are much less commonly cited. Only in Zamfara (9%) was television a notable source of messaging, and only in Kebbi (3%) were IPC agents/community volunteers (CVs) mentioned. Exposure to malaria messaging via a community health worker (Kebbi: 7%, Sokoto: 3%, Zamfara: 5%) or town announcer (Kebbi: 1%, Sokoto: 5%, Zamfara: 5%) were also low, while in each state, less than 1% of women reported social media as a source of exposure.

Overall, there are high levels of knowledge of malaria prevention and transmission, but misconceptions about ways to manage malaria still remain.

Breakthrough ACTION in Nigeria: Overview and approach

Theory of Strategic Communication and Behavior Change

The Breakthrough ACTION/Nigeria Integrated Health SBC Strategy (January 2019) was designed using the Theory of Strategic Communication and Behavior Change (Figure A-2) (Kincaid 2000). In this model, SBC programs and interventions work to motivate individuals to make decisions and to act through three hypothesized ideational

domains—cognitive, emotional, and social. The two defining elements of attitude are beliefs and values, which indicate the perception of either the positive or negative consequence of a healthy behavior. Subjective norms involve an individual's thoughts around what other individuals within their communities are doing or what they think they are expected by others to do. Self-image refers to an individual's belief about themselves in relation to a behavior, and self-efficacy measures how confident a person feels to perform a certain behavior. The social component involves interpersonal processes aimed at persuasion to adopt a behavior.

This theory of change model, which was used to develop the SBC multi-level approach for influencing sociocultural and environmental determinants, specifies the relationships and structural factors that affect MNCH+N, malaria, and FP behaviors. Breakthrough ACTION's programming explicitly recognizes the centrality of community, household, and service delivery systems to effect desired change given the strong influence of social norms on behaviors and the critical role of health providers. Breakthrough ACTION also places a strong emphasis on the supportive environment as the foundational support to behavior change. Ideational factors are central to Breakthrough ACTION's SBC programming to help guide priorities and messaging, including knowledge, beliefs, values, risk perceptions, self-efficacy, social norms, perceived social support from key influencers, and spousal communication, among others. The more positive ideational factors held by a person about a given behavior, the more likely they are to engage in that behavior. Breakthrough ACTION has prioritized messages and activities to shift specific, actionable ideational factors for low prevalence behaviors, such as spousal communication about contraceptive use, as detailed in their strategy document.

Furthermore, in this model, communication is considered an external factor impacting other variables in the model and shows how and why it impacts both intention and behavior. Communication has an indirect impact on behavior through its effect on skills and knowledge, ideations, and environmental support and constraints. Thus, the components in this model can be described as the "cognitive, emotional, and social outcomes of communication and determinants of intention and behavior." Because these components of ideation are regarded as intermediate outcome variables impacting intention and behavior, the Kincaid model represents a causal chain of the determinants of behavior where change is interdependent, simultaneous, and interactive.

Figure A-1. Theory of Strategic Communication and Behavior Change
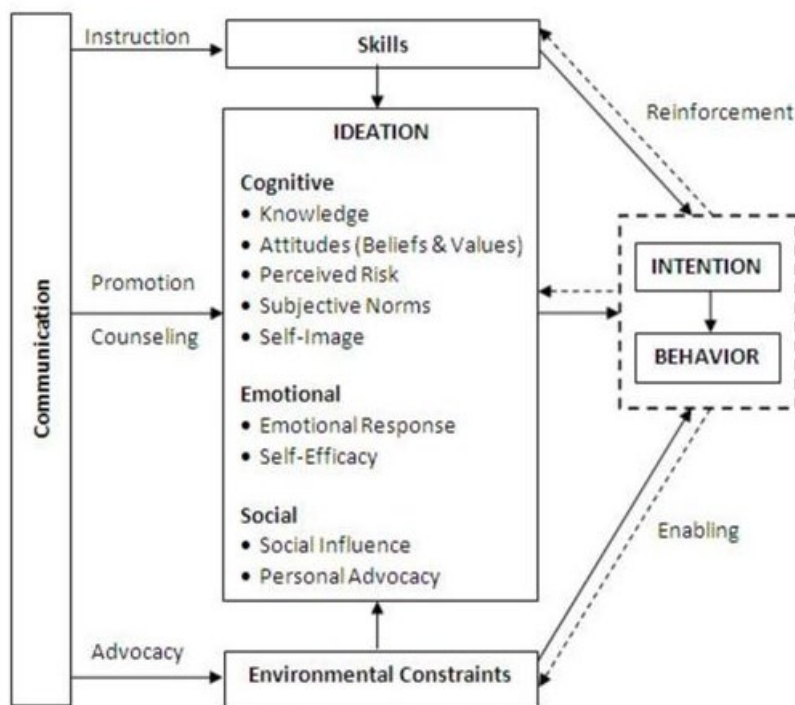
Kincaid DL, Delate R, Storey JD & Figueroa ME. (2013). Closing the Gaps in Practice and in Theory: Evaluation of the Scrutinize HIV Campaign in South Africa. In Rice R & Atkin C. Public Communication Campaigns, 4th Ed. Newbury Park, CA: Sage, pp. 305-319.

Integrated versus health-area-specific SBC messaging

Breakthrough ACTION/Nigeria uses a life stage approach to inform integrated SBC activities. Table A-1 describes the key objectives of each life stage. This approach was based on extensive formative research prior to implementation and resulted in a focus on gateway and/or multiplier effect behaviors, such as ANC and routine immunization. In addition, Breakthrough ACTION/Nigeria continues to support SBC messaging that promotes the use of malaria control interventions, including IPTp, LLINs, and seasonal malaria chemoprevention. Breakthrough ACTION/Nigeria also continues to implement SBC programming in support of USAID President's Malaria Initiative (PMI) malaria programming, service delivery partners, and commodities distribution.

Table A-1. Key objectives of the life stage approach for integrated SBC programming areas

Life Stage	Breakthrough Action Target Indicators
Life Stage 1 SBC messaging targeted to women planning for pregnancy and those in early pregnancy	Increase proportion of pregnant women who attend first ANC as soon as they become aware of pregnancy and at least four times during pregnancy and up to eight times
	Increase proportion of pregnant women taking three or more doses of IPTp as prescribed by health worker during ANC
	Increase proportion of pregnant women who adhere to nutrition counseling to improve dietary intake during pregnancy
	Increase proportion of pregnant women who sleep inside an insecticide-treated net
	Increase proportion of pregnant women/partners who develop a birth plan to increase intention to deliver at a health facility

	Increase proportion of pregnant women who deliver at a health facility and/or with a skilled birth attendant
	Increase proportion of pregnant women/partners who intend to use a modern contraceptive to space their children after pregnancy
Life Stage 2 SBC messaging targeted to women in late pregnancy and those with a newborn (first four weeks of life)	Increase proportion of pregnant women and their partners who develop a birth plan to increase intention to deliver at a health facility
	Increase proportion of new mothers placing their baby on their abdomen for warmth immediately after birth
	Increase proportion of new mothers who start breastfeeding within 30 minutes of giving birth
	Increase proportion of new mothers who use chlorhexidine to cleanse their baby's umbilical cord for seven days
	Increase proportion of mothers who complete all immunizations scheduled at birth per Nigerian policy
	Increase proportion of new mothers who use misoprostol to stop bleeding for postpartum hemorrhage
	Increase proportion of new mothers who adhere to nutrition counseling to improve dietary intake postpartum
	Increase proportion of new mothers and babies who sleep inside an insecticide-treated net
	Increase proportion of new mothers who attend postnatal care check-ups
	Increase proportion of pregnant women/partners using modern contraception to space births after pregnancy
Life Stage 3 SBC messaging targeted to women with young children under 5 years	Increase proportion of children between 12 and 23 months who are fully immunized per Nigerian policy
	Increase proportion of children under six months who are exclusively breastfed
	Increase proportion of children six months to 2 years whose caregivers follow recommended infant and young child feeding practices
	Increase proportion of children under 5 years who sleep inside an insecticide-treated net
	Increase proportion of children under 5 years with fever promptly taken for care and tested for malaria before treatment
	Increase proportion of malaria-positive cases that take a full course of ACT
	Increase proportion of children under 5 years with diarrhea promptly taken for care and given appropriate treatment
	Increase proportion of children between 12 and 23 months who are fully immunized per Nigerian policy
Life Stage 4 SBC messaging targeted to male partners	Increase proportion of men and women who use modern contraceptive methods
	Increase proportion of women who receive nutrition counseling to improve dietary intake
	Increase proportion of women, men, youth, and children who sleep inside an insecticide-treated net
	Increase proportion of women who intend to attend ANC early in their next pregnancy

Breakthrough ACTION in Nigeria: Program Implementation

Breakthrough ACTION/Nigeria, led by Johns Hopkins Center for Communication Programs (JHU CCP), leverages and expands the HC3 activities in Nigeria in three targeted states (Bauchi, Kebbi and Sokoto) **(Figure A-2)**.

Figure A-2. Map of Breakthrough ACTION/Nigeria areas
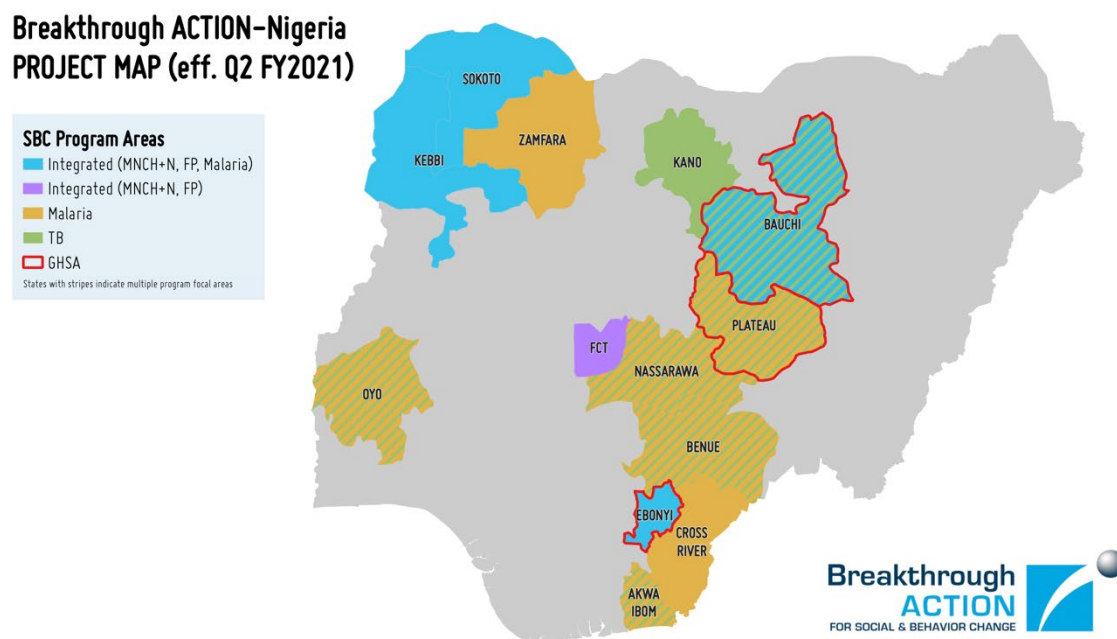
The official launch of these expanded, integrated SBC activities in the targeted states occurred on September 19, 2019, in Abuja, although staged implementation rolled out between early and late September in LGAs/wards in the integrated states of Kebbi and Sokoto.

During the COVID-19 pandemic, in-person SBC community activities were suspended from March to November 2020 including household visits and community events. There was gradual and limited re-implementation of these in-person activities in integrated states (Kebbi, Sokoto) starting in November 2020 as follows: Over the course of 2021, there were also rising insecurities in Zamfara and Sokoto state starting around November 2021. This further limited the scope of SBC in-person activities in these States for different periods of time and for affected areas. For these reasons, it was decided that the midline survey would be conducted in Kebbi State alone in November to December 2021.

In August 2022, when there seemed to be an improvement in the security situation of the region, CRERD sought and obtained institutional review board approval to conduct the third wave of the BSS survey, in all three states. However, the security situation deteriorated from September and throughout data collection in October, especially in Zamfara State, with a surge in banditry. More LGAs and wards considered unsafe were dropped from the sample of data collection sites and staff were only authorised to work in safe areas and to immediately evacuate any area that became unsafe during collection.

Objective

The partnership of Breakthrough ACTION/Nigeria and Breakthrough RESEARCH/Nigeria presents a unique opportunity to dovetail rigorous research design with state-of-the-art SBC programming to examine the effectiveness of integrated versus malaria-only SBC programming on ideations and behaviors among women with a child under 2 years in the areas of malaria, FP, and MNCH+N. The **primary objective** of this study is to collect and report on a selection of ideational and priority behavioral indicators across MNCH+N, malaria, and FP for women with a child under 2 years and their husbands living in Breakthrough ACTION/Nigeria program wards in Kebbi, Sokoto and Zamfara States. This information will then be used to inform Breakthrough ACTION/Nigeria program adaptation, implementation, and scale-up.

Methodology

Tulane University and the Population Council, in collaboration with the Center for Research, Evaluation Resources, and Development (CRERD), conducted the 2022 BSS survey from 1st October – 10th November 2022. This section describes the methodology for the overall BSS study and any methodological changes to the endline round. **Table A-2** provides an overview of the research activities, methods, and study instruments with a detailed discussion of these methods in the following subsections.

Table A-2. Study overview

Study design	For the BSS study, a quasi-experimental design was employed. Women with a child under 2 years in wards and LGAs with community-level SBC interventions from Breakthrough ACTION/Nigeria integrated program (Sokoto, Kebbi) are compared with women with a child under 2 years in wards and LGAs receiving Breakthrough ACTION/Nigeria malaria-only SBC support (Zamfara). Women with a child under 2 years are identified and interviewed cross-sectionally over the life of the Breakthrough ACTION/Nigeria project.
Study location	Breakthrough ACTION/Nigeria integrated implementation LGAs/wards in Kebbi and Sokoto States; LGA/wards with vertical malaria-only Breakthrough ACTION/Nigeria implementation in Zamfara State.
Study population	Women with a child under 2 years old living within Breakthrough ACTION/Nigeria programming wards in Kebbi, Sokoto, and Zamfara States. For the purpose of this report, the study population is referred to as female respondents.
Study period	June 2019 (Baseline) to April 2023 (Endline)
Sample size	Baseline: 3,020 female respondents Endline: 3,144 female respondents
Annex materials	Annex 1-a: Adult consent form (female) Annex 1-b: Guardian consent form Annex 1-c: Adolescent consent form Annex 1-d: Adult caregiver consent form for orphaned and vulnerable children interview Annex 2: Community screening instrument Annex 3-a: Household questionnaire Annex 3-b: Female questionnaire

Study location

For the overall BSS study, three states were identified, in collaboration with USAID/Nigeria and JHU CCP, for the study setting: Kebbi, Sokoto, and Zamfara. The three states, located in northwestern Nigeria, are contiguous and share a border with Niger Republic, while Kebbi also borders Benin to the west. The dominant religion and ethnicity in these states are Islam and Hausa, respectively. As of 2019, the estimated populations are approximately 5.8 million (Sokoto), 5.0 million (Kebbi), and 5.3 million (Zamfara) (Nigeria National Bureau of Statistics 2020).

The northwestern region has among the highest poverty rates in the country, with Sokoto, where 87.7% of the population is below the poverty line, having the highest poverty rate in the country (National Bureau of Statistics 2019). This is relative to the national average of 40.1% below the poverty line. Kebbi (50.2%) and Zamfara (74.0%) are also above the national average. Agriculture is the main source of income for people living in this region (Government of Sokoto 2018; Kebbi State Government; World Bank 2016).

Because this study is intended to monitor the effectiveness of the SBC interventions of Breakthrough ACTION/Nigeria, the focus was on the program wards and LGAs in which Breakthrough ACTION/Nigeria conducted its community-level SBC activities. Since Breakthrough ACTION/Nigeria community level SBC activities only cover targeted LGAs and wards across the three states, collected data are intended to be representative of populations within Breakthrough ACTION/Nigeria programming areas but not across the states at large. For the endline, data collection again occurred in all three states, with extreme heed taken of the moment-to-moment security situation on the ground. LGAs and Wards considered unsafe were dropped from the sample of data collection sites, and staff were only authorized to work in safe areas and to immediately evacuate any area that became unsafe during data collection. As a result, disruptions due to banditry and violence were minimized.

Study design

While the evaluation study for which these data were collected utilizes a cross-sectional, multi-round quasi-experimental design, this study uses a cross sectional design to compare norms, attitudes, and beliefs for husbands and wives both within states and for the sampled population as a whole.

Sample size estimation

For the overall BSS study, the sample size was estimated based on the quasi-experimental study design that contained three comparison arms: (1) high-dose intervention in integrated SBC areas, (2) standard-dose intervention in integrated SBC areas, and (3) malaria-only SBC programming. The sample was chosen to ensure the detection of expected changes in priority behavioral outcomes across integrated and malaria-only SBC areas in the quasi-experimental design. After careful deliberation, it was decided that dose comparisons would not be feasible due to security challenges and changes within Breakthrough ACTION/Nigeria programming. This decision occurred after the sample size calculations based on these three domains were already made, and after baseline data collection had occurred based on these domains.

To determine the required sample size for the BSS survey, a Stata 15.0 sample size routine for cluster sampling was used (Hemming & Marsh 2013). The parameters specified for the sample size estimation included a power criterion of 0.80, alpha coefficient of 0.05, and intra-cluster correlations that varied by key outcomes as shown below. Table A-4 presents the minimal detectable differences for priority outcomes. Based on this estimation, a

sample size of approximately 3,000 women with a child under 2 years were targeted for inclusion in each wave of the BSS survey, including the endline survey.

Table A-3. Priority indicators and minimal detectable differences

Indicator	Prevalence	ICC	Minimal detectable difference
ANC four or more	17.49%	0.29473	12-16 pp (a)
Facility delivery	5.99%	0.15223	5-9 pp (b)
Pregnant women slept under LLINs	17.68%	0.30883	12-17 pp (c)
Measles vaccination (12–23 months)	5.2%	0.12304	4-8 pp (d)
DPT3 vaccination (12–23 months)	3.89%	0.07575	3-6 pp (e)
Modern contraceptive use	<1.0%	0.03894	1-3 pp (f)

Notes: (a) clustersampsi, binomial detectable difference p1(0.1749) k(36) m(25) rho(0.28064); (b) clustersampsi, binomial detectable difference p1(0.0599) k(36) m(25) rho(0.15223); (c) clustersampsi, binomial detectable difference p1(0.1768) k(36) m(25) rho(0.30883); (d) clustersampsi, binomial detectable difference p1(0.052) k(36) m(25) rho(0.12304); (e) clustersampsi, binomial detectable difference p1(.0389) k(36) m(25) rho(0.07575)

Sampling

The sampling frame was generated through community screening involving a listing of all households with a woman of reproductive age with a child under the age of two years. Clusters/wards, which were selected using digital maps and grid sampling methodology. The sample frame consisted of 295 wards from the provided list of 2022 Breakthrough ACTION/Nigeria program areas. Using grid sampling, 113 clusters were randomly selected. This was more than the target of 90 clusters (30 clusters per state). For each state, clusters were held in reserve in case of issues of insecurity.

Table A-3. 2022 BSS sample design

	Number of LGAs in Breakthrough ACTION/Nigeria 2022 list	Number of wards in Breakthrough ACTION/Nigeria 2022 list	Total number of clusters selected	Number of clusters visited	Number of clusters not visited (reserve/ insecurity)
Kebbi	11	122	38	30	8
Sokoto	11	119	40	30	10
Zamfara	9*	54	35	26	9
Total	**31**	**295**	**113**	**86**	**27**

* Although Breakthrough ACTION/Nigeria had expanded to 9 LGAs in Zamfara State, the BSS, maintained the original sample of 5 LGAs as per the study protocol

We used the following sampling strategy to obtain the estimated sample size for the BSS study. From the community screening tool, we estimated that the average cluster/ward size to be 150 households. We therefore needed to randomly select 25 women per cluster with a child under 2 years distributed across 36 clusters per study arm. This yielded 900 women with a child under 2 years in each study arm, or 2,700 across the three states in the baseline round. It was further planned to sample an additional 300 women with a child under 2 years to allow for 10% non-response. The same sampling approach was used for the midline and endline rounds.

Within each sampled cluster/ward, the community screening tool was used for random selection of women with a child under 2 years using the following criteria:

1. The household must include at least one woman with a child under age 2 based on the community screening instrument.
2. The woman must be between the ages of 15 and 49 years.
3. The woman must be willing and able to provide informed consent to participate.

For the endline round, security considerations forced a decrease in the number of clusters visited and an increase the number of women selected in each cluster. Therefore, a random sample of 35 households from the eligible households in each cluster were selected in both Kebbi and Sokoto, while 40 households were selected in Zamfara State. In each of the selected households, an eligible woman was selected and consented for the female interview and her husband (if available) was selected and consented for the male interview. Either of them or another responsible adult responded to the household interview.

During fieldwork, data collection was interrupted because of insecurity in three clusters in Kebbi, and one cluster in Sokoto, while an entire ward could not be visited in Zamfara after community screening. To make up for the reduced numbers in these clusters, the sample take in safer clusters was increased. All these actions have been meticulously documented in the sampling table to ensure correct weighting of the data.

In total, data collection occurred in 86 clusters out of the planned 90 clusters.

Data collection and questionnaires

All eligible women were asked to respond to an interviewer-directed BSS female questionnaire in the baseline, midline and endline rounds. Development of the questionnaires was done through a collaborative process involving relevant stakeholders, including: Breakthrough ACTION/Nigeria, the Centre for Research, Evaluation Resources and Development (CRERD), JHU CCP, USAID Headquarters and Nigeria Mission, and PMI. In the female questionnaire, information was collected about the household including information on usual resident household members, bed net ownership and use, and household assets and characteristics. The female questionnaire also asked respondents about their demographics, reproductive history, contraceptive use, media exposure, gender norms, and behaviors for their last-born child within the past two years, including antenatal and delivery care, newborn care, breastfeeding, routine vaccination, malaria prevention and treatment, child and maternal nutrition, and childhood illness care-seeking and treatment.

Both the midline and endline waves included an objective that was not part of the original study protocol: to compare ideational factors for FP, malaria and maternal, newborn and child health and nutrition between wives with a child under two years of age and their husbands. Towards this end, a separate male questionnaire was developed for the midline round and used again for the endline round in order to better understand male knowledge, beliefs, norms, influence, and intentions across health areas, particularly given the importance of husbands on household decision making and healthcare seeking behavior for women and families. The male was harmonized with the ideational questions from the female questionnaire. During midline and endline fieldwork, the husbands of women selected for interview were also asked to respond to the male questionnaire. The goal was to compare husband and wife ideations across malaria, FP, and MNCH+N areas. The findings from this objective are presented in a separate report.

Based on learning from the baseline round and Breakthrough ACTION/Nigeria priorities, additional questions were included in the midline and endline rounds in the following areas: (1) spousal communication; (2) expanded malaria content including seasonal malaria chemoprophylaxis, seasonality of bednet use, and reasons for malaria test mistrust; (3) nutrition during pregnancy and for young children; and (4) exposure to Breakthrough-ACTION/Nigeria SBC programming including timing, content and perceptions.

Training, pre-testing, and fieldwork

After careful review of the security situation and logistics, CRERD decided to hold the resident training activities for the endline survey in Sokoto State and not in Kebbi or Zamfara. This meant that all fieldworkers were invited to Sokoto for training activities before returning to their respective states for data collection. To maintain the quality of training, these activities were staggered. Training for community screeners occurred from September 27 to October 2, 2022, while training for the main survey took place from October 5 to 12.

There were 5 field teams per state—on average each team consisted of 1 supervisor and 6 interviewers (4 females and 2 males). CRERD decided to recruit more female interviewers due to the length of the female questionnaire. Multiple security threats were experienced in Zamfara, as well as one incident in Kebbi state. The field teams communicated in real time to receive and share security briefs and progress reports and also to respond to situations in a timely manner.

These trainings included approximately 120 people including trainees, CRERD core staff, Breakthrough RESEARCH/Nigeria personnel, Breakthrough ACTION/Nigeria personnel as well as State Primary Health Care Development Agency and State Ministry of Health representatives. A training manual was produced for each fieldworker to facilitate training sessions on the study objectives and survey instruments, ethical considerations, and fieldwork procedures, with participation in a questionnaire pilot exercise. The questionnaire was translated into Hausa and pre-tested to confirm translations and skip patterns, and to assess question appropriateness and sequencing.

Fieldwork supervision and teams

CRERD supervised and managed the BSS midline survey implementation, as described in these sections. As previously described, each fieldwork team in Kebbi, Sokoto and Zamfara States had one supervisor and six interviewers (4 females and 2 males) who reported to the CRERD management team who monitored fieldwork as it was being conducted. There were also data quality assurance personnel who monitored the data for each upload and who flagged any issues of concern immediately for discussion and resolution.

Data entry and management

Survey questions were administered face-to-face by trained interviewers who entered responses into a secured handheld device (tablet). The handheld device was password-protected and the password was provided only to designated staff. Data from the handheld devices were removed from the device when uploaded to the central database. The completed data files on the handheld devices were encrypted after being completed. They were transmitted to the centralized storage in their encrypted format. Skips and data-entry checks were in place during the interview to prevent illogical data values. Survey data were uniquely identified through a numeric ID and were stored in central databases on password-protected computers that were transmitted regularly to the study investigators. All data were kept confidential and stored in a safe and secure place at Tulane and CRERD project offices.

Data quality assurance

CRERD selected the field teams based on proven integrity in data collection during previous performance in the baseline survey round. The following quality assurance checks were also conducted during data collection:

- Use of spatial data to ensure that interviewers went to the assigned location for the interview. This was done based on geolocated household positioning and Google Earth maps, which show key visual features to determine whether the location of the interview was correct.

- The use of timestamps in the data (at the beginning and end of each interview) provided two important pieces of information to evaluate data quality: interview start time and duration. A typical interview should occur between 7:30am and 8pm. Any interview outside these times was flagged as suspicious. If the interview was too long or too short (and if this happened in consecutive or frequent interviews), the supervisor or interviewer was asked to explain.

- Interviewer performance dashboard allowed the CRERD management team to monitor interviewer errors, time taken for interviews, and the number of interviews completed. All of the information consolidated on a dashboard was used to monitor the progress of each interviewer. The dashboard helped the survey management team to check on field workers' productivity. It was also a tool for identifying top-performing individuals and teams for recognition.

- Field inspection allowed CRERD management and field supervisory teams to monitor all aspects of fieldwork activities. These teams inspected interviews to ensure the respondents had enough privacy, consent was obtained, and questions were clearly asked. They also ensured that interviewers behaved in a culturally sensitive way during fieldwork activities.

Uploaded data files were also reviewed for completeness, clarity, and consistency of reporting:

- **Completeness**: All data files were checked to ensure that all planned interviews were conducted. This was done by matching the number of interviews documented in the field report with what was found in the uploaded files. If there were any discrepancies, this was flagged by the data auditors, and field supervisors were asked to explain the difference and resolve the problem. We checked that the same interview was not uploaded twice, and, if duplicates occurred, the interviewer was asked to identify the correct version for upload. We also checked that all variables were properly captured, and we performed a skip analysis to ensure no incorrect skip patterns occurred within the data.

- **Clarity**: We ensured that the data variables followed the questionnaire sequence. All value and variable labels were clearly worded in a concise manner in the final dataset for ease of analysis.

- **Consistency**: To ensure that the data files made logical sense, the following checks were conducted:

  - Review of outliers: Using central tendency, all continuous variables were evaluated for outliers. Numbers that seemed too low or too high were communicated to the teams. These were most often typographical errors (e.g., double digits instead of a single digit).

  - Population pyramid: We looked at the population pyramids across all three states to determine if the age and sex distributions we obtained from the household roster were realistic.

  - Average household size: Since we knew the average household size of each state, we were able to flag fieldworkers who returned household rosters with too few household members. In these cases, field supervisors were asked to verify data collected and to correct any issues if found.

  - Skip pattern analysis: We checked whether the skips were enforced before and after data cleaning.

Study sample and response rates

Table A-5 presents the study sample and response rates in the midline round for male and female respondents, respectively.

Table A-5. Study sample and response rates

State	Total women	Response rate (%)	Total men	Response rate (%)
Kebbi	1,088	100.00	1,065	99.9%
Sokoto	1,066	97.75	842	81.0%
Zamfara	1,013	99.80	959	98.6%
Total	3,167	99.18	2,866	93.1%

Ethical approval

The study protocol was approved by the National Health Research Ethics Committee of Nigeria on September 30, 2022. The protocol was also approved by Research Ethics Committees in all three states and by the Social and Behavioral Institutional Review Board at Tulane University. Written informed consent to participate in the survey was obtained from all willing participants for the female questionnaires. Each participant signed or marked her thumbprint on the consent form to signify willingness to participate.

Data analysis and results dissemination

For this report, results compare behavioral and ideational indicators ideational factors for husbands and wives in Breakthrough ACTION/Nigeria Program areas in each state and for the surveyed population as a whole. All point estimates were tabulated using weights to account for unequal probabilities of selection due to over- and under-sampling. Standard error estimation accounted for data clustering in the complex survey design.

The principal hypothesis that we test is the difference in proportions for indicators for wives relative to husbands for the full sample. To test for differences in proportions for wives relative to husbands, we calculate the corrected Pearson chi square statistic that adjusts for the complex survey design. The corrected Pearson chi square statistic is calculated using the second-order correction of Rao (1984), which converts the chi square statistic into an F statistic. While we do not present the test statistic, we do present the p value associated with the level of statistical signficance of the test statistic in the right-most column of the tables. Rejection of the null indicates that there are systematic differences across the two frequency distributions (I.e., differences between wive and husbands). Occasionally we will point out differences within individual states but we do not present test statistics and levels of statistical significance in those cases.

Using the methodology of Filmer and Pritchett (1998), we construct an asset-based measure of wealth based on ownership of key consumer durables. An index of wealth was created using the first principal component as calculated with the *polychoricpca* command in Stata (Kolenikov & Angeles 2009). Households were then categorized into quintiles from poorest to wealthiest. All analyses were conducted in Stata 17 (STATA Corp, College Station, TX).

Information generated from the study will be shared with research communities through well-established relationships with Obafemi Awolowo University, Ile-Ife (where our research partner CRERD is housed), and other academic institutions internationally. We will also present the study findings to key stakeholders including Breakthrough ACTION/Nigeria and other USAID implementing partners, governmental decision-makers at federal and state levels, the USAID mission in Nigeria, and other interested stakeholders. Finally, results will feed into regional presentations where applicable, and we anticipate that the rigor of this study design will evoke substantial interest in these findings from the global SBC community.

Chapter 1. Demographics

Sample

The overall sample consisted of 3,144 wives aged 15–49 years with a child under age two years and 2,866 husbands of those wives (Table 1.1.1).

Respondent characteristics

The average age of the wives in the sample was 28.1 years (Table 1.1.2). Husbands on average were 12 years older, with a mean age of 40.3 years. Wives were considerably less likely to have had any formal schooling but the magnituded of these differences varied across states. On average, 29% of women had no formal schooling versus 8% of husbands. In Kebbi, nearly half of all wives had no formal schooling versus only 9% of husbands. In Sokoto (30%) and Zamfara (21%), far fewer wives had no formal schooling. In Kebbi, the majority of husbands (59%) reported having Islamic education versus 30% of wives. Zamfara had the highest levels of formal education: 26% of wives had secondary or higher education as did more than half of husbands. There were no statistically significant differences between husbands and wives in ethnicity and religion.

Table 1.1.1. Study sample
Percentage of households, women 15 to 49 years with a child under 2 years, and husbands in the BSS study sample, by baseline and endline rounds

	Kebbi		Sokoto		Zamfara		Total	
Sample	Baseline	Endline	Baseline	Endline	Baseline	Endline	Baseline	Endline
Households with a child under the age of two	892	1,088	1,078	1,046	1,008	997	3,066	3,130
Wives with a child under 2 years	892	1,088	1,032	1,045	1,069	1,011	3,020	3,144
Husbands of interviewed women	N/A	1,065	N/A	842	N/A	959	N/A	2,866

Table 1.1.2. Wives and husbands characteristics

Percentage of women aged 15 to 49 years with a child under 2 years and their husband reporting sociodemographic characteristics (self-reports in the male and female questionnaires), endline round

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
| | Wife | Husband | Wife | Husband | Wife | Husband | Wife | Husband | p |
	%	%	%	%	%	%	%	%	val
Age distribution									
15–24	27.5	2.6	35.2	1.4	29.4	0.7	30.3	1.3	
25–34	49.8	30.7	48.5	26.4	45.2	23.9	46.9	25.9	243.37
35–49	22.7	51.8	16.3	55.1	25.3	50.8	22.8	51.9	**0.000**
50+	0.0	14.9	0.0	17.0	0.0	24.6	0.0	21.0	
Mean age	28.2	38.5	27.0	39.5	28.5	41.3	28.1	40.3	**0.000**
Education									
None	48.6	9.1	29.5	12.8	20.9	6.2	28.6	8.2	
Primary	8.6	7.1	4.5	8.9	10.4	9.8	8.7	9.0	12.47
Secondary/higher	12.6	24.7	4.8	15.2	25.7	52.2	18.4	38.9	0.000
Islamic	30.2	59.1	61.2	63.0	43.0	31.8	44.2	44.0	
Ethnicity									
Hausa	82.2	86.6	94.8	97.9	94.8	96.9	92.1	94.8	
Fulani	9.6	6.6	4.4	1.8	4.1	2.2	5.3	3.1	1.38
Other	8.3	6.9	0.8	0.4	1.2	0.8	2.6	2.1	0.252
Religion									
Islam	99.3	99.2	99.6	99.9	99.9	99.7	99.7	99.6	
Christianity	0.7	0.8	0.4	0.1	0.1	0.1	0.3	0.2	0.85
Traditional	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.402
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	

Table 1.1.3. Occupation Categories of Wives and Husbands
Percentage of women aged 15 to 49 years with a child under 2 years and their husbands by occupation, endline

Characteristic	Kebbi		Sokoto		Zamfara		Total	
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %
Not working outside home	18.0	0.7	27.7	1.0	14.4	1.6	18.0	1.3
Student	0.1	0.1	0.2	0.0	1.2	0.6	0.7	0.4
Professional	2.1	10.0	0.9	6.3	1.8	22.6	1.7	16.6
Sales/service	47.1	22.8	48.9	36.5	54.2	39.4	51.5	35.1
Skilled manual labor	7.4	4.5	8.7	4.6	8.4	6.7	8.2	5.8
Unskilled manual labor	12.2	1.4	10.9	0.7	5.2	0.7	7.9	0.8
Agriculture	10.9	59.4	0.5	47.5	5.0	26.9	5.3	38.2
Domestic worker	0.8	0.6	0.3	1.7	5.3	0.9	3.3	1.0
Other	1.5	0.5	1.9	1.6	4.6	0.7	3.4	0.8
N	880	1079	1066	1035	1043	1000	3114	2,861

Table 1.1.4. Occupations of Wives and Husbands

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands by occupation, endline

Characteristic	Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %
Other (specify)	1.5	0.5	1.9	1.6	4.6	0.7	3.4	0.8
Not working outside	18.0	0.7	27.7	1.0	14.4	1.6	18.0	1.3
Food vendor/sales/service	12.6	5.7	13.6	8.2	10.9	9.7	11.9	8.5
Grinding	2.5	1.1	2.5	0.6	2.3	0.4	2.4	0.6
Pounding (Grain pounding)	9.7	0.3	8.4	0.1	2.8	0.3	5.5	0.2
Selling cheese/awara/kulikuli	17.5	0.1	18.6	0.3	25.3	0.2	22.2	0.2
Shea butter making	0.3	0.0	0.1	0.2	0.4	0.0	0.3	0.0
Student	0.1	0.1	0.2	0.0	1.2	0.6	0.7	0.4
Clerical	0.0	0.5	0.0	1.0	0.1	1.6	0.0	1.3
Domestic worker	0.8	0.6	0.3	1.7	5.3	0.9	3.3	1.0
Professional technical (civil servants)	2.1	9.6	0.9	5.3	1.7	21.0	1.6	15.4
Beads making	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0
Blacksmith	0.0	0.4	0.0	0.1	0.0	0.7	0.0	0.5
Cosmetology (Soap or cream making)	0.4	0.0	0.1	0.1	0.4	0.4	0.3	0.3
Furniture making	0.1	0.6	0.0	0.7	0.3	2.4	0.2	1.7
Hair braiding/styling	3.1	0.3	3.9	0.2	3.0	0.2	3.2	0.2
Henna design	1.5	0.0	1.0	0.0	1.7	0.0	1.5	0.0
Knitting bags	1.0	0.3	0.8	0.1	0.1	0.0	0.4	0.1
Pottery (Making traditional pots)	0.1	0.2	0.1	0.0	0.1	0.4	0.1	0.3
Tailoring	3.8	1.4	4.0	1.4	6.7	0.8	5.5	1.0
Weaving	2.1	0.0	3.6	0.0	0.7	0.1	1.6	0.1
Welder for bucket/pots/water basin	0.0	0.6	0.0	0.6	0.1	0.5	0.1	0.5
Petty trading (Buying and selling)	11.4	9.8	11.5	18.2	11.1	13.7	11.3	13.7
Contribution (Adashe)	0.3	0.0	0.2	0.0	0.3	0.0	0.3	0.0
Agriculture/animal rearing/poultry	10.9	59.4	0.5	47.5	5.0	26.9	5.3	38.2

| Characteristic | Kebbi | | Sokoto | | Zamfara | | Total | |
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %
Okada rider	0.2	5.4	0.0	8.8	1.5	11.4	0.9	9.6
Driver	0.0	1.5	0.0	0.7	0.0	3.8	0.0	2.7
Mechanic	0.0	0.4	0.0	0.2	0.0	0.2	0.0	0.2
Builder	0.0	0.1	0.0	0.6	0.0	0.6	0.0	0.5
Barber	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2
Baker	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1
Cobbler	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Security	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.1
Cleaner	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.1
Miner	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.3
Carpenter	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.1
N	880	1079	1066	1035	1043	1000	3114	2,861

Chapter 2. Malaria

Nearly all wives and husbands possess basic malaria knowledge, and there are few statistically significant differences between the two. Awareness that mosquitoes are the cause of malaria is nearly universal, 98% of wives and 97% of husbands (Table 2.2.1). However, a good number of husbands and wives incorrectly identified non-relevant causes (Table 2.1.1), such as the belief that "cold or changing weather" can cause malaria (wives: 13%, husbands: 6%). Overall, approximately one in five wives and husbands identified at least one incorrect cause. In many cases, misconceptions were higher in Kebbi and Sokoto. For example, 18% of wives and 5% of husbands incorrectly identified drinking dirty water as a cause, relative to only 2% of both husbands and wives in Zamfara. Teething as a cause was also more commonly cited in Kebbi and Sokoto relative to Zamfara.

Wives (91%) and husbands (89%) are generally able to identify at least one risk to the baby if the mother gets malaria during pregnancy (Table 2.2.2). On average, wives were better at identifying risks than husbands. Wives were able to name an average of two risks, while husbands were only able to name an average of 1.5 risks.

Nearly all wives (95%) and husbands (92%) know that sleeping under a mosquito net can prevent malaria in children, and more than half (wives: 62%, husbands: 54%) know that avoiding mosquito bites can prevent malaria (Table 2.2.3). Overall, there were few relevant differences in knowledge between husbands and wives. Remarkably, husbands and wives in Kebbi were generally better than their counterparts in Zamfara in identifying other preventive mechanisms, such as taking preventive medication and spraying the house with insecticide.

Malaria beliefs and attitudes were by and large similar for husbands and wives, although husbands were more likely to believe that fevers are almost always caused by malaria (wives: 66%, husbands: 84%), while wives were more likely to report that a blood test is the only way to know if a fever is due to malaria (wives: 81%, husbands: 75%) (Table 2.2.4). While most husbands and wives both believe the veracity of blood tests, more than half (wives: 55%, husbands: 56%) still ask for malaria treatment even with a negative test.

Wives generally have a slightly higher knowledge of malaria tests compared to husbands, with almost two-thirds of wives being aware of malaria rapid diagnostic tests (RDTs), while just over half of husbands (54%) are aware (Table 2.2.6). Both wives (73%) and husbands (64%) are generally able to identify RDT or smear as types of malaria tests. However, it is noteworthy that in Zamfara, husbands have the lowest ability to identify RDTs compared to Kebbi (65%) and Sokoto (59%), with only 48% of husbands in Zamfara being able to do so.

The vast majority of husbands and wives in these states exhibit a strong likelihood to seek timely treatment for their febrile child. More specifically, over 95% of wives and husbands claimed that they would do so on the same or the following day (as presented in Table 2.2.6). Moreover, almost all survey respondents expressed a high probability of adopting preventive measures, such as ensuring all children sleep under a net (wives: 94%, husbands: 95%), as well as completing the entire malaria treatment regimen (wives: 96%, husbands: 95%). These high probabilities are consistent across all three states.

In summary, the study found that both wives and husbands in the surveyed states have good understanding of basic knowledge about malaria, with little significant difference between the genders. While awareness that mosquitoes are the cause of malaria is nearly universal, there are still misconceptions among some individuals, with one in five wives and husbands identifying at least one incorrect cause. Overall, wives were better at

identifying risks and knowledge of malaria tests compared to husbands. The study also found that husbands were more likely to believe that fevers are almost always caused by malaria, while wives were more likely to report that a blood test is the only way to know if a fever is due to malaria. However, most respondents still expressed a high likelihood of seeking timely treatment for their febrile child and adopting preventive measures, such as ensuring all children sleep under a net and completing the entire malaria treatment. The findings suggest the need for continued awareness-raising to address misconceptions and improve knowledge about malaria diagnosis and prompt treatment seeking for both husbands and wives, with emphasis on the husbands.

2.1 Malaria ideations

Table 2.1. Priority malaria outcomes

	Kebbi	Sokoto	Zamfara
	%	%	%
Long-lasting insecticide treated nets			
Ownership: Households with at least 1 LLIN	45.5	61.3	87.8
Full household coverage: Households with 1 LLIN for every 2 people	8.1	10.2	16.9
Access: Pct of pop that could sleep under an LLIN if each LLIN was used by 2 people	7.1	8.6	13.7
Pregnant women sleeping under LLIN	27.0	26.4	70.1
Pregnant women sleeping under LLIN in households with at least 1 LLIN	51.4	40.7	76.7
Pct of under 2s sleeping under LLIN	30.6	39.8	78.5
Under 2s sleeping under an LLIN in households with at least 1 LLIN	67.8	66.3	89.1
Pregnancy			
IPTp 3+ (last pregnancy)	33.3	14.8	21.4
Fever			
Formal care for fever	27.8	40.0	31.7
RDT	15.0	25.2	29.7
ACT given for fever	24.0	27.0	34.8
Treatment sought same day or next?	81.0	60.8	69.8

2.2 Malaria ideations

Table 2.2.1. Reported causes of malaria in children

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting the causes of malaria in children

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Mosquito bites	99.0	96.1	97.4	97.2	98.4	97.9	98.3	97.4	0.260
Dirty surroundings	26.5	21.1	8.6	11.7	27.0	14.9	22.9	15.7	**0.041**
Eating dirty food	12.3	6.5	0.9	4.3	1.3	1.2	3.6	3.0	0.480
Eating unripe mangoes	1.4	4.2	0.1	1.5	0.1	1.0	0.4	1.8	**0.000**
Eating cold corn	1.7	3.4	0.4	0.9	0.1	0.2	0.5	1.1	0.057
Drinking dirty water	17.5	4.6	2.1	17.8	2.1	1.6	5.4	5.4	0.982
Drinking beer	1.1	4.4	0.1	0.8	0.5	0.0	0.5	1.2	0.125
Getting soaked in rain	11.0	9.0	4.1	5.8	3.3	1.9	5.1	4.2	0.543
Cold or changing weather	16.2	9.0	7.5	5.1	13.0	5.9	12.5	6.4	**0.013**
Witchcraft	1.8	2.9	0.4	0.0	0.3	0.0	0.6	0.6	0.988
Teething	7.5	5.8	7.8	3.8	1.7	0.3	4.2	2.2	0.062
Indigestion	2.7	0.6	0.2	2.0	0.0	0.4	0.6	0.7	0.797
Other people sneezing or coughing	3.2	0.2	0.7	0.6	0.1	1.6	0.9	1.1	0.786
Any wrong cause[3]	**36.1**	**25.2**	**16.6**	**29.0**	**19.2**	**12.8**	**22.2**	**18.7**	0.303
N	1,083	1,065	1,032	841	986	958	3,101	2,864	

P val refers to significance test across all three states combined of H_o: mean value for wives = mean for husbands

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[3] Dirty surroundings were accepted as a correct <u>indirect</u> cause of malaria.

Table 2.2.2. What are some risks to the baby if a woman gets malaria during pregnancy?

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who report risks (unprompted) to the baby if a woman gets malaria during pregnancy by type of risk

Risk	Kebbi		Sokoto		Zamfara		Total		P
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	Val
Fetal death	50.9	46.6	13.9	25.1	61.0	34.8	48.7	35.6	**.003**
Premature birth	44.1	23.4	14.2	10.0	55.1	21.4	43.9	19.6	**.000**
Low birth weight	27.4	15.0	7.9	9.6	17.7	15.2	17.7	14.1	.223
Miscarriage	57.8	34.4	28.1	27.6	45.0	38.0	44.0	35.2	.058
Baby can be born with malaria	52.4	23.6	48.5	67.5	41.5	38.5	45.3	40.7	.330
Any correct risk	**96.3**	**79.7**	**78.7**	**90.5**	**93.8**	**92.2**	**91.1**	**89.0**	.434
Nothing	3.0	18.9	8.9	6.0	1.7	3.3	3.5	7.4	**.002**
N	1083	1065	1032	841	986	958	3101	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 2.2.3. Reported ways to prevent malaria in children

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting ways to prevent malaria in children

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Sleep under a mosquito net	95.2	84.4	91.1	92.1	96.1	95.2	94.8	92.2	.114
Avoid mosquito bites	77.6	70.8	43.5	56.6	62.9	47.3	61.9	54.4	.149
Take preventive medication	25.7	36.5	16.2	33.8	19.9	8.0	20.4	19.4	.774
Spray house with insecticide	34.7	27.1	11.8	35.8	27.2	28.0	25.5	29.3	.384
Cut grass around house	38.1	21.0	5.5	37.8	23.7	14.8	22.8	20.6	.541
Fill puddles/remove stagnant water	14.0	15.6	1.9	7.1	5.5	1.1	6.6	6.5	.513
Keep house surroundings clean	28.3	17.6	6.9	28.4	25.4	13.5	22.0	17.3	.172
Burn leaves	16.9	10.1	4.8	1.6	12.9	7.4	12.0	6.9	**.025**
Don't drink dirty water	12.8	3.4	1.9	10.9	1.1	0.9	3.8	3.4	.724
Don't eat bad fruit/unripe fruit	9.0	2.8	0.4	3.2	0.4	0.5	2.2	1.5	.305
Put screens on windows	6.9	3.1	0.7	0.1	13.6	0.5	9.4	1.0	**.000**
N	1,083	1,065	1,032	841	986	958	3,101	2,864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 2.2.4. Malaria-related beliefs and attitudes

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting malaria beliefs and attitudes

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Children's fevers almost always caused by malaria	68.8	85.4	70.8	72.9	63.2	87.2	66.2	84.1	**.000**
Blood test only way to know if malaria positive	80.2	79.1	63.9	74.5	87.8	73.7	81.0	75.1	**.020**
Even if a blood test is negative, I still worry that it's malaria	57.4	58.0	49.7	57.9	57.7	60.9	55.9	59.7	.531
Even if a blood test is negative, I still ask for malaria treatment	57.4	56.9	46.1	56.4	57.9	56.2	55.3	56.4	.950
Even if a blood test is negative, I trust the provider to find the cause	96.6	86.7	81.8	92.0	91.9	85.3	90.7	86.9	.281
Children under 5 should always sleep under a mosquito net	95.1	90.9	90.7	94.1	97.2	94.2	95.3	93.5	.406
Pregnant women should always sleep under a mosquito net	95.2	95.0	93.0	93.6	98.1	96.0	96.4	95.3	.245
When a pregnant woman gets malaria, it could affect the fetus	98.6	93.7	90.2	97.0	97.5	97.8	96.2	96.7	.595
Antimalarials work well for pregnant women	95.5	94.5	87.3	97.7	95.3	97.6	93.6	96.9	**.004**
N	1,083	1,065	1,032	841	986	958	3,101	2,864	

P val refers to significance test across the all three states combined of H₀: mean value for wives = mean for husbands

Table 2.2.5.Malaria diagnostic test awareness and beliefs

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting malaria diagnostic test awareness and beliefs

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Heard of types of malaria tests?									
Malaria RDT	56.5	64.6	51.6	58.8	68.7	47.7	62.4	53.7	.114
Blood smear	23.8	15.0	13.3	30.0	22.1	16.7	20.6	18.9	.592
Either RDT or smear	66.7	67.2	60.4	75.7	79.4	58.4	72.6	63.7	.077
Clinical symptoms	28.6	33.6	22.8	17.4	10.5	10.1	17.0	16.8	.941
Are there times when a malaria test could be wrong?	11.0	17.6	6.0	13.7	7.5	4.0	7.9	9.0	.514
Why might a malaria test be wrong?									
RDT unreliable	52.7	31.4	33.5	44.0	53.7	31.1	50.1	35.0	**.049**
Blood smear unreliable	12.4	18.0	10.7	42.8	35.3	21.5	24.5	26.2	.822
Provider unsure about using test	33.8	25.5	24.8	21.8	29.4	28.8	30.0	25.3	.480
Tested too early	23.8	10.9	1.5	1.7	3.7	6.2	9.3	6.9	.482
Caused by different parasite	15.0	3.7	3.0	5.0	4.1	2.9	7.2	3.9	.259
Took antimalarials	8.8	0.8	3.0	5.2	5.9	3.6	6.3	2.9	.098
Patient too young	10.0	0.8	6.2	0.0	0.0	3.1	4.0	1.2	.056
N	1,083	1,065	1,032	841	986	958	3,101	2,864	

P val refers to significance test across all three states combined of H_o: mean value for wives = mean for husbands

Table 2.2.6. Intentions for malaria prevention and treatment

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting intentions for malaria prevention and treatment

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	val
Likely to seek treatment for febrile child the same/next day	96.7	96.7	88.6	91.2	98.0	99.1	95.7	97.0	.333
Likely to get all children to sleep under a net	93.9	89.4	88.1	91.9	96.1	98.5	93.9	95.2	.484
Likely to ensure children take entire malaria course	98.0	92.8	88.7	91.0	97.2	97.2	95.5	95.0	.092
N	1,083	1,065	1,032	841	986	958	3,101	2,864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

2.3 Malaria Multivariate Modeling

2.3.1 Use of LLINs among pregnant women and children

Multivariate regressions were estimated for models examining the relationships between ideational factors and the use of LLINs the previous night among pregnant women and children under the age of two in households with at least one LLIN. Importantly, because we are interested in how couples' concordance and discordance in ideational factors affect engagement in key health behaviors, we focus on which members of a couple report those factors (i.e., neither, wife only, husband only, both). We hypothesize that positive concordance (both partners agree) on a behavior-promoting factor will lead to a higher likelihood of the desired behavior. Conversely, we hypothesize that discordance (partners disagree) or negative concordance (both partners disagree) on the factor will result in a lower likelihood of the behavior. The emphasis is on the idea that shared beliefs or attitudes (positive concordance) can potentially be more influential in shaping behaviors than individual beliefs or attitudes alone.

In much research, it has been shown that more accurate knowledge or more accurate risk perceptions increase the likelihood that a behavior will be engaged in. However, in these data, the vast majority of both husbands and wives have good knowledge of basic malaria issues and risks. Nearly all husbands and wives are aware that mosquitos transmit malaria and that sleeping under an insecticide treated net can prevent malaria. Injunctive norms indicating that pregnant women and children under age two should sleep under a net every night were also nearly universally held. While these findings are good for programming, lack of variation in these important indicators means that they cannot be included in regression models. Instead, we used other indicators of malaria knowledge, such as whether a respondent identified an incorrect cause of malaria or an incorrect prevention mechanism ( ). We also included a measure of trust in RDTs under the assumption that individuals with more accurate knowledge would be more likely to trust RDTs.

Attitudes toward malaria testing: We use attitudes toward malaria testing as a measure of malaria risk perceptions and confidence in medical care. Specifically, we hypothesize that wives and husbands who agree that a blood test is the only way to diagnose malaria or that do not worry about malaria if a blood test is negative, both reflective of more accurate malaria knowledge, will be more likely to engage in the recommended behavior of sleeping under a net.

The results suggest a nuanced relationship between attitudes toward medical testing for malaria and preventative practices. Whether a couple, or just one partner, believes that a blood test is the only way to diagnose malaria does not seem to significantly affect their behavior toward using LLINs. When this belief is held only by the wife, the adjusted probability of LLIN use is 84.5% among pregnant women (p=0.279) and 82.0% for children under two (p=0.679). When this belief is held only by the husband, the corresponding probabilities are 83.3% for pregnant women (p=0.683) and 83.0% for children under two (p=0.656). When both partners hold this belief, the probabilities are 82.7% for pregnant women (p=0.643) and 82.0% for children under two (p=0.679).

When it comes to anxiety over potential malaria infection, even after a negative blood test, this does not appear to motivate LLIN usage significantly. For pregnant women, when only the wife worries, the probability of LLIN use is 80.7% (p=0.784). The probability rises slightly to 83.9% (p=0.092) when both partners share this worry. For children under two, the probability of LLIN use is 81.2% when only the wife worries (p=0.786) and increases to 86.1% when both partners share this worry, although this increase is not statistically significant (p=0.090).

These results indicate that worries about malaria, even when shared by both partners, may not necessarily translate into effective preventative measures, as none of these factors were statistically significant at the p<0.05 level. The data highlights a gap between individuals' fears or anxieties about malaria and their preventive actions, underlining that emotional responses to the disease alone may not be a reliable driver of effective prevention behaviors.

Knowledge of malaria cause and prevention: The data reveal fascinating insights into how understanding or misconceptions about what causes or prevents malaria can impact LLIN usage. For pregnant women, an unexpected trend emerged; when both husband and wife identify an incorrect cause of malaria, the use of LLINs seems to increase. Hence, contrary to expectations, incorrect knowledge does not always lead to poor practices.

It might seem counterintuitive at first that households where both husbands and wives identify an incorrect cause of malaria see higher use of bed nets. A number of possible explanations may exist:

1. **Overcompensation due to misunderstanding:** Those who hold incorrect beliefs about the cause of malaria might be more fearful or concerned about the disease due to their misunderstanding. This could lead to a sort of overcompensation, where they use nets more frequently because they believe the risk to be higher than it actually is.

2. **General health consciousness:** Even if their understanding of the disease is flawed, the fact that couples are thinking about malaria and taking some preventive measure might suggest a general consciousness about health and disease prevention. This broader mindset might motivate a higher use of bed nets, even if couples' specific knowledge about malaria is incorrect.

3. **Misconceptions leading to caution:** Incorrect beliefs about the causes of malaria could lead to a heightened sense of caution. For instance, if a couple believes that malaria can be caused by factors beyond mosquito bites, they might choose to use bed nets as a 'catch-all' preventive measure.

4. **Effects of education and messaging:** Sometimes, educational messaging about disease prevention can be effective even if the precise details aren't fully understood or are misunderstood. For instance, a household might remember and act on the message "use bed nets to prevent malaria" even if they're unclear or mistaken about the exact causes of malaria

In an apparent paradox, when considering misconceptions about malaria prevention mechanisms, the use of LLINs is noticeably lower when wives hold incorrect beliefs. In the case of pregnant women, when the wife identifies an incorrect malaria prevention mechanism, the use of LLINs drops from an estimated 85.1% (when neither the husband nor wife identifies an incorrect mechanism) to approximately 81.8%, representing approximately 3.3 percentage point decrease, which, in terms of relative proportions, is approximately a 4% drop in LLIN usage. For children under two, the drop is from 82.5% to 80.1%, a 2.4 percentage point, or nearly a 3% relative decrease.

Again, possible explanations require a nuanced view of couples' understanding of malaria. If, for example, an individual or household believes that a certain action (which is actually ineffective) can prevent malaria, they might forego other, more effective prevention methods like bed net usage. In other words, their misunderstanding about how to prevent malaria directly influences their preventive practices and can lead to lower use of bed nets.

For both malaria causes and malaria prevention, knowledge or beliefs are impacting behavior, but the direction of the impact depends on the specifics of the misinformation. This underlines the importance of

comprehensive health education that addresses both the causes and prevention methods for diseases like malaria. Education efforts should aim not only to provide correct information, but also to correct misconceptions that might lead to harmful behaviors or neglect of effective preventive measures. Hence, while correct knowledge is always the goal, these findings highlight how both correct and incorrect knowledge can play a role in shaping health behaviors. They also underscore the importance of understanding people's current beliefs and misconceptions when designing health education or intervention programs.

In summary, these findings uncover a complex relationship between knowledge, attitudes, and behaviours related to malaria prevention. While it may be tempting to assume that correct knowledge and positive attitudes would invariably lead to appropriate preventive practices, the data challenges this notion. It underlines the necessity for carefully designed, targeted health education and communication strategies that not only rectify misconceptions but also foster an accurate understanding of malaria transmission and prevention.

We also note that joint beliefs and attitudes are also important. In situations where both partners share worry about malaria or have misconceptions about its cause, the probability of LLIN usage increases. However, this joint effect is not observed across all factors. For instance, shared knowledge about diagnostic methods (such as awareness of Malaria RDT) or belief that a blood test is the only way to diagnose malaria does not significantly increase LLIN use.

These findings also emphasize the critical role of wives' beliefs in the employment of malaria preventative practices. More specifically, when examining misconceptions about prevention mechanisms, the likelihood of LLIN use is 77.3% when the wife alone holds incorrect beliefs (p=0.003), compared to 81.7% when the husband alone holds such beliefs (p=0.194), and 83.9% when both partners hold correct beliefs (p=0.510). This pattern implies that correcting misconceptions held particularly by wives could lead to an increased probability of LLIN use and, thus, enhanced malaria prevention.

In contrast, the influence of husbands' knowledge and attitudes is less distinct. In the data, there are no scenarios where the husbands' knowledge or attitudes alone significantly affect LLIN usage. For instance, when the husband alone identifies an incorrect cause of malaria, the likelihood of LLIN usage is 83.7% (p=0.102), not significantly different from the baseline. Similarly, when the husband alone holds misconceptions about prevention mechanisms, the probability of LLIN use is 81.7% (p=0.194), again not significantly diverging from when both partners hold correct beliefs.

These results suggest a potentially greater influence of wives' beliefs and knowledge on household practices related to malaria prevention, underscoring the importance of targeted health education and interventions among women for effective malaria prevention.

Furthermore, it emphasizes the critical role of promoting the use of LLINs effectively. The data also highlights the significance of considering both women's and men's beliefs and understandings, as their perspectives can influence preventive practices within the household differently. This approach underscores the importance of a comprehensive understanding of socio-cultural factors in shaping effective health interventions.

Other factors to note include the following:

Mother's age: For both pregnant women and children under two, there seems to be a trend with the mother's age, although not statistically significant. For pregnant women, the likelihood of sleeping under a net appears to decrease with the increase in mother's age. Conversely, for children under two, the older the mother, the less likely they are to sleep under a net, with the lowest probability (74.4%) in the 35–49 age category. This

could suggest that age-related factors such as experience, perceptions of risk, or other socio-demographic variables associated with age may play a role in the use of LLINs.

Husband's education: The husband's education level, although not significant, appears to influence the usage of LLINs. In particular, for pregnant women, those with husbands who have received Islamic education are more likely to sleep under a net. While for children under two, those with husbands who have primary education are most likely to sleep under a net. This could hint at the role of the husband's knowledge and attitudes in the household's health practices, reinforcing the importance of including men in health education and promotion efforts.

Wealth quintile: While wealth doesn't show a consistent significant effect across both groups, it does suggest some trends. Among pregnant women, those from the lowest wealth quintile are most likely to use an LLIN, while among children under two, those from the lowest and fourth wealth quintiles have the highest usage. This could suggest that economic factors might interact with other variables to influence LLIN usage.

State: The state where the respondents live also seems to be a factor. For instance, pregnant women in Zamfara are considerably more likely to sleep under an LLIN compared to those in Kebbi or Sokoto. Similarly, among children under two, those in Zamfara have the highest LLIN usage. Although this is only significant in the case of children under two, it could point toward geographic or regional differences in malaria risk perceptions, health infrastructure, or local health campaigns.

Community events and CV household visits: Engagement with community events and household visits by CVs show a suggestive trend. Among pregnant women, those visited by a CV have a higher probability of sleeping under an LLIN. Among children under two, those whose households haven't attended any community event are more likely to sleep under an LLIN. While not significant, these trends hint at the role of community engagement and outreach in health behaviors.

Table 2.3.1. Logistic regression: Use of LLIN among pregnant women in households with at least one LLIN

	Odds ratio	[95% conf.	interval]	P>t	Pr(Y=1)
Mother's age					
15–24 years	1.000				63.3%
25–34 years	1.426	0.476	4.275	0.520	69.5%
35–49 years	0.806	0.264	2.465	0.701	59.3%
Woman's education					
None	1.000				69.5%
Primary	2.424	0.648	9.060	0.184	82.2%
Secondary or higher	3.955	1.562	10.009	**0.004**	87.4%
Islamic	0.280	0.021	3.769	0.331	46.2%
Husband's education					
None	1.000				60.7%
Primary	0.966	0.179	5.206	0.968	60.1%
Secondary	0.370	0.085	1.608	0.181	43.0%
Tertiary	0.973	0.235	4.022	0.969	60.2%
Islamic	2.076	0.238	18.110	0.502	72.4%
Wealth quintile					
Lowest	1.000				81.4%
Second	0.374	0.126	1.109	0.075	66.8%
Middle	0.242	0.089	0.656	**0.006**	58.9%
Fourth	0.440	0.100	1.931	0.270	69.5%
Highest	0.287	0.078	1.056	0.060	62.1%
State					
Kebbi	1.000				44.9%
Sokoto	0.850	0.125	5.790	0.866	41.5%
Zamfara	4.888	0.813	29.367	0.082	76.1%
Any community event					
No	1.000				65.4%
Yes	1.019	0.127	8.182	0.986	65.7%
Any CV household visit					
No	1.000				63.3%
Yes	2.545	0.731	8.860	0.139	78.1%
Any malaria jingle					
No	1.000				70.6%
Yes	0.556	0.253	1.223	0.141	60.4%
Blood test is the only way to know if a fever is caused by malaria					
Neither	1.000				65.5%
Wife only	1.061	0.182	6.172	0.947	66.6%
Husband only	1.438	0.286	7.230	0.654	71.6%
Both agree	0.906	0.221	3.709	0.889	63.8%
Even if a blood test is negative, I still worry that it is malaria					
Neither	1.000				72.0%
Wife only	0.680	0.140	3.306	0.627	65.5%

	Odds ratio	[95% conf.	interval]	P>t	Pr(Y=1)
Husband only	0.527	0.195	1.428	0.203	60.9%
Both agree	0.697	0.252	1.929	0.480	65.9%
Identifies an incorrect cause of malaria					
Neither identifies incorrect cause	1.000				61.9%
Wife only identifies	0.795	0.382	1.658	0.534	57.7%
Husband only identifies	3.793	0.695	20.705	0.121	82.1%
Both identify incorrect cause	14.880	0.365	606.812	0.150	93.5%
Identifies an incorrect malaria prevention mechanism					
Neither identifies incorrect mechanism	1.000				66.7%
Wife only identifies	0.309	0.097	0.990	**0.048**	44.2%
Husband only identifies	1.222	0.359	4.159	0.744	70.2%
Both identify incorrect mechanism	0.061	0.002	1.626	0.093	17.1%
Heard of malaria RDT					
Neither	1.000				65.5%
Wife only	1.372	0.403	4.672	0.607	70.8%
Husband only	0.706	0.199	2.507	0.583	59.2%
Both agree	0.869	0.203	3.714	0.847	63.0%
Constant	3.690	3.690	50.215	0.320	65.4%
Obs	698				
Design df	53				
F(29,158)	5.99				
Prob>F	0.000				

Table 2.3.2 Logistic regression: Use of LLIN among pregnant women in households with at least one LLIN

	Odds ratio	[95% conf.	interval]	P>t	Pr(Y=1)
Mother's age					
15–24 years	1.000				82.7%
25–34 years	1.360	0.771	2.397	0.284	86.2%
35–49 years	0.566	0.304	1.054	**0.072**	74.4%
Woman's education					
None	1.000				83.1%
Primary	0.875	0.421	1.817	0.717	81.4%
Secondary or higher	0.856	0.429	1.708	0.656	81.1%
Islamic	0.989	0.280	3.489	0.986	83.0%
Husband's education					
None	1.000				83.8%
Primary	1.407	0.635	3.122	0.396	87.6%
Secondary	0.788	0.359	1.727	0.547	80.8%
Tertiary	1.177	0.479	2.894	0.719	85.7%
Islamic	0.776	0.242	2.494	0.667	80.6%
Wealth quintile					
Lowest	1.000				84.8%
Second	0.620	0.333	1.151	0.128	78.6%
Middle	0.827	0.370	1.845	0.638	82.5%
Fourth	1.018	0.472	2.198	0.962	85.1%
Highest	0.780	0.348	1.749	0.541	81.8%
State					
Kebbi	1.000				65.0%
Sokoto	1.074	0.550	2.099	0.833	66.4%
Zamfara	5.072	2.785	9.236	**0.000**	89.6%
Any community event					
No	1.000				83.1%
Yes	0.527	0.290	0.959	**0.036**	73.8%
Any CV household visit					
No	1.000				81.7%
Yes	1.680	0.900	3.136	0.102	87.6%
Any malaria jingle					
No	1.000				84.1%
Yes	0.802	0.576	1.119	0.192	81.3%
Blood test is the only way to know if a fever is caused by malaria					
Neither	1.000				79.8%
Wife only	1.440	0.798	2.599	0.223	84.5%
Husband only	1.279	0.429	3.815	0.656	83.0%
Both agree	1.177	0.539	2.569	0.679	82.0%
Even if a blood test is negative, I still worry that it is malaria					
Neither	1.000				80.1%
Wife only	1.089	0.583	2.035	0.786	81.2%

Husband only	1.027	0.532	1.983	0.937	80.4%
Both agree	1.627	0.925	2.864	**0.090**	86.1%
Identifies an incorrect cause of malaria					
Neither identifies incorrect cause	1.000				83.1%
Wife only identifies	0.831	0.495	1.393	0.477	80.7%
Husband only identifies	1.231	0.700	2.164	0.467	85.5%
Both identify incorrect cause	0.603	0.175	2.078	0.419	76.0%
Identifies an incorrect malaria prevention mechanism					
Neither identifies incorrect mechanism	1.000				82.5%
Wife only identifies	0.830	0.434	1.586	0.568	80.1%
Husband only identifies	1.568	0.851	2.890	0.147	87.6%
Both identify incorrect mechanism	0.593	0.189	1.866	0.367	75.0%
Heard of malaria RDT					
Neither	1.000				79.4%
Wife only	1.317	0.733	2.366	0.353	83.1%
Husband only	1.396	0.716	2.721	0.323	83.8%
Both agree	1.347	0.704	2.575	0.364	83.4%
Constant	1.571	0.500	4.937	0.435	82.6%
Obs	1856				
Design df	83				
F(29,158)	3.7				
Prob>F	0.000				

2.4. Treatment of child fever: multivariate results

We estimated multivariate models for four outcomes related to treatment for a fever in a child under the age of two years: whether the child received prompt treatment on the same day or next day, whether the child received treatment from any provider (formal or informal) for the fever, whether the child had a malaria blood test, and whether the child was given ACT (although we do not have information on whether the child tested positive for malaria.

Decision-making: Overall, across all four outcomes, the highest probabilities occur when both the wife and husband jointly decide on seeking care. This pattern is most striking and statistically significant for the child receiving a blood test for malaria. The lowest probabilities generally occur when the wife makes the decision, especially notable for the child receiving a blood test for malaria. In terms of seeking prompt treatment for fever within 24–48 hours, the adjusted probability is highest (57.4%) when both the wife and husband jointly decide to seek care. However, the differences are not statistically significant (p>0.05) compared to when the decision is mainly the wife's (52.2%) or mainly the husband's (51.2%).

For seeking care from any provider, the pattern is similar with the highest adjusted probability observed when both decide together (82.9%). Again, the statistical significance of this difference is not confirmed (p>0.05). In the case of a child receiving a blood test for malaria, the adjusted probability is again highest when the decision is made jointly (32.1%), but this time the difference is statistically significant (p<0.05) compared to when the decision is mainly the wife's (11.3%). Interestingly, even when the decision is mainly the husband's, the probability is notably higher (19.9%) than when the wife mainly decides, though the difference is not statistically significant. Lastly, for the child being given ACT for malaria, the highest adjusted probability is also when both decide together (33.5%), but this is not statistically significant.

Even though most results are not statistically significant, the patterns suggest that joint decision-making is associated with better health-seeking behaviors and outcomes. This may be due to multiple factors such as increased discussion, negotiation, and shared understanding of the child's health needs. Moreover, the significant result for joint decision making leading to increased likelihood of blood tests for malaria points to the potential value of shared decision-making in improving diagnostic procedures for child illness. As usual, caution should be taken to not over dramatize the results or infer causality. It may not be joint decision-making that leads to better outcomes; it may also be that couples who make joint decisions are different from couples that do not in ways that may also affect what they do for their children's health.

Attitudes: Because nearly all husbands and wives have correct knowledge of malaria transmission and prevention mechanisms, we focus on attitudes toward malaria tests and trust in health providers as measures of their knowledge. In this respect, it appears that concordance between husband and wife does matter in certain circumstances, particularly with regards to the belief that a blood test is the only way to know if a child has malaria. However, the attitudes of individual partners also have significant effects.

For the prompt treatment of fever within 24–48 hours, the highest adjusted probability is when the wife only agrees with this statement (56.8%), but this is not statistically significant. The highest probability for seeking care from any provider is also when the wife only agrees (81.0%), again not statistically significant. However, when it comes to the child receiving a blood test for malaria, there's a significant increase in the adjusted probability when both agree (27.6%, p<0.05). The probability of the child being given ACT for malaria is highest when both agree (34.2%), but not statistically significant.

For prompt treatment within 24–48 hours and receiving a blood test for malaria, the highest probabilities are observed when the husband only agrees (57.0%, 26.2% respectively), but neither of these differences are statistically significant. However, in the case of seeking care from any provider, the husband's agreement significantly increases the probability to 84.0% (p<0.05). For the child being given ACT for malaria, the highest probability is observed when neither agree (37.5%), which seems illogical.

For the prompt treatment of fever within 24–48 hours and seeking care from any provider, the highest adjusted probabilities are when the husband only agrees (65.1%, 74.0% respectively), with the difference in prompt treatment approaching statistical significance (p=0.097). Interestingly, the probability of the child receiving a blood test for malaria is highest when the wife only agrees (29.4%). For the child being given ACT for malaria, the highest adjusted probability is also observed when the husband only agrees (39.3%) and it's statistically significant (p<0.05).

These findings suggest that husbands' attitudes might play a significant role in malaria care-seeking behaviors and treatment outcomes. When the husband is the only one worrying about malaria despite a negative blood test, the likelihood of seeking any care significantly increases. Similarly, when the husband alone trusts the provider despite a negative blood test, there is a significant increase in the probability of the child being given ACT for malaria.

Norms: Husbands and wives were asked to agree or disagree that health facilities in the community have necessary treatments for child illnesses. Presumably, couples who agree with the statement will be more likely to get appropriate treatment.

Positive concordance between husband and wife matters most significantly when it comes to the child being given ACT for malaria. In this case, the probability of the child receiving ACT is 33.4% (p<0.05) relative to 18.3% if neither agree with the statement and 28.5% (p=0.252) and 25.4% (p=0.256) if the husband alone or the wife alone respectively agree with the statement. A child is also more likely to receive a malaria blood test (29.6% versus 17.5%, p=0.113) if the couple both agree with the statement.

However, the husband's agreement seems to be associated with the highest probabilities for prompt treatment within 24–48 hours and seeking care from any provider. If the husband agrees with statement, a child with fever is almost 10 percentage points more likely to get prompt treatment (65.2% versus 55.8%, p=0.213). A similar effect size is evident for treatment seeking from any provider. If the husband believes health facilities are well-stocked, the likelihood of a child being taken for care increases from 77.6% if neither agrees to 88.1% (p=0.119), although this is not statistically significant. The wife's agreement does not lead to the highest probabilities for any of the four outcomes.

These patterns might suggest that when both parents agree that the local health facilities are capable, they are more likely to follow through with treatments such as ACT for malaria. On the other hand, the husband's belief alone might influence the initial decision to seek care and do it promptly.

Self-efficacy: The wife's confidence in her ability to convince her husband to seek care for an ill child is positively associated with all the outcomes, although only two are statistically significant. significantly improves the likelihood of prompt treatment within 24–48 hours and the likelihood of seeking care from any provider. When the wife feels confident in her ability to convince her husband to seek care, the probability of the child receiving prompt treatment within 24–48 hours significantly increases from 28.7% to 55.8% (p<0.01). Similarly, the probability of seeking care from any provider is significantly higher when a wife feels confident (80.3%) compared to when she doesn't (45.5%) and this difference is statistically significant (p<0.001).

While the likelihood of a child receiving a blood test for malaria is higher when the woman is confident (26.3%) compared to when she is not (21.5%), this difference is not statistically significant (p=0.537). Similarly, the probability of the child being given ACT for malaria is higher when the woman is confident (31.5%) compared to when she is not (22.3%), but this difference is also not statistically significant (p=0.454).

The fact that the most substantial and statistically significant differences are seen in the initial decision to seek care and do so promptly suggests that woman's confidence might be particularly influential in these early stages of response to a child's illness.

Care-seeking discussions: A wife's report of a discussion about care-seeking seems to be associated with more positive outcomes for prompt treatment. The likelihood of prompt treatment appears to be higher when only the wife reports a discussion (66.1%, p=0.048), suggesting a possible positive impact of the wife's active

involvement in the discussion. When both partners report the discussion, the rate is slightly higher (57.2%) than when no one reports a discussion (49.2%), although the difference isn't statistically significant (p=0.407). When only the husband reports a discussion, the rate is lowest (38.6%), but this difference is also not statistically significant (p=0.159).

In contrast, the husband's sole reporting seems to be associated with lower rates of seeking care from any provider and receiving ACT for malaria. When only the husband reports a discussion, the likelihood of seeking treatment is 68.6%, which is significantly lower than when no one reports a discussion (85.6%, p=0.003). No significant difference is observed when either the wife alone or both partners report the discussion. There is also a statistically significant lower likelihood of a child receiving ACT when only the husband reports a discussion (24.3%, p=0.015) compared to when no one reports a discussion (43.4%).

Concordance in reporting does not seem to be associated with statistically significantly higher probabilities of positive outcomes. This may indicate that the quality or content of the discussion, and not merely its occurrence, could be a critical factor influencing these health behaviors.

Gender equality: A wife's gender equality attitudes is positively related to the likelihood of seeking prompt treatment for a child with fever and the decision to seek care from any provider. Specifically, when the index is at 0 (most traditional attitudes), the probability of prompt treatment is only 2.5%, but this number jumps significantly to 41.7% when the index is at 1, showing a significant difference (p<0.000). The trend continues to increase, with the highest likelihood of prompt treatment (62.3) observed when the wife's gender equality index is at 4 (most gender equal attitudes). Similar to the previous outcome, the likelihood of seeking care from any provider increases with increasing values of the gender equality index. When the wife's index is at 0, the likelihood is 26.1%. This number dramatically rises to 83.0% when the index is at 1 (p<0.000), before it stabilizes around ~80% as the index increases. No clear pattern emerges for the other two outcomes.

This suggests that gender equal attitudes may play an important role in health-seeking behavior and decision-making within the family. In contrast, these attitudes do not seem to have a significant impact on whether the child receives a blood test for malaria or is given Artemisinin-based combination therapy. This could suggest that while gender equality attitudes can influence initial care-seeking decisions, they may not impact specific treatment choices, which could be more influenced by external factors such as provider advice, availability of services, or cultural beliefs about specific treatments.

Influencers: Who influences treatment seeking does not appear to have a significant impact on the likelihood of prompt treatment of fever, seeking care from any provider, or receiving ACT for malaria. However, the involvement of the husband is associated with a significantly higher likelihood of the child receiving a blood test for malaria. When the husband influences the treatment seeking (27.0% when he does, p=0.036). This is higher than the probability when the husband does not influence (12.5%). There is no significant difference when the mother or mother-in-law influences treatment seeking for any of the outcomes.

Mother's age: In the case of seeking prompt treatment within 24–48 hours for a child's fever, there is a statistically significant increase in the likelihood as the mother's age increases. The probabilities for different age groups are as follows: 48.4% for 15–24 years, 57.6% for 25–34 years (p=0.035), and 57.8% for 35–49 years (p=0.050). The mother's age does not seem to significantly influence the chances of care being sought from any provider, the child receiving a blood test for malaria, or the child being given ACT for malaria.

Woman's education: The level of the woman's education does not show a statistically significant impact on any of the outcomes. The highest probability of prompt treatment (67.4%) is seen for women with secondary or higher education, though this result isn't statistically significant (p=0.080).

Husband's education: The education level of the husband appears to have a significant impact on the promptness of treatment. When the husband has primary education, the probability of seeking prompt treatment increases to 59.7% (p=0.031), compared to those husbands with no education. However, higher levels of education (secondary and tertiary) do not result in a significant increase in the probability. The husband's education does

not seem to significantly influence the other outcomes (care from any provider, blood test for malaria, ACT for malaria).

Wealth quintile: Wealth quintile shows a statistically significant pattern with the probability of seeking prompt treatment. As the wealth quintile increases from lowest to fourth, the probability of seeking prompt treatment increases (from 39.5% to 62.0%, p=0.002). But the trend does not continue with the highest wealth quintile, which shows a slightly lower probability (56.1%, p=0.022). Wealth quintile doesn't seem to significantly impact the other outcomes.

In summary, mother's age and wealth quintile seem to be important covariates in influencing the likelihood of prompt treatment. Education, both of the woman and husband, does not appear to have a statistically significant impact on the child's fever-related outcomes.

Table 2.4.1. Predicted Likelihoods of Treatment Seeking Outcomes for Children with Fever

	Prompt treatment of fever within 24–48 hours		Sought care from any provider		Child received a blood test for malaria		Child given ACT for malaria	
	Pr(Y=1)	P>t	Pr(Y=1)	P>t	Pr(Y=1)	P>t	Pr(Y=1)	P>t
Mother's Age								
15–24 years	48.4%		78.7%		30.0%		35.7%	
25–34 years	57.6%	**0.035**	81.4%	0.402	24.9%	0.187	29.1%	0.199
35–49 years	57.8%	**0.050**	74.5%	0.274	23.9%	0.349	29.6%	0.228
Woman's education								
None	52.6%		78.2%		24.9%		28.7%	
Primary	56.8%	0.654	81.3%	0.609	33.2%	0.291	31.2%	0.773
Secondary or higher	67.4%	0.080	82.5%	0.478	31.4%	0.534	28.0%	0.938
Islamic	52.2%	0.945	77.8%	0.919	24.2%	0.897	33.3%	0.468
Husband's education								
None	42.2%		80.4%		23.5%		35.8%	
Primary	59.7%	**0.031**	76.8%	0.658	29.5%	0.456	39.2%	0.618
Secondary	56.4%	**0.084**	86.6%	0.318	27.5%	0.590	32.6%	0.622
Tertiary	57.0%	0.161	74.2%	0.525	22.1%	0.877	33.5%	0.789
Islamic	55.5%	**0.039**	76.4%	0.510	27.2%	0.554	26.7%	0.108
Wealth quintile								
Lowest	39.5%		79.6%		22.9%		27.9%	
Second	53.6%	**0.050**	82.3%	0.617	31.7%	0.147	33.5%	0.340
Middle	57.2%	**0.012**	78.2%	0.811	29.0%	0.238	33.1%	0.469
Fourth	62.0%	**0.002**	79.7%	0.986	26.0%	0.679	29.5%	0.848
Highest	56.1%	**0.022**	74.9%	0.489	22.3%	0.938	31.6%	0.657
Women's equality index								
0	2.5%		26.1%		47.6%		37.8%	
1	41.7%	**0.000**	83.0%	**0.000**	34.8%	0.611	27.4%	0.614
2	55.4%	**0.000**	78.6%	**0.000**	24.0%	0.349	34.1%	0.865
3	53.4%	**0.000**	81.5%	**0.000**	28.7%	0.458	22.8%	0.512
4	62.3%	**0.000**	78.8%	**0.000**	26.7%	0.407	32.1%	0.801
Exposure to any Breakthrough ACTION interventions								
Neither	67.9%		82.0%		25.8%		29.6%	
Wife only	65.8%	0.698	81.7%	0.923	34.5%	0.130	35.8%	0.389
Husband only	53.1%	**0.044**	82.1%	0.994	35.5%	0.071	31.1%	0.863
Both	47.7%	**0.000**	75.6%	0.131	21.7%	0.517	30.4%	0.917
Whose decision is it to seek care?								
Mainly my decision	52.2%		73.1%		11.3%		26.1%	
Mainly my partner's decision	51.2%	0.895	74.3%	0.884	19.9%	0.259	28.7%	0.726
Both decide together	57.4%	0.502	82.9%	0.219	32.1%	**0.014**	33.5%	0.299
Influencers								
Partner								
No	51.8%		70.5%		12.5%		25.9%	
Yes	55.0%	0.759	79.6%	0.246	27.0%	**0.036**	31.6%	0.558
Mother-in-Law								
No	55.1%		79.3%		25.9%		30.9%	
Yes	51.5%	0.533	74.4%	0.359	29.5%	0.625	34.1%	0.617
Mother								

	Prompt treatment of fever within 24–48 hours		Sought care from any provider		Child received a blood test for malaria		Child given ACT for malaria	
	Pr(Y=1)	P>t	Pr(Y=1)	P>t	Pr(Y=1)	P>t	Pr(Y=1)	P>t
No	54.7%		78.5%		26.5%		31.1%	
Yes	55.3%	0.942	83.6%	0.385	22.2%	0.610	32.4%	0.903
Discussion of care seeking								
No one reports discussion	49.2%		85.6%		33.2%		43.4%	
Wife only	66.1%	**0.048**	85.4%	0.956	32.8%	0.966	35.9%	0.351
Husband only	38.6%	0.159	68.6%	**0.003**	22.9%	0.189	24.3%	**0.015**
Both report discussion	57.2%	0.407	78.1%	0.160	23.1%	0.217	29.1%	0.057
Blood test only way to know if malaria positive								
Neither agree	50.5%		73.0%		11.5%		20.1%	
Wife only agrees	56.8%	0.520	81.0%	0.207	26.5%	**0.049**	29.1%	0.364
Husband only agrees	51.1%	0.937	80.0%	0.358	25.1%	0.119	26.0%	0.521
Both agree	55.5%	0.593	78.3%	0.488	27.6%	0.040	34.2%	0.101
Even if blood test negative I still worry about malaria								
Neither agree	49.8%		68.6%		24.1%		37.5%	
Wife only agrees	52.3%	0.704	71.1%	0.661	21.0%	0.635	33.5%	0.549
Husband only agrees	57.0%	0.290	84.0%	**0.009**	26.2%	0.721	28.1%	0.118
Both agree	56.5%	0.414	82.9%	**0.032**	29.6%	0.312	30.1%	0.344
Even if blood test negative I trust the provider to find the cause								
Neither agree	36.9%		73.8%				8.1%	
Wife only agrees	62.5%	0.104	86.3%	0.413	29.4%		35.8%	**0.013**
Husband only agrees	65.1%	0.097	74.0%	0.988	22.7%		39.3%	**0.007**
Both agree	53.1%	0.294	78.2%	0.776	26.2%		30.3%	**0.019**
Facilities in my community often have needed treatment								
Neither agree	55.8%		77.6%		17.5%		18.3%	
Wife only agrees	53.1%	0.774	68.3%	0.157	20.1%	0.709	25.4%	0.256
Husband only agrees	65.2%	0.213	88.1%	0.119	11.9%	0.479	28.5%	0.252
Both agree	53.6%	0.776	78.9%	0.831	29.6%	0.113	33.4%	**0.036**
Confident to convince husband to seek care when child is sick in general								
No	28.7%		45.5%		21.5%		22.3%	
Yes	55.8%	**0.006**	80.3%	**0.000**	26.3%	0.537	31.5%	0.454
State								
Kebbi	59.2%		72.2%		12.7%		23.1%	
Sokoto	56.5%	0.704	84.0%	**0.043**	27.6%	**0.026**	32.4%	0.230
Zamfara	52.1%	0.342	78.5%	0.315	31.9%	**0.001**	34.1%	0.210
Constant								
Obs	822		822		811		822	
Design df	80		80		80		80	
F(43,38)	2.68		4.96		5.43		1.45	
Prob>F	0.001		0.000		0.000		0.123	

Chapter 3. Family planning

Contraceptive knowledge

More than nine out of ten respondents—both husbands and wives—were able to identify at least one modern contraceptive method (Table 3.1). While Breakthrough ACTION/Nigeria did not specifically target Zamfara with FP related messages, there was evidence of high levels of exposure to Breakthrough ACTION/Nigeria radio programming with *Albisihirin Ku!* branding, likely reflective of spillover exposure from Sokoto. Perhaps relatedly, awareness of modern contraception was higher in Zamfara, than in the integrated state of Kebbi. In general, a higher percentage of wives than husbands knew of implants, injectables and pills, except for Sokoto, where husbands were more likely to know about injectables (wives: 93%, husbands: 97%) and oral contraception (wives: 75%, husbands: 86%). More than 80% of husbands across all three states were aware of male condoms, considerably more than wives (43%).

Contraceptive use and methods

Across all three states, husbands and wives differed slightly in reporting about current use of a method of contraception, although the differences were not statistically significant. Similar proportions of wives and husbands reported using current modern contraception; 21% of husbands said the couple was using modern contraception relative to 16% of women (Table 3.2). For both men and women, injectables were the most cited method that the couple was using. For both men and women, the main reason for using contraception was to delay childbearing, although husbands were much more likely to cite this reason (wives: 65%, husbands: 92%) (Table 3.3). Only 11% of husbands and wives wanted to stop childbearing. For both men and women, the main reason for not using contraception was because such decisions are "Up to God" (wives: 26%, husbands: 35%) (Table 3.4.4). In terms of future intentions, only a minority of couples who were not currently using contraception stated that they intend to begin using contraception in the next 6 months, though many more wives (17%) than husbands (9%) had these intentions (Table 3.5). Among both husbands and wives, intentions to begin using contraception were higher in Zamfara State. Among couples who were currently using contraception, nearly nine out of ten couples said that they intended to continue using (wives: 88%, husbands: 93%). Again, intentions to continue were higher among couples in Zamfara than in either integrated state.

Most respondents, approximately 87% of wives and 81% of husbands, were able to identify at least one benefit of using contraception for existing children and for women, although generally wives were better able than husbands to cite benefits (Table 3.7). The most common benefit to future children, cited by both husbands and wives, was better growth (wives: 72%, husbands: 58%), while the most cited benefit for mothers was to rest after birth (wives: 76%, husbands: 65%)

Contraceptive beliefs, attitudes, and myths

Less than half of wives and husbands (wives: 47%, husbands: 38%) approve of contraception for spacing births but the majority of couples (wives: 73%, husbands 64%) believe that using contraception leads to a better quality of life and that it is important for couples to discuss contraception (wives 77%, husbands: 70%) (Table 3.8). Approval was higher in Zamfara than in the other two states. The majority of both wives (67%) and husbands (59%) believe that religious leaders should speak about contraception. Norms of perceived use differed between

husbands and wives; wives were 21 pp more likely than husbands to say that most couples in the community use contraception (wives: 67%, husbands: 46%).

Only a minority of both husbands and wives believe common myths about contraception, including that contraception can make a woman permanently infertile (wives: 24%, husbands: 32%), that they can cause cancer (wives: 19%, husbands: 24%), or that contraception can make a woman promiscuous (wives: 19%, husbands: 23%). Nonetheless, while belief in these myths is low, it is not uncommon. Understanding that women's bodies are not ready for childbirth until the age of 18 was low (wives: 37%, husbands: 26%).

Spousal communication and decision-making

While the majority of both husbands (70%) and wives (77%) believed that it is important for husbands and wives to discuss contraception, such discussions appear to be rare. Only 9% of wives and 16% of husbands reported that they had ever discussed the number of children to have with their partner, and only about a quarter of couples reported that they had ever discussed using modern contraception (Table 3.9). Common topics of discussion were about which method to use (wives: 74%, husbands 69%) or spacing (wives: 69%, husbands: 48%) but less so about limiting or side effects.

In terms of decision-making, it was most reported that couples decide together about use (wives: 50%, husbands: 56%) (Table 3.10). Only 4% of husbands said that it was mainly their partner's decision. Joint decision-making was more common in both Kebbi and Zamfara than in Sokoto. In slight contradiction to the prevalence of joint decision making, more than three quarters of husbands reported that no one else (including the wife) influences his decisions about contraception versus only 19% of wives who said that no one else influences their decision (Table 3.11). As verification of this pattern, 79% of wives said that her spouse influences her contraceptive decisions versus only 12% of husbands.

In summary, the findings indicate that knowledge about modern contraception is high among both husbands and wives, with injectables being the most used method among couples. The primary reason for using contraception is to delay childbearing, and the primary reason for not using contraception is that such decisions are "Up to God." Communication about contraception between partners is limited, with only a quarter of couples having discussed using modern contraception. However, most couples decide together about contraceptive use. Although there are still some myths and misunderstandings about contraception, belief in them is generally low. Therefore, it is recommended that FP programs should focus on increasing communication between couples, addressing misconceptions about contraception, and promoting the importance of shared decision-making between partners. Additionally, religious leaders should be encouraged to talk about contraception to improve knowledge and acceptance of modern contraceptive methods.

3.1 Contraceptive use and ideations

Table 3. Contraceptive outcomes

	Kebbi	Sokoto	Zamfara	Total
	%	%	%	%
Current modern FP use	15.6	9.4	19.3	16.2
Postpartum FP use	15.0	7.8	15.7	13.8
Intention to start using modern contraception	11.6	12.9	21.6	17.4
N	1049	976	946	2,971

Table 3.1. Have you heard of the following contraception methods?

Percentage of women 15 to 49 years with a child under 2 years and husbands reporting if they have heard of the following contraception methods

Method	Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %	p
Any modern method	**88.8**	**86.8**	**85.1**	**96.7**	**97.7**	**93.9**	**93.1**	**92.8**	.915
Female sterilization	36.8	14.9	12.8	27.1	59.6	53.8	44.7	39.9	.436
Male sterilization	23.4	15.5	6.6	30.7	43.5	46.8	31.3	36.6	.281
IUD	30.4	27.4	19.9	37.3	57.3	43.0	43.5	38.4	.409
Injectables	85.4	64.4	82.8	93.4	97.1	86.2	91.5	82.7	**.002**
Implants	82.4	33.0	70.1	67.5	94.8	73.0	86.9	63.0	**.000**
Daily pill	83.4	66.3	75.3	86.4	88.2	82.3	84.4	79.5	.187
Male condom	42.6	82.4	28.3	84.2	57.0	82.6	47.7	82.9	**.000**
Female condom	27.5	54.7	13.0	42.8	40.5	51.2	31.8	50.4	**.000**
Emergency contraception	21.3	20.2	18.8	34.4	38.6	33.5	30.7	30.7	.992
Cycle beads	21.2	22.7	14.0	30.1	37.2	34.4	28.8	31.0	.630
LAM	19.0	29.4	26.1	22.1	45.9	28.3	35.9	27.4	.096
Rhythm method	14.5	22.8	7.8	16.1	29.5	24.1	21.6	22.3	.882
Withdrawal	32.0	81.1	22.7	67.2	56.1	69.7	43.8	71.8	**.000**
Spermicide	11.2	12.2	5.7	18.3	23.8	20.3	17.2	18.1	.813
Diaphragm	11.4	15.4	4.5	7.7	23.4	14.6	16.7	13.4	.329
Sayana press	22.4	20.0	12.7	23.0	28.8	21.5	23.9	21.5	.568
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across all three states combined of H$_0$: mean value for wives = mean for husbands

Table 3.2. Current use of contraception by method type

Percentage of women 15 to 49 years with a child under 2 years and husbands reporting current use of contraception by method

Method	Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %	p val
Any modern method	**15.6**	**13.4**	**9.4**	**16.1**	**19.3**	**25.2**	**16.4**	**20.8**	**.239**
Female sterilization	0.1	0.0	0.1	0.0	0.1	0.3	0.1	0.2	.321
IUD	0.1	0.3	0.1	0.1	1.1	0.0	0.7	0.1	**.000**
Injectables	6.4	9.7	3.8	11.7	9.4	18.3	7.5	15.1	**.004**
Implants	5.3	5.3	3.9	3.0	5.6	6.4	5.2	5.5	.803
Daily pill	3.2	2.8	0.8	2.3	2.0	3.3	2.0	3.0	.170
Male condom	0.0	1.4	0.0	0.5	0.0	0.2	0.0	0.5	**.000**
Cycle beads	0.0	0.0	0.0	0.3	0.5	0.1	0.3	0.`	.366
LAM	0.0	0.1	0.2	0.1	0.2	0.0	0.1	0.0	**.046**
Withdrawal	0.0	3.1	0.0	2.2	0.0	0.5	0.0	1.4	**.000**
Traditional methods	2.0	0.5	2.0	0.2	2.2	0.5	2.1	0.4	**.000**
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across all three states combined of H$_o$: mean value for wives = mean for husbands

Table 3.3. Reasons for using a contraceptive method

Percentage of women 15 to 49 years with a child under 2 years and husbands who are currently using contraception and reported reasons for method use

Characteristic	Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %	p
Delay childbearing	75.9	95.5	46.7	92.3	65.8	91.7	64.6	92.3	**0.000**
Stop childbearing	8.8	8.9	9.9	8.6	11.5	11.9	10.7	11.0	0.951
Partner wants to use	24.6	17.9	19.9	30.3	28.2	19.0	26.2	20.5	0.282
Provider recommends	13.8	9.3	2.2	23.6	6.6	13.8	7.2	14.6	**0.012**
Protect against STIs	0.8	0.4	0.0	2.8	0.3	1.4	0.3	1.4	0.066
N	207	151	163	127	255	226	625	504	

P val refers to significance test across all three states combined of H$_o$: mean value for wives = mean for husbands

Table 3.4. Reasons for not using a contraceptive method

Percentage of women 15 to 49 years with a child under 2 years and husbands who are not currently using contraception and reported reasons for non-use

Characteristic	Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %	P
Fear infertility	9.5	22.8	17.9	34.8	4.2	9.2	8.5	17.8	**0.000**
Infrequent sex	0.7	5.2	0.8	2.2	2.6	2.6	1.8	3.1	0.153
Can't get pregnant	14.0	1.9	3.2	6.6	4.0	2.7	6.0	3.3	0.104
Breastfeeding	15.1	4.2	12.7	3.3	17.4	15.8	15.8	10.4	0.100
Away from husband	2.8	1.7	2.7	2.5	2.6	1.3	2.7	1.6	0.154
Trying to get pregnant	19.3	32.5	10.0	36.4	8.0	11.8	10.9	21.9	**0.000**
Respondent opposes	10.3	3.2	15.5	8.4	11.5	4.8	12.2	5.1	**0.000**
Spouse opposes	23.3	4.1	21.8	11.3	13.0	7.5	17.3	7.4	0.000
Others oppose	0.0	0.3	1.0	0.9	0.1	0.2	0.3	0.4	0.635
Any opposition	23.9	5.8	28.7	16.9	17.3	8.7	21.2	9.6	0.000
Knows no method	5.8	1.7	2.2	2.9	0.7	5.9	2.1	4.2	0.129
Knows no place	1.1	0.5	0.5	2.0	1.4	1.0	1.1	1.1	0.994
Fear side effects	3.5	7.4	7.1	7.5	5.2	3.5	5.3	5.3	0.991
Facility distance	1.3	0.7	0.1	0.5	0.5	0.2	0.6	0.3	0.332
Transportation difficult	0.2	0.1	0.0	0.1	1.6	0.1	0.9	0.1	**0.001**
Costs too much	0.8	0.5	0.8	0.3	0.7	0.3	0.7	0.3	0.143
Inconvenient to use	1.0	11.5	2.7	5.1	7.6	6.6	5.1	7.5	0.239
Preferred method unavailable	0.1	0.4	0.0	0.6	0.4	0.4	0.2	0.4	0.302
Interferes with natural body processes	2.0	4.1	5.1	4.8	6.0	7.5	5.0	6.1	0.455
Up to God	24.5	46.0	22.5	24.2	28.6	33.2	26.3	34.5	**0.024**
N	920	914	951	714	821	732	2692	2360	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 3.5. Intention to use contraception in the next 6 months

Percentage of women 15 to 49 years with a child under 2 years and husbands who intend to use / continue to use contraception in the next 6 months

Intention		Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %	p
Intention	to start	11.6	2.5	12.9	4.9	21.6	13.2	17.4	8.9	**.000**
N		862	875	864	693	736	722	2,462	2,290	
Intention	to continue	83.7	79.8	85.8	91.6	89.8	96.1	88.0	92.6	.055
N		187	190	112	148	210	236	509	574	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 3.6. Perceived contraception benefits for future children

Percentage of women 15 to 49 years with a child under 2 years and husbands who report any benefits of contraceptive use for future children

	Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %	P val
Better growth	73.9	66.6	65.7	71.4	73.2	50.3	71.7	58.0	**.001**
Better nutrition	35.7	34.8	12.5	29.6	37.4	20.5	31.7	25.5	.093
Better health	41.8	30.8	27.9	47.4	36.6	30.4	35.8	33.8	.612
Better survival	23.0	20.9	8.3	16.8	20.5	11.7	18.4	14.8	.260
More maternal attention	28.2	30.7	12.4	11.5	29.3	14.0	25.4	17.3	**.010**
Better education	8.7	10.9	1.7	3.5	13.2	9.8	9.8	8.8	.712
More opportunities	5.8	8.6	1.9	7.3	17.7	3.9	11.8	5.6	**.001**
No benefits	8.7	14.2	9.6	9.1	9.4	9.1	9.3	10.3	.593
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 3.7. Perceived contraception benefits for women

Percentage of women 15 to 49 years with a child under 2 years and husbands who report any benefits of contraceptive use for women

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	p val
Any benefits	87.2	81.2	83.6	85.7	88.2	79.7	87.0	81.2	.104
Rest after birth	76.5	73.3	66.8	70.9	78.3	59.5	75.5	64.8	**.008**
Better health	45.9	31.9	21.9	41.8	44.4	29.9	39.9	32.6	.069
Beauty and youth	35.0	19.9	14.0	24.7	35.3	27.4	30.6	25.2	.161
Fewer complications	18.8	20.0	11.4	15.5	20.2	16.8	18.0	17.2	.808
Fewer unwanted pregnancies	19.6	12.2	13.6	12.1	19.6	8.9	18.3	10.3	**.003**
Fewer children to school	7.1	7.4	2.3	2.3	8.6	3.3	6.9	4.0	.111
Family has more money	5.6	5.0	1.8	1.9	7.9	2.6	6.1	3.0	**.035**
More time with husband	7.6	20.3	5.4	16.4	17.6	3.6	12.9	9.8	.302
No benefits	8.1	14.2	9.1	8.4	9.8	7.7	9.3	9.3	.985
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	

P val refers to significance test across all three states combined of H$_o$: mean value for wives = mean for husbands

Table 3.8. Contraceptive beliefs, attitudes and perceived social norms

Percentage of women 15 to 49 years with a child under 2 years and husbands who agree or not with the following beliefs, attitudes or perceived social norms

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	val
Approve of FP for birth spacing	45.8	31.0	43.9	29.4	49.0	42.8	47.2	37.6	**.022**
It is important for couples to discuss FP	72.8	71.5	69.6	79.7	81.8	66.8	77.3	70.3	**.049**
Would be called bad names if use FP	16.0	15.1	34.9	27.7	17.1	28.5	20.7	25.3	.068
Couples using FP have a better quality of life	72.1	54.3	68.9	58.5	74.9	69.8	73.0	64.1	.066
Religious leaders should speak about FP	76.8	52.6	63.9	46.6	64.8	65.3	67.1	58.9	**.036**
Most couples in community use FP	55.5	44.6	51.7	37.1	76.6	49.0	66.8	45.7	**.000**
Side effects are normal and usually go away	68.0	49.1	52.4	49.9	68.3	58.7	64.8	54.9	**.019**
Contraceptives can make women infertile	22.3	43.7	36.9	43.7	20.6	24.1	24.4	32.2	**.005**
Contraceptives can harm a woman's womb	23.2	36.7	35.5	43.3	22.3	20.7	25.3	28.6	**.048**
FP can reduce a man's sexual urge	13.6	32.5	21.2	33.9	16.8	13.1	17.0	21.5	.179
FP can reduce a woman's sexual urge	13.3	35.7	20.9	33.6	17.1	12.4	17.1	21.7	.122
Contraceptives can cause cancer	13.8	36.7	25.0	35.2	18.0	15.8	18.7	24.2	**.046**
Contraceptives can give you deformed babies	13.6	36.5	23.2	35.6	15.0	8.3	16.5	19.9	**.042**
Contraceptives can give women health problems	25.6	39.7	47.5	47.2	29.6	19.2	32.6	29.2	**.010**
FP can make women promiscuous	12.2	33.6	26.9	33.9	17.8	15.0	18.6	22.8	**.048**
Any myth	**29.5**	**52.7**	**51.0**	**52.5**	**34.9**	**33.7**	**37.2**	**41.6**	.365
Women's bodies are not ready for childbirth until 18	35.3	20.4	30.3	46.6	40.6	20.5	37.3	25.5	**.009**
Women over 35 have more pregnancy complications	47.5	34.3	37.8	27.4	59.9	29.1	52.5	29.9	**.000**
N	1,088	1,065	1,045	841	1,001	958	3,144	2,864	

P val refers to significance test across all three states combined of H_o: mean value for wives = mean for husbands

Table 3.9. Spousal communication about contraception

Percentage of women 15 to 49 years with a child under 2 years and husbands who report ever having a discussion with their partner about contraception

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P Val
Discuss number of children	5.3	14.1	5.7	9.0	11.9	19.7	9.2	16.4	**.001**
Discuss use of FP	15.5	16.0	17.1	19.3	32.8	33.6	25.7	26.9	.127
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	
Topic (Among those couples who discussed)									
Which method to use	74.1	89.3	50.6	80.3	78.6	63.5	74.0	69.2	.281
Spacing	82.1	72.8	64.3	62.3	67.8	40.3	69.1	47.7	**.000**
Limiting	26.5	44.0	18.6	16.6	13.6	26.4	16.0	27.4	**.007**
Side effects	22.6	47.0	17.2	37.7	25.7	15.0	24.1	22.4	.732
N	177	188	192	154	325	305	694	647	

P val refers to significance test across all three states combined of H_o: mean value for wives = mean for husbands

Table 3.10. Whose decision is it to use contraception?

Percentage of wives aged 15 to 49 years with a child under 2 years and their husbands reporting on who decides about using contraception

Decider	Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %	P Val
Mainly my decision	16.1	38.4	17.0	70.6	25.5	29.3	21.7	39.3	.000
Mainly partner	34.1	0.6	39.3	1.9	19.5	6.0	26.8	4.0	
Decide together	49.6	61.0	41.6	27.4	52.6	63.8	49.6	56.1	
Someone else	0.1	0.0	2.1	0.1	2.5	0.9	1.9	0.6	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	

P val refers to significance test across all three states combined of H$_o$: mean value for wives = mean for husband

Table 3.11. Who influences decisions about using contraception?

Percentage of women 15 to 49 years with a child under 2 years and husbands who report who else influences your decisions about using contraception

Influence	Kebbi Wife %	Kebbi Husband %	Sokoto Wife %	Sokoto Husband %	Zamfara Wife %	Zamfara Husband %	Total Wife %	Total Husband %	P Val
No one else	9.5	87.1	17.7	72.1	22.5	73.0	18.7	76.0	.000
Spouse/partner	87.7	11.0	81.3	5.6	75.2	14.7	79.2	12.1	.000
Mother-in-law	11.3	0.8	8.4	4.3	1.3	2.8	5.0	2.6	.057
Mother	9.2	0.4	3.6	20.8	4.4	2.0	5.3	5.3	.994
Other own family	0.6	0.6	0.3	2.2	0.8	0.4	0.6	0.8	.634
Other partner's family	0.2	0.1	0.4	0.1	0.6	0.5	0.5	0.3	.569
Friends	2.5	0.2	0.2	0.2	1.4	1.5	1.4	1.0	.397
Health provider	2.2	1.9	0.3	0.6	1.9	10.2	1.6	6.5	.000
Community / Religious leader	0.2	0.4	1.1	0.4	0.2	0.7	0.4	0.6	.459
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	

P val refers to significance test across all three states combined of H$_o$: mean value for wives = mean for husbands

3.2 Family Planning Multivariate Modeling

3.2.1 Family planning norms

Prior to examining the factors that influence uptake of modern contraception, we examine factors associated with three normative influences: approval of FP for spacing births, the subjective norm that couples who use FP have a better quality of life, and the subjective norm associated with the belief that most couples in a respondent's community use FP.

Subjective norm that most couples in the community use FP: Perceptions of the use of contraception as a normative behavior in the community is positively and significantly associated with both approval of FP and the belief in its quality-of-life benefits, suggesting that social norms around contraception usage can significantly influence individual attitudes toward FP, although inferences about causality are limited with cross sectional data. For example, among those who do not believe that most couples use contraception, the probability of approving of FP is 35.3%. However, this probability increases to 46.4% among those who do believe that most couples use contraception. The marginal effect of 11.2 percentage points (pp) is statistically significant (p<0.001). Hence, when the use of contraception is viewed as a norm in the community, people are more likely to approve of FP.

Similarly, the normative belief that most couples use contraception is also positively and significantly associated with the belief that FP increases the quality of life. Those who do not believe most couples use contraception have a 63.2% probability of believing in the quality-of-life benefits of FP. This probability jumps to 76.2% for those who believe that most couples use contraception. The 13.0 pp difference is statistically significant (p<0.001), indicating that perceiving contraception use as a norm in the community may increase the belief that FP improves quality of life.

Injunctive norms about contraceptive use: Injunctive norms surrounding contraception play a significant role in shaping attitudes toward it. Joint approval by both partners, anticipation of community stigma, and the perceived stance of religious leaders all significantly affect the likelihood of approving FP, the belief in its quality-of-life benefits, and the belief in its community prevalence.

First, approval from both partners seems to significantly increase the belief that couples using FP have a better quality of life and that most couples in the community use FP. The approval of only the wife or the husband has different effects on these beliefs, with the husband's approval appearing more influential in the belief about community use of FP. Specifically, when looking at the belief that couples using FP have a better quality of life, when neither member of the couple approves of using contraception, the probability of believing in quality-of-life benefits is 64.9%. However, when only the wife approves of using contraception, the probability increases to 69.9%, which is an increase of 5 percentage points (p=0.004). The approval of the husband only does not significantly increase the belief (68.8%, 4.0 pp, p=0.106). However, when both partners approve of using contraception, the probability increases dramatically to 81.7%, an increase of 16.8 percentage points (p<0.001).

For the belief that most couples in the community use FP, when neither the husband nor the wife approves of FP, the likelihood that a respondent believes in its normative use in the community is only 50.3%. When only the wife approves, this belief does not increase significantly (54.4%, 4.1 pp, p=0.057). In contrast, if only the husband approves, this belief increases significantly to 61.1%, an increase of 10.8 percentage points (p<0.001). Positive concordance with this belief (i.e., when both partners approve), the probability further increases to 67.4%, a 17.1 percentage point increase (p<0.001).

Although the survey did not ask respondents about the specific FP topics they believed religious leaders should address, it provided empirical evidence supporting the idea that the involvement of religious leaders enhances various normative outcomes related to FP. Specifically, respondents who agree that religious leaders should

talk about FP are significantly more likely to approve of it (46.9%, dy/dx=15.7 pp, p<0.001), believe that it improves quality of life (76.6%, dy/dx=16.4 pp, p<0.001), and believe that most couples in the community use it (61.7%, 1 dy/dx=4.6 pp, p<0.001) compared to those who disagree or do not know.

This finding provides important support for the Breakthrough ACTION/Nigeria approach of using community and religious leaders as agents of change. Religious leaders in northwestern Nigeria clearly hold a significant position of influence and moral guidance in their communities. Open discussions of FP by religious leaders can therefore legitimize and destigmatize its use, thereby increasing individuals' approval of FP and belief that it can enhance the quality of life. By endorsing FP, religious leaders signal to the community that it is a socially accepted behavior. This can shape the injunctive norm (i.e., perceptions of what is commonly approved or disapproved of) and lead to a belief that most couples in the community are using FP (Cislaghi & Heise 2019).

The negative relationship between perceived stigma, as measured by agreement with the statement that "people would call you bad names if they knew that you used FP, and approval of contraception appears counterintuitive since one might expect, based on the Breakthrough ACTION/Nigeria ideational framework, that people who anticipate possible social disapproval or negative social consequences from engaging in a behavior would be less likely to approve of that behavior, conforming to the social norm. However, in the multivariate models, people who believe that they would be stigmatized for using FP are significantly more likely to approve of it (53.9%, 14.8 pp, p<0.001) but significantly less likely to believe that most couples use it (51.4%, -7.2 pp, p<0.001), while those who do not know if they would be stigmatized show no significant difference in approval (40.4%, 1.3 pp, p=0.692) or belief about community use (55.3%, -3.3 pp, p=0.288) as compared with those who believe they would not be stigmatized.

While keeping in mind that these data are cross sectional, and we are unable to infer causality for the estimated relationships, this paradoxical finding could have several possible explanations. First, it is possible that respondents who approve of FP may simply overestimate the actual degree of stigmatization in the community. Alternatively, as per Reactance Theory (Brehm, 1966), when people feel their freedom is threatened (such as being stigmatized or judged for using contraception), they might feel a strong psychological push to do the opposite, as a way of reasserting their autonomy. This phenomenon has been examined in the context of COVID-19 in Nigeria (Ransome Msughve Labe 2021), but its applicability to the use of contraception in northwestern Nigeria is beyond the scope of this report.

Regardless of who makes the decision, belief in the quality-of-life benefits of FP remains high, suggesting that perceived benefits may be a consistent motivator for FP use. The role of outside decision-makers in decreasing these beliefs, though not statistically significant, may warrant further investigation.

Decision-making about FP: Overall, the findings suggest that joint decision-making within couples significantly increases approval of FP but does not significantly affect beliefs about the quality-of-life benefits of FP nor the perceived normativity of FP use in the community. For example, when decisions are made jointly by both partners, there is a significantly higher probability of approval of FP at 47.2%, an 11.5 percentage point (pp) increase (p<0.001) compared to when the decision is mainly made by one individual. However, there is no statistically significant difference in cases when the decision is mainly made by one partner, either self (35.7%) or the other partner (38.4%, p=0.309), or by someone else (33.0%, p=0.734).

Similar to approval rates, when both partners decide together on FP, belief in its quality-of-life benefits slightly increases to 70.3%, although this difference is not statistically significant (p=0.209). Interestingly, even when the decision is primarily up to one partner, belief in the benefits of FP remains relatively high (68.1% for self and 67.7% for the other partner, p=0.856). However, when someone else is making the decision, belief in the quality-of-life benefits of FP decreases to 60.3%, which is a non-significant yet noteworthy decrease of 7.8 pp (p=0.052).

The probability of believing that most couples use FP does not vary significantly with who makes the FP decision, ranging from 54.8% when someone else decides to 57.8% when it's mainly the respondent's decision.

The slight decrease in belief when the decision is made by the partner (-2.7 pp, p=0.368), both together (-1.3 pp, p=0.552), or someone else (-3.0 pp, p=0.752), are not statistically significant.

Index of gender equality attitudes: There is no evidence that more gender equal attitudes significantly impact approval of FP or beliefs in its quality-of-life benefits, although they are positively associated with the belief that most couples in the community use FP. For approval of FP, this is the case across the range of the index from 0 to 4 (p-values range from 0.462 to 0.930). The probability of approving FP ranges from a low of 36.6% at an equality index of 1 to a high of 44.2% at an index of 3, indicating no consistent pattern of increase or decrease.

Similarly, there does not appear to be a significant impact of the equality index on belief in the quality-of-life benefits of FP, as all p-values are above 0.05 (range from 0.060 to 0.575). However, there is a trend of increasing belief in quality-of-life benefits with higher equality index scores, from 62.1% at an index of 0, peaking at 72.6% at an index of 4, suggestive of a potential (but not statistically significant) association between gender equitable attitudes and positive perceptions of FP.

On the other hand, the multivariate results show a significant positive relationship between the equality index and belief that most couples in the community use FP. As the equality index increases from 0 to 4, the probability of this belief rises significantly from 38.5% to 54.4%. The marginal effects of 12.0 pp (p=0.045) at an index of 1, 19.4 pp (p=0.001) at an index of 2, 19.6 pp (p=0.002) at an index of 3, and 16.0 pp (p=0.019) at an index of 4, indicate statistically significant increases in belief that most couples use FP as gender equality attitudes improve.

For other factors, wife's education, the number of children, and household wealth have a significant impact on approval of FP. The respondent's sex and the husband's education level significantly affect the belief that most couples in the community use FP. However, none of the sociodemographic variables in the analysis had a significant effect on the belief that FP improves the quality of life. Specifically:

1. **Sex:** The gender of the respondent does not significantly affect the approval of FP, the belief in its ability to improve quality of life, or its perceived community usage (p>0.05). However, women are significantly more likely than men to believe that most couples in the community use FP (65.7% vs 47.1%, dy/dx=18.6 percentage points (pp), p<0.001).
2. **Age:** Older age groups (50+) show a trend of lower approval for FP (37.4%, dy/dx=-7.1 pp), but this difference is marginally insignificant (p=0.060). Age does not have a statistically significant impact on beliefs about FP improving the quality of life or its community usage.
3. **Wife's education:** Wives with a secondary or higher level of education are significantly more likely to approve of FP (50.0%, dy/dx=11.7 pp, p<0.001). However, the education level does not significantly influence beliefs about FP improving quality of life nor perceptions of its prevalence in the community.
4. **Husband's education:** Higher education in husbands does not significantly affect approval of FP or beliefs in its ability to improve quality of life. However, if the husband has secondary or higher education, respondents are significantly more likely to believe that most couples in the community use FP (60.8%, dy/dx=10.5 pp, p=0.012).
5. **Wealth:** Respondents in the highest wealth quintile are significantly more likely to approve of FP (48.2%, dy/dx=12.2, p=0.002) compared to the lowest wealth quintile (36.0%). Wealth does not significantly affect beliefs that FP improves quality of life. However, respondents in the highest wealth quintile are significantly more likely to believe that most couples in the community use FP (60.9%, dy/dx=6.5 pp, p=0.047) relative to respondents in the lowest quintile (54.4%).
6. **Number of children:** An increase in the number of children from 1 to 4 generally corresponds with a statistically significant increase in the approval of FP for birth spacing (from 34.6% to 44.2%, p<0.01). However, this relationship does not significantly affect the belief that FP improves quality of life or that it is widely used in the community.

Table 3.2.1. Logistic regression, family planning norms

	Injunctive norm: Approve of FP for birth spacing				Subjective norm: Couples using FP have a better quality of life				Subjective norm: Most couples in the community use FP			
	Pr(Y=1)	dy/dx (pp)	S.E.	P>t	Pr(Y=1)	dy/dx (pp)	S.E.	P>t	Pr(Y=1)	dy/dx (pp)	S.E.	P>t
Sex												
Male	43.3%				69.6%				47.1%			
Female	42.1%	-1.2	3.2	0.706	68.1%	-1.5	2.5	0.537	65.7%	18.6	3.8	**0.000**
Age (years)												
15–24	44.5%				70.5%				55.7%			
25–34	43.4%	-1.1	2.4	0.652	69.6%	-1.0	1.8	0.604	56.2%	0.5	2.3	0.820
35–49	42.4%	-2.1	3.0	0.498	67.4%	-3.1	2.4	0.190	58.8%	3.1	2.5	0.218
50+	37.4%	-7.1	3.8	0.060	69.6%	-0.9	2.7	0.738	52.0%	-3.6	3.1	0.237
Wife's education												
None	38.4%				69.5%				55.0%			
Primary	44.7%	6.4	3.5	0.067	70.9%	1.3	3.2	0.677	59.3%	4.3	3.6	0.232
Secondary or more	50.0%	11.7	2.9	0.000	72.0%	2.5	2.9	0.401	59.3%	4.3	3.2	0.181
Koranic	41.4%	3.0	2.5	0.236	67.4%	-2.1	1.6	0.190	56.3%	1.3	2.4	0.578
Husband's education												
None	40.1%				69.7%				50.4%			
Primary	45.4%	5.4	4.3	0.219	68.8%	-0.9	2.9	0.750	52.7%	2.4	4.0	0.551
Secondary or more	45.2%	5.1	4.5	0.257	71.3%	1.6	2.5	0.508	60.8%	10.5	4.1	**0.012**
Koranic	40.1%	0.0	4.3	0.996	67.3%	-2.4	2.2	0.273	55.3%	4.9	3.5	0.160
Number of children												
1	34.6%				66.5%				58.1%			
2	43.5%	8.9	2.6	**0.001**	68.4%	1.9	2.6	0.465	55.3%	-2.9	2.7	0.287
3	41.4%	6.8	2.9	**0.021**	69.3%	2.8	2.7	0.298	56.0%	-2.2	3.3	0.508
4	44.2%	9.6	3.0	**0.002**	71.0%	4.5	3.6	0.207	52.9%	-5.2	2.7	**0.050**
5	42.2%	7.6	2.7	**0.006**	68.2%	1.7	3.1	0.582	58.7%	0.6	2.9	0.840
6+	44.1%	9.6	3.0	**0.002**	69.0%	2.5	3.0	0.410	57.9%	-0.2	2.8	0.942
Wealth												
Lowest	36.0%				70.7%				54.4%			
Second	38.7%	2.7	3.0	0.370	69.3%	-1.4	1.7	0.401	54.4%	0.0	2.3	0.983
Middle	42.8%	6.8	3.3	0.043	68.2%	-2.6	2.0	0.207	57.4%	3.1	2.5	0.217
Fourth	42.6%	6.7	3.3	0.042	68.8%	-1.9	2.0	0.329	55.1%	0.7	2.7	0.787
Highest	48.2%	12.2	3.9	0.002	67.7%	-3.0	2.2	0.184	60.9%	6.5	3.2	**0.047**
Exposure to Breakthrough ACTION												
Neither	41.6%				69.0%				57.6%			
Wife	42.2%	0.6	2.6	0.803	69.7%	0.7	1.6	0.681	55.7%	-1.9	2.6	0.477
Husband	40.0%	-1.6	2.9	0.590	67.3%	-1.7	1.8	0.336	53.5%	-4.1	3.0	0.173
Both	44.0%	2.5	2.9	0.399	69.5%	0.5	1.8	0.787	58.0%	0.4	2.8	0.875
Whose decision is it to use contraception?												
Mainly my decision	35.7%				68.1%				57.8%			
my partner's decision	38.4%	2.7	2.6	0.309	67.7%	-0.4	2.1	0.856	55.1%	-2.7	3.0	0.368
Both decide together	47.2%	11.5	2.4	0.000	70.3%	2.2	1.8	0.209	56.5%	-1.3	2.1	0.552
Someone else	33.0%	-2.7	8.0	0.734	60.3%	-7.8	4.0	0.052	54.8%	-3.0	9.4	0.752
Influencers												
Partner												
No	38.5%				68.2%				57.6%			
Yes	46.7%	8.2	2.2	0.000	70.0%	1.8	2.0	0.357	55.4%	-2.3	2.4	0.356
Mother-in-law												

	Injunctive norm: Approve of FP for birth spacing				Subjective norm: Couples using FP have a better quality of life				Subjective norm: Most couples in the community use FP			
	Pr(Y=1)	dy/dx (pp)	S.E.	P>t	Pr(Y=1)	dy/dx (pp)	S.E.	P>t	Pr(Y=1)	dy/dx (pp)	S.E.	P>t
No	43.0%				68.9%				56.8%			
Yes	33.8%	-9.2	3.8	0.017	69.9%	1.0	3.1	0.747	54.1%	-2.7	4.0	0.506
Mother												
No	42.9%				68.9%				56.9%			
Yes	37.7%	-5.2	3.5	0.138	70.1%	1.3	2.4	0.594	52.9%	-4.0	3.5	0.262
Other own family												
No	42.6%				68.9%				56.7%			
Yes	53.9%	11.4	9.1	0.212	66.7%	-2.3	7.2	0.753	54.3%	-2.3	11.7	0.844
Partner's family												
No	42.6%				68.9%				56.7%			
Yes	67.6%	25.1	7.8	0.001	70.0%	1.1	9.8	0.913	45.2%	-11.5	15.4	0.457
Friends												
No	42.5%				69.0%				56.6%			
Yes	57.1%	14.6	5.4	0.008	66.7%	-2.2	4.0	0.577	61.2%	4.6	4.8	0.338
Health provider												
No	42.1%				68.9%				56.8%			
Yes	58.0%	15.9	4.8	0.001	70.3%	1.5	3.4	0.670	53.1%	-3.6	3.5	0.293
No	42.7%				69.0%				56.7%			
Yes	38.2%	-4.5	7.7	0.559	51.3%	-17.7	10.1	0.082	46.6%	-10.1	11.2	0.368
Equality index												
0	40.6%				62.1%				38.5%			
1	36.6%	-4.0	5.5	0.462	65.2%	3.1	5.5	0.575	50.4%	12.0	5.9	**0.045**
2	43.6%	3.0	4.8	0.540	68.9%	6.8	5.4	0.206	57.9%	19.4	5.9	**0.001**
3	44.2%	3.6	5.0	0.470	68.0%	5.9	5.4	0.278	58.0%	19.6	6.2	**0.002**
4	41.1%	0.5	5.4	0.930	72.6%	10.5	5.6	0.060	54.4%	16.0	6.7	**0.019**
Most couples in the community use FP												
No	35.3%				63.2%							
Yes	46.4%	11.2	2.0	0.000	76.2%	13.0	1.5	**0.000**				
Who approves of FP for birth spacing												
Neither partner					64.9%				50.3%			
Wife only approves					69.9%	5.0	1.7	**0.004**	54.4%	4.1	2.1	0.057
Husband only approves					68.8%	4.0	2.4	0.106	61.1%	10.8	2.5	**0.000**
Both approve					81.7%	16.8	2.5	**0.000**	67.4%	17.1	2.6	**0.000**
People in the community will call you bad names if you use FP												
No	39.1%				69.5%				58.6%			
Yes	53.9%	14.8	2.2	0.000	68.5%	-1.0	1.9	0.603	51.4%	-7.2	1.9	**0.000**
Don't know	40.4%	1.3	3.3	0.692	65.2%	-4.3	2.2	0.122	55.3%	-3.3	3.1	0.288
Religious leaders should speak out about FP												
Disagree/Don't know	31.2%				60.3%				47.1%			

	Injunctive norm: Approve of FP for birth spacing				Subjective norm: Couples using FP have a better quality of life				Subjective norm: Most couples in the community use FP			
	Pr(Y=1)	dy/dx (pp)	S.E.	P>t	Pr(Y=1)	dy/dx (pp)	S.E.	P>t	Pr(Y=1)	dy/dx (pp)	S.E.	P>t
Agree	46.9%	15.7	2.8	0.000	76.6%	16.4	2.1	**0.000**	61.7%	14.6	2.6	**0.000**
Couples using FP have a better quality of life												
Disagree/Don't know	20.5%								43.3%			
Agree	48.5%	28.0	2.9	0.000					62.2%	19.0	2.2	**0.000**
Side effects are normal and usually go away												
Disagree/Don't know	37.9%				54.6%				48.6%			
Agree	44.5%	6.6	1.9	0.001	83.0%	28.4	2.2	**0.000**	61.6%	13.0	2.0	**0.000**
State												
Kebbi	45.7%				65.5%				53.4%			
Sokoto	48.8%	3.1	3.7	0.409	72.5%	7.0	2.1	**0.001**	54.1%	0.7	3.5	0.838
Zamfara	39.6%	-6.1	3.1	0.050	68.8%	3.3	2.1	0.124	58.7%	5.3	3.3	0.114
Obs	5,726				5,726				5,726			
Design df	164				164				164			
F(45,120) / F(47,118)	13.19				17.68				14.78			
Prob>F	0.000				0.000				0.00			

3.2.1 Use of modern contraception

Tying together the understanding of the underlying dynamics between norms, attitudes, and beliefs, we then looked at the likelihood that a wife was currently using modern contraception. As with the malaria preventive behaviors, we are interested in how couples' concordance and discordance in ideational factors affect the likelihood that a wife uses modern contraception and focus on which members of a couple report those factors (i.e., neither, wife only, husband only, both). As before, we hypothesize that positive concordance (both partners agree) surrounding a behavior-promoting factor will lead to a higher likelihood of using contraception while discordance (partners disagree) or negative concordance (both partners disagree) on the factor will decrease contraceptive use.

Subjective norms: Perceptions of the behaviors of others in the community regarding contraceptive use , as measured by agreement with the statement that "most couples in the community use FP," are positively related to a wife's contraceptive use relative to many other factors, but the findings are just shy of statisticall significance. When the wife alone holds this belief, the likelihood that she will be using modern contraception is 17.4%, 5.5 percentage points greater than when neither she nor her husband agree with the statement (11.9%), although with a p-value of 0.138, this result is not statistically significant (p=.138). Similarly, when the husband alone holds this belief, the probability of the wife using modern contraception is 15.2%, but again this result is not statistically significant (p=0.399). When both husband and wife are concordant in believing that most couples in the community use FP, the probability that the wife is currently using modern contraception increases to 18.4% (p=.083), which is close to statistically significant at the 5% level.

This finding is consistent with several theoretical constructs upon which the Breakthrough ACTION/Nigeria ideational framework is based, including the Theory of Reasoned Action (TRA), the Theory of Planned Behavior

(TPB), and Social Norms Theory. Each of these posit that perceptions about the prevalence of behaviors (like FP use) in one's social group can influence individual behavior, although these perceptions are typically coupled with positive attitudes toward the behavior and a belief in one's ability to perform it (self-efficacy or perceived behavioral control) for actual behavior change to occur.

Further, the stronger effect on contraceptive use when a couple is concordant may be a reflection of mutual understanding and support for FP use within the couple facilitating the wife's use of contraception, possibly due to more open communication about FP, shared decision-making, and mutual encouragement to use contraceptives. In the context of TRA and the TPB, concordance between partners could create a stronger subjective norm, thereby leading to higher intention and, ultimately, behavior. Similarly, as per Social Norms Theory, concordance between partners could strengthen both subjective and injunctive norms - beliefs about what is typical and what is approved in their community, which might increase the wife's contraceptive use.

Injunctive norms: Approval of FP for birth spacing shows a clear, statistically significant increase in the probability of a wife using modern contraception when either spouse, or both, agree with this statement. When neither the husband nor the wife approves of FP for birth spacing, the likelihood of the wife currently using modern contraception is minimal (2.4%). As per the ideational framework, this could be attributable to a combination of negative cognitive beliefs, such as perceiving the potential risks of contraception outweigh the benefits, or detrimental emotional responses to contraception. It might also be influenced by adverse social norms, such as community disapproval of birth spacing. However, when the wife or husband alone approves, the probability increases significantly (16.8%, p<0.001 and 18.1%, p<0.001 respectively), and is highest (21.2%, p<0.001) when the couple is positively concordant and both approve of FP.

Regarding the belief that religious leaders should speak about FP, there is again an increasing trend in the probability of a wife using modern contraception as concordance for this belief grows. When neither spouse agrees, the probability is only 9.9%, but it increases significantly to 16.8% (p=0.02) when the wife alone agrees and rises to 18.4% (p=0.008) when only the husband agrees. When both agree, the likelihood is 18.1% (p=0.005). This supports the hypothesized influence of social norms and the role of key influencers such as religious leaders on contraceptive use. As noted previously, harnessing the social influence of community and relgiious leaders is an important component of the Breakthrough ACTION/Nigeria strategic communication framework, predicated on the idea that when religious leaders advocate for FP, it may reshape community norms and values, thus creating a supportive environment for contraceptive use.

For the belief that contraceptives can make women promiscuous, the trend is similar but only reaches statistical significance when both husband and wife disagree with the statement. When both the husband and wife agree that contraceptives can make women promiscuous, the likelihood of the wife using modern contraception is lowest at 9.5%. This may be due to harmful cognitive beliefs and negative emotional responses that could contribute to self-inefficacy or a negative self-image concerning contraceptive use. On the other hand, when the wife alone disagrees with this statement, the likelihood of contraceptive use rises to 14.6% (p=0.158). If only the husband disagrees, the likelihood is 16.3% (p=0.094). When both spouses disagree, the likelihood climbs further to 19.8% (p=0.018), supporting the value of dispelling misconceptions and fostering positive attitudes and norms can increase contraceptive use.

Influencers: Breakthrough ACTION/Nigeria uses diverse communication interventions to help ensure that both partners have accurate information about contraception and can make mutually supportive decisions. However, these interventions may have differential levels of reach among other members of a couple's familial (e.g., mothers-in-law, mothers, family members) or other (e.g., health care providers) social networks.

Principal among these influences is a woman's husband, cited by eight out of ten wives as influential for decisions about contraception. In the multivariate results, when the partner is an influencer, the likelihood of the wife currently using modern contraception slightly decreases to 17.4% (from 18.7%), but this is not statistically significant (p=0.578). This may reflect shared decision-making in a relationship, suggesting perhaps that when husbands are involved in discussions about contraception, there might be a slightly lower likelihood of the wife using it, possibly tied to lower levels of approval of FP among men.

While elder women play a significant role in family decisions, mothers-in-law and mothers do not appear to play an important role in affecting contraceptive use in these models. If the mother-in-law is an influencer (as cited by 5.3% of wives), the likelihood of contraceptive use by the wife drops to 13.5% (from 17.7%), although this is not statistically significant (p=0.211). The mother's influence, also cited by approximately 5% of wives, also does not seem to have any effect on the wife's likelihood of using modern contraception, with the likelihood staying constant at 17.6% (p=0.991). If other family members from the wife's side are influencers, the likelihood of contraceptive use increases to 22.4% (from 17.5%), but this is not statistically significant (p=0.437). The influence from other family members on the husband's side significantly reduces the likelihood of the wife using modern contraception to 10.2% (from 17.6%, p=0.023), but fewer than one% of wives cite these individuals as influential. Given the low prevalence of family members as influencers (relative to the husband) and their negligible estimated effects on contraceptive use, Breakthrough ACTION/Nigeria may want to keep in mind how they target influences outside of the couple themselves.

Surprisingly, because the use of the most common contraceptive methods requires contact with health care providers, the influence of a health provider seems negligible, reducing the likelihood of the wife using modern contraception to 13.4% (from 17.7%), although this change is not statistically significant (p=0.399).

Discussion of family planning: When neither the husband nor wife reports a discussion about FP, the likelihood of the wife using modern contraception is only 5.8%. If only the wife reports having a discussion, the likelihood significantly increases to 29.8% (p=0.000). Similarly, if both the husband and wife report discussing, the likelihood is almost the same at 29.7% (p=0.000). However, if only the husband reports discussing FP, the likelihood slightly increases to 9.2%, but this result is not statistically significant (p=0.149). This underlines the importance of effective communication between spouses in influencing behavior, particularly the wife's behavior, toward using modern contraceptives.

Contraceptive knowledge: We tested the role of contraceptive knowledge, as measured by agreement with the statement that side effects are normal and usually go away, on current contraceptive use. In cases where neither the husband nor wife agrees with the statement, the likelihood of the wife using modern contraception is 18.0%. If only the wife agrees, the likelihood increases slightly to 20.1% but this is not statistically significant (p=0.585). There is almost no change in the likelihood when only the husband agrees (18.0%, p=0.995), and a slight decrease to 16.4% when both agree, though this change is also not statistically significant (p=0.666). This suggests that, at least for knowledge about side effects, measures of knowledge are not the most influential factors in the decision to use contraceptives.

Self-efficacy: If the wife is not confident in her ability to convince her husband to use FP, the likelihood of her using modern contraception is only 10.7%. However, if she is confident, the likelihood significantly increases by 7.6 percentage points to 18.3% (p=0.028), emphasizing the critical role of empowering wives to act to use contraception. While this is an important finding, it may be more a reflection of actual and not hypothetical experiences.

State of residence: The wife's likelihood of using modern contraception differs across states. In Kebbi, the likelihood is 22.2%. In Sokoto, it slightly decreases to 17.0%, but this change is not statistically significant (p=0.109). In Zamfara, however, the likelihood significantly decreases to 16.5% (p=0.015).

Table. 3.2.2 Logistic regression, current use of modern contraception

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Mother's age					
15–24 years	1.000				15.8%
25–34 years	1.432	0.803	2.556	0.221	18.7%
35–49 years	1.220	0.666	2.236	0.515	17.4%
Woman's education					
None	1.000				16.2%
Primary	1.633	0.781	3.415	0.189	20.5%
Secondary or higher	1.453	0.620	3.405	0.385	19.4%
Islamic	0.901	0.486	1.669	0.737	15.4%
Husband's education					
None	1.000				18.6%
Primary	0.715	0.242	2.114	0.540	15.8%
Secondary or tertiary	0.960	0.445	2.073	0.917	18.2%
Islamic	0.782	0.363	1.684	0.526	16.5%
Number of Children					
1	1.000				19.1%
2	0.720	0.360	1.441	0.349	16.3%
3	0.773	0.334	1.791	0.544	16.9%
4	0.963	0.421	2.203	0.928	18.7%
5	0.644	0.293	1.414	0.268	15.4%
6+	0.897	0.436	1.845	0.765	18.1%
Wealth quintile					
Lowest	1.000				19.2%
Second	1.138	0.519	2.497	0.745	20.3%
Middle	0.446	0.171	1.164	0.098	12.7%
Fourth	0.941	0.393	2.252	0.890	18.7%
Highest	0.877	0.337	2.277	0.784	18.1%
Couples Breakthrough ACTION/Nigeria exposure					
Neither	1.000				19.2%
Wife only	1.767	0.914	3.416	0.090	24.1%
Husband only	0.951	0.388	2.327	0.911	18.7%
Both agree	0.654	0.349	1.225	0.181	15.7%
Whose decision is FP?					
Mainly my decision	1.000				19.3%
My partner's decision	0.720	0.360	1.438	0.348	16.5%
Both decide together	0.806	0.531	1.224	0.307	17.4%
Influencers					
Partner					
No	1.000				18.7%

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Yes	0.855	0.489	1.495	0.578	17.4%
Mother-in-law					
No	1.000				17.7%
Yes	0.587	0.253	1.360	0.211	13.5%
Mother					
No	1.000				17.6%
Yes	1.004	0.493	2.046	0.991	17.6%
Other own family					
No	1.000				17.5%
Yes	1.751	0.420	7.296	0.437	22.4%
Other partner's family					
No	1.000				17.6%
Yes	0.369	0.157	0.868	**0.023**	10.2%
Friends					
No	1.000				17.5%
Yes	1.212	0.260	5.650	0.805	19.2%
Health provider					
No	1.000				17.7%
Yes	0.576	0.158	2.100	0.399	13.4%
Equality Attitudes Index					
0 (least equal)	1.000				36.5%
1	0.161	0.048	0.541	**0.004**	20.1%
2	0.127	0.040	0.405	**0.001**	18.1%
3	0.083	0.023	0.299	**0.000**	14.7%
4 (most equal)	0.123	0.041	0.366	**0.000**	17.8%
Discussion of FP					
No one reports discussion	1.000				5.8%
Wife only	13.337	7.785	22.847	**0.000**	29.8%
Husband only	1.796	0.807	3.998	0.149	9.2%
Both report discussion	13.253	5.939	29.576	**0.000**	29.7%
Most couples in the community use FP					
Neither	1.000				11.9%
Wife only	2.037	0.791	5.248	0.138	17.4%
Husband only	1.550	0.554	4.340	0.399	15.2%
Both agree	2.288	0.894	5.856	0.083	18.4%
Couples who use FP have a better quality of life					
Neither or husband only	1.000				2.1%
Wife only	22.704	5.293	97.391	**0.000**	18.9%
Both agree	20.945	4.861	90.239	**0.000**	18.2%
Approve of FP for birth spacing					
Neither	1.000				2.4%
Wife only	14.417	5.306	39.173	**0.000**	16.8%
Husband only	16.565	5.509	49.811	**0.000**	18.1%

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Both agree	22.791	7.924	65.556	**0.000**	21.2%
Religious leaders should speak about FP					
Neither	1.000				9.9%
Wife only	2.570	1.167	5.661	**0.020**	16.8%
Husband only	3.100	1.363	7.051	**0.008**	18.4%
Both agree	3.002	1.400	6.437	**0.005**	18.1%
Contraceptives can make women promiscuous					
Both agree	1.000				9.5%
Wife only disagrees	2.054	0.751	5.615	0.158	14.6%
Husband only disagrees	2.513	0.853	7.405	0.094	16.3%
Both agree disagree	3.792	1.270	11.317	**0.018**	19.8%
Side effects are normal and usually go away					
Neither	1.000				18.0%
Wife only	1.287	0.515	3.217	0.585	20.1%
Husband only	1.003	0.345	2.917	0.995	18.0%
Both agree	0.820	0.329	2.042	0.666	16.4%
Confident to convince husband to use FP					
No	1.000				10.7%
Yes	2.654	1.115	6.315	**0.028**	18.3%
State					
Kebbi	1.000				22.2%
Sokoto	0.544	0.258	1.148	0.109	17.0%
Zamfara	0.514	0.301	0.878	0.015	16.5%
Constant	0.000	0.000	0.002	0.000	17.6%
Obs	2660				
Design df	82				
F(29,158)	18.93				
Prob>F	0.000				

The findings from these multivariate analyses point to some important implications for Breakthrough ACTION/Nigeria and the field of SBC:

1. Promote contraceptive use norms: The data suggests that individuals are more likely to approve of FP and believe in its quality-of-life benefits if they believe most couples use contraception. Positive attitudes toward contraception then engender greater willingness to use contraception. The Breakthrough ACTION/Nigeria strategy of harnessing subjective and injunctive social norms to promote contraceptive use appears well-grounded.

2. Engage religious leaders: Given that attitudes toward FP are significantly affected by whether individuals agree that religious leaders should talk about FP, Breakthrough ACTION/Nigeria should continue to find ways to engage religious leaders in their FP efforts. This could include education sessions with religious leaders to inform them about the benefits of FP or including them in community outreach programs.

3. Educate on side effects: The acceptance and understanding of potential side effects is crucial for approval of FP, belief in its benefits, and therefore contraceptive use. Breakthrough ACTION/Nigeria should prioritize education on the nature of side effects, emphasizing that they are normal and often

temporary. This can alleviate fears and misconceptions that may prevent people from using contraceptives.

4. Encourage shared decision making: When both partners approve of contraceptive use, there is a significantly higher belief in the quality-of-life benefits of FP and greater likelihood of using contraception. Thus, promoting communication and shared decision making within couples regarding contraceptive use may help enhance positive attitudes toward FP.

Chapter 4. Antenatal, Delivery, and Newborn Care

Pregnancy intentions: Nearly all wives (91%) reported that they had wanted to get pregnant at the time of their last pregnancy (Table 4.1.1). This question was not posed to husbands. Most of the remainder had wanted to wait another few months but still wanted to get pregnant.

ANC discussions: Husbands (58%) were more likely than wives (51%) to report that they had talked about going for ANC for the most recent pregnancy (Table 4.1.2). They were largely concordant in discussion topics. Just over a third of couples talked about the benefits of attending ANC, and a similar proportion talked about where to go. Few couples, less than one in ten wives and one in twenty husbands, talked about the cost of ANC and only a smattering of couples talked about a birth plan.

ANC visits: Husbands and wives were also discordant about whether ANC had been sought during the last pregnancy, with husbands being roughly 10 pp more likely than wives to report any ANC visits (wives: 58%, husbands 68%) (Table 4.1.3). However, they were concordant on where ANC was sought. They were nearly equally likely to report that ANC visits occurred at a government hospital (wives: 49%, husbands: 48%) or a government PHC (wives: 41%, husbands 39%)

Reasons for not using ANC: All respondents, both wives and husbands, were asked questions about reasons for not attending ANC during the last pregnancy (Table 4.1.4). Such information is important for Breakthrough ACTION/Nigeria provider behavior change work to improve ANC quality care. Among couples who chose to not make any ANC visits during the last pregnancy, the most common reason was lack of perceived need (wives: 21%, husbands: 25%). Fatalism ("Up to God") (wives: 4%, husbands: 4%), spousal opposition (wives: 9%, husbands: 1%), and cost (wives: 4%, husbands: 2%) were mentioned with much less frequently.

ANC knowledge: While 54% of wives knew about attending ANC four or more times, 45% of husbands were aware of this recommendation (Table 4.1.5). However, just about 30% of wives reported that a woman should go for her first ANC visit as soon as she thinks she is pregnant or in the first trimester, whereas nearly 60% of husbands reported this timing. The findings were statistically significant for both indicators.

Husbands and wives were asked about the benefits of ANC to a woman (Table 4.1.6) and about danger signs during pregnancy (Table 4.1.7). The most common responses were to monitor the baby's growth (wives: 73%, husbands: 70%) and the mother's health (wives: 72%, husbands: 61%). Nearly all women were able to identify at least one danger sign during pregnancy that would warrant medical care, with the most common signs being vaginal bleeding (55%), fever (50%), or severe weakness (41%). More husbands (8%) than wives (3%) were unable to identify a danger sign. They were also less likely to identify most problematic issues, notably vaginal bleeding (wives: 55%, husbands: 25%) and child not moving (wives: 36%, husbands: 25%).

Postpartum care and counseling: Both husbands and wives were also generally similar in awareness of ways to protect a newborn after delivery (Table 4.1.8). The most common ways they reported were bathing the baby (wives: 52%, husbands: 53%), keeping the baby warm (wives: 53%, husbands: 43%), and immediate breastfeeding (wives: 48%, husbands: 42%). While few wives reported skin to skin contact as a way to protect the baby after birth (14%), significantly more husbands reported this way to protect the baby (23%). Although

awareness of other measures of protection for newborn was low, these were found to be statistically significantly lower for wives when compared with husbands: getting the child immunized (wives: 17%, husbands: 27%) and using chlorhexidine for the child's stump (wives: 3%, husbands: 11%, wives).

All respondents were asked about ways to help a mother recover from childbirth (Table 4.1.9). Most respondents (husbands and wives) reported rest (74%), and good nutrition (wives: 57%, husbands:46%) although this difference was non-significant. Significantly fewer wives reported the need to take misoprostol immediately after birth (9%) than husbands (26%), thereby indicating low awareness of this practice generally, but especially among women. More wives (74%) mentioned taking hot water as a means to recover from childbirth than husbands (58%), and this was statistically significant.

Attitudes: Husbands and wives exhibited somewhat conflicting attitudes toward the use of formal sector care for pregnancy-related care (Table 4.1.10). Close to 80% of husbands and nearly two thirds of wives agree that a health facility is the best place to deliver a baby even though less than one in five recent births among this sample of mothers took place in a facility. Over 90% of husbands and wives recognize that severe complications may occur during childbirth and approximately 80% of husbands and wives believe that pregnant women with 4 or more ANC visits have safer pregnancies, and yet many couples report not seeing the need for such services. Overall, 48% of husbands and 42% of wives agreed that pregnant women need ANC only when sick, while 57% of husbands and 33% of wives agreed that it is better to use a traditional provider than a health facility for ANC. These were statistically significant. A little over one-quarter of wives (28%) and less than half of husbands (43%) believed that only first-time mothers need ANC.

Decision-making: All respondents, both husbands and wives, were also asked about who influences a woman's decision to make 4+ ANC visits (Table 4.4.11) and about delivering in a health facility (Table 4.1.12). Among wives, 86% reported that their husband influences their decision about ANC, and among husbands 72% reported no one else besides themselves influences this decision. This was statistically significant. Similarly, the most commonly reported influencers of a wife's decision to have a facility delivery were husbands (84%), in contrast to husbands, whose most common responses were no one else (71%) and spouse/wife (13%). It is important to note that in the male questionnaire this question was phrased such that the husband was included as a de facto influencer, "Beside yourself and your wife/partner, who else may influence…"

Self-efficacy: Overall, 80% of wives reported having the confidence to start a conversation with their husband about attending ANC, over 90% expressed confidence in recognizing signs of pregnancy complications, and approximately three quarters felt confident in getting to a facility for ANC (Table 4.4.13). However, only 58% of wives felt confident that they could get to a health facility for delivery.

As with other health services, intentions to engage in key pregnancy-related behaviors during the next pregnancy were high, including for making 4+ ANC visits (wives: 79%, husbands: 86%), for taking SP/Fansidar to prevent malaria (wives: 83%, husbands: 89%), and to deliver in a health facility (wives: 61%, husbands: 80%). (Table 4.4.14). For these aspirations to be true, however, ANC4+ rates would need to more than double and facility delivery rates would need to triple.

4.1 Pregnancy, childbirth and pregnancy intentions

Table 4.1. Pregnancy and childbirth outcomes

	Kebbi %	Sokoto %	Zamfara %	Total %
IPTp 3+ (last pregnancy)	33.3	14.8	21.4	22.6
ANC 1+ (last pregnancy)	45.9	31.9	48.4	44.3
ANC 4+ (last pregnancy)	32.1	21.9	37.6	33.1
ANC in first trimester	36.3	24.6	16.4	22.3
Made a birth plan	36.2	32.9	58.3	48.8
Facility delivery	22.8	13.6	26.6	22.9
N	1,044	967	929	2,940

Table 4.1.1. Pregnancy intentions during last pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported on pregnancy intention for the last pregnancy

	Kebbi %	Sokoto %	Zamfara %	Total %	P val
When you got pregnant with a child, did you want to get pregnant at that time?	94.8	90.5	90.0	91.2	.033
N	1045	967	929	2,941	
Did you want to have a baby later or did you not want any more children?					
No more/None	26.1	20.2	30.1	27.3	
Later	73.9	79.8	69.9	72.7	.331
N	49	95	104	248	
How much longer did you want to wait (in months)?					
0–6 months	88.8	56.9	65.1	66.1	
7–12 months	0.0	14.8	13.6	12.1	
13–24 months	5.9	15.7	15.0	14.0	.462
25–36 months	2.6	6.5	2.7	3.6	
37–48 months	0.0	1.6	2.3	1.8	
48+ months	2.6	0.0	1.4	1.2	
Don't know	0.0	4.4	0.0	1.1	
N	38	77	70	185	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.2. Spousal discussion about ANC during last pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported having a discussion about attending ANC during the last pregnancy by topic

	Kebbi		Sokoto		Zamfara		Total		P
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	val
Discuss with partner about attending ANC?	47.7	44.2	38.9	59.3	57.2	63.4	51.2	58.3	.014
Discuss with partner benefits of ANC?	37.2	34.9	14.6	43.7	42.9	37.3	35.6	38.0	.454
Discuss with partner where to go for ANC?	33.3	29.5	24.8	40.0	35.6	26.6	32.8	29.8	.370
Discuss with partner number of ANC visits?	18.6	15.0	2.9	29.6	11.1	20.3	10.9	20.9	.001
Discuss with partner when to start ANC?	23.8	19.7	8.5	24.2	19.8	19.4	18.2	20.4	.415
Discuss with partner who goes with you for ANC?	8.6	11.3	2.2	11.4	7.3	7.6	6.5	9.1	.137
Discuss with partner transport to ANC?	9.0	7.4	3.6	5.7	16.8	7.5	12.3	7.1	.065
Discuss with partner cost of ANC?	7.5	6.7	2.6	3.3	12.7	4.4	9.4	4.7	.072
Discuss with partner birth plan during?	5.4	1.4	1.0	1.7	1.9	0.8	2.5	1.1	.019
Discuss with partner potential complications?	3.2	1.2	0.3	2.2	2.9	1.0	2.4	1.3	.127
N	1,088	1,065	1,045	841	1,011	958	1,088	1,065	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.3. Source and timing of ANC during last pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported the source and timing of ANC during the last pregnancy

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	val
Did you see anyone for ANC?	57.6	51.2	49.9	61.9	60.3	75.8	57.5	67.6	.000
Did you make 4+ ANC visits?	32.1		21.9		37.6		33.1		
N	1,044	1,065	965	841	920	956	2,929	2,862	
When did you first receive ANC for your last pregnancy?									
0–3 months	36.4		24.7		16.5		22.4		
4–6 months	55.1		62.8		68.7		64.6		
7+ months	8.2		10.1		14.7		12.4		
Don't know	0.4		2.4		0.2		0.6		
Not applicable	0.0		0.0		0.0		0.0		
N	620		491		549		1,660		
Where did you first receive ANC?									
Her home	2.0	18.2	1.9	6.7	0.6	5.0	1.1	7.5	.010
Other home	1.2	2.5	1.5	0.1	0.8	0.2	1.0	0.5	
Government hospital	47.8	19.8	23.5	40.1	56.5	58.0	48.5	48.3	
Government PHC	44.2	56.5	58.9	34.5	35.0	34.9	41.4	38.5	
Dispensary/health post	1.6	0.1	11.2	14.4	3.6	1.2	4.6	3.3	
Community health outreach post	1.0	1.0	0.3	0.4	1.2	0.2	1.0	0.4	
Nursing/maternity home	0.4	0.0	0.6	0.0	0.2	0.1	0.3	0.0	
Private hospital/clinic	1.8	0.4	1.9	3.6	0.9	0.3	1.3	0.9	
Other private source	0.0	0.5	0.0	0.2	0.0	0.0	0.0	0.1	
Chemist/drug shop	0.0	0.7	0.2	0.0	1.1	0.1	0.7	0.2	
Don't know	0.0	0.3	0.0	0.0	0.2	0.1	0.1	0.1	
N	620	563	491	520	549	694	1,660	1,777	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.4. Reasons for not attending ANC during last pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported the source and timing of ANC during the last pregnancy

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	val
Costs too much	8.0	2.6	2.1	0.6	2.6	1.7	3.7	1.7	.009
Don't know where to go	0.7	1.3	0.4	0.5	0.7	0.7	0.7	0.8	.734
Facility closed	1.5	1.3	0.4	0.5	1.8	0.4	1.4	0.6	.051
Facility distance	7.1	2.3	1.6	2.8	1.8	1.6	2.9	2.0	.260
Transport difficulty	2.5	0.8	0.4	1.3	1.3	0.3	1.4	0.6	.065
Don't trust provider	0.5	1.0	0.2	0.1	0.5	0.1	0.5	0.3	.561
Provider treats clients badly	0.5	0.9	0.2	0.0	0.0	0.2	0.1	0.3	.230
Poor quality service	0.1	2.3	0.1	0.1	1.1	0.0	0.7	0.5	.764
No female provider	0.0	0.0	0.4	0.0	1.5	0.1	0.9	0.0	.001
Spouse opposes	10.0	1.1	13.0	2.2	8.6	0.5	9.9	1.0	.000
Religious leader opposes	0.3	0.1	1.2	0.2	0.2	0.0	0.5	0.1	.001
Others oppose	0.2	0.0	0.9	0.0	0.2	1.3	0.4	0.8	.342
Don't want to go alone	0.8	1.2	1.5	1.8	1.9	0.4	1.6	0.9	.035
Not necessary to go	19.8	21.5	29.5	33.7	18.7	22.9	21.3	24.6	.266
Not customary	4.8	6.1	8.4	8.8	5.1	5.0	5.7	6.0	.864
Up to God	10.6	3.7	8.0	0.7	8.6	4.6	8.9	3.6	.005
Not yet time	0.0	0.1	0.0	6.6	0.5	1.6	0.3	2.2	.000
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.5. Knowledge of ANC timing and visits

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported knowledge of ANC timing and number of visits

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Number of times women should get a checkup during pregnancy									
None	0.1	0.0	3.4	0.4	5.6	0.2	3.9	0.2	.000
1	3.3	3.0	1.6	0.6	0.3	2.0	1.2	1.9	
2	4.5	15.7	3.8	5.2	1.0	5.2	2.4	7.5	
3	6.9	19.5	5.6	13.7	8.9	12.9	7.8	14.5	
4 or more	50.8	17.2	45.3	60.2	58.2	50.0	53.8	44.6	
Don't know	34.1	44.6	39.9	19.9	26.0	29.7	30.7	31.2	
When should women first go to ANC in pregnancy?									
As soon as she thinks she is pregnant	9.8	38.4	12.0	18.4	10.2	13.3	10.5	20.0	.000
In the 1st trimester	23.4	30.5	21.0	53.6	22.1	39.7	22.2	40.3	
At the beginning of the 2nd trimester	29.1	2.7	27.9	9.8	41.5	25.5	36.0	17.3	
At the beginning of the 3rd trimester	13.1	0.5	7.4	1.9	6.0	2.9	7.8	2.2	
Any time during pregnancy	15.1	10.3	13.7	4.6	5.5	9.4	9.3	8.6	
Other	0.6	2.0	2.6	0.0	1.1	1.1	1.3	1.1	
Don't know	8.8	15.6	15.4	11.7	13.5	8.1	12.9	10.5	
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H$_o$: mean value for wives = mean for husbands

Table 4.1.6. Perceived maternal benefits of ANC

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported any maternal benefits of ANC by benefit

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
No benefits	2.2	3.5	3.6	3.3	4.2	2.5	3.7	2.9	.237
Monitor baby's growth by provider	76.2	77.1	58.9	76.0	77.0	66.0	72.9	70.5	.519
Monitor mother's health by provider	76.5	61.1	65.0	70.7	73.0	57.7	72.0	61.0	.001
Receive mosquito net	20.0	16.1	5.2	5.5	21.8	21.1	17.8	16.9	.748
Receive medicine to prevent malaria during pregnancy	39.0	25.2	16.7	35.0	31.8	24.6	30.1	26.7	.476
Reduce risk of pregnancy complications	27.0	28.1	19.1	17.8	24.8	13.1	24.1	17.4	.057
Reduce risk of delivery complications	26.1	14.6	11.3	18.1	21.4	8.6	20.2	11.8	.010
mother prepare for postpartum and neonatal	14.3	8.3	2.5	13.4	8.8	7.8	8.6	9.0	.868
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.7. What are some danger signs during pregnancy?

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported danger signs during pregnancy by sign or symptom

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	val
No knowledge of danger signs	3.2	13.0	2.9	3.1	3.1	8.1	3.1	8.2	.001
Severe weakness	39.5	52.3	35.3	67.1	43.3	38.8	40.8	47.3	.086
Convulsions or fits	36.0	19.9	14.4	17.4	32.3	16.1	29.2	17.2	.000
Severe headache	37.1	38.8	24.5	39.0	35.4	17.8	33.4	26.6	.055
Blurred vision	29.9	24.0	14.9	6.7	20.5	10.0	21.3	12.5	.000
Fever	43.4	43.0	50.5	64.3	52.9	42.9	50.3	47.1	.388
Severe stomach pain	48.3	30.9	27.4	18.1	26.1	13.2	31.1	18.1	.001
Fast or difficult breathing	34.0	18.6	12.8	7.6	16.0	5.2	19.2	8.7	.000
Swollen feet	20.7	25.2	15.5	14.1	26.9	23.6	23.1	22.1	.800
Swollen hands	20.3	23.5	5.3	9.2	27.8	11.6	21.4	13.8	.024
Vaginal bleeding	65.3	23.0	42.5	39.6	56.4	20.4	55.3	24.7	.000
Child not moving	48.4	26.7	29.4	16.2	34.5	11.5	36.3	15.8	.000
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_o: mean value for wives = mean for husbands

Table 4.1.8. What are ways to protect a newborn immediately after birth?

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported ways to protect a newborn immediately after birth

	Kebbi		Sokoto		Zamfara		Total		P
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	val
Skin to skin contact	22.2	57.2	3.5	27.7	14.7	8.5	13.9	23.1	.009
Immediate breastfeeding	52.7	38.7	30.9	28.2	53.5	48.3	48.4	42.3	.140
Give fluids excluding breastmilk	11.2	14.4	17.3	4.5	5.5	10.9	9.3	10.5	.546
Get child immunized	19.7	15.9	10.0	21.3	17.8	33.5	16.5	27.2	.000
Use Chlorhexidine for baby's stump	7.3	21.1	1.4	7.7	2.7	8.6	3.4	11.2	.000
Use traditional medicine for baby's stump	23.3	29.9	13.4	21.6	8.0	8.6	12.4	15.9	.092
Bathe the baby	63.8	45.8	66.2	71.1	42.6	49.3	52.2	52.7	.922
Keep baby warm/give clothes	69.5	50.5	44.2	55.2	50.4	35.5	53.2	42.7	.043
Gave baby dates	14.5	23.1	19.7	30.7	21.5	8.5	19.6	16.1	.230
Put baby in mosquito net	24.6	10.8	16.7	13.3	28.4	8.9	25.0	10.2	.000
Up to God	8.5	12.9	11.9	9.6	3.3	4.1	6.3	7.1	.503
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.9. How can a woman recover well from childbirth?

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reported ways to help a woman recover well from childbirth

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Take misoprostol immediately after birth	10.2	43.1	4.7	19.2	10.7	20.8	9.3	25.5	.000
Ensure good nutrition is taken	61.7	55.6	38.6	56.0	61.9	39.3	56.8	46.2	.019
Lose weight gained during pregnancy	5.8	7.0	0.7	19.1	5.5	10.0	4.6	11.1	.010
Resume regular activity immediately	11.7	6.4	4.9	12.4	24.6	10.1	17.6	9.7	.035
Rest	88.6	77.4	55.1	69.9	74.9	74.5	73.5	74.3	.807
Take hot water	87.2	57.9	88.6	75.2	63.3	52.6	73.9	58.2	.002
Initiate postpartum FP	58.8	42.4	68.0	49.7	36.3	16.4	47.9	28.7	.000
a new mother Initiate postpartum FP	2.8	0.6	1.3	2.8	1.8	0.9	1.9	1.2	.304
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.10 Pregnancy-related beliefs, attitudes and values

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who reportedly agreed or not with certain pregnancy-related beliefs, attitudes or values

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Important for woman to discuss pregnancy with husband	94.5	93.7	90.7	92.8	97.0	96.3	95.1	95.0	.810
Pregnant women need ANC only when sick	37.5	42.9	52.5	45.3	39.4	50.8	41.8	48.0	.018
Only first-time pregnant women need ANC	23.9	42.5	30.3	28.3	28.0	48.5	27.6	43.3	.001
Better to use traditional provider than health facility for ANC	35.2	60.3	43.8	41.5	27.3	61.2	32.5	57.2	.000
The health facility is the best place to deliver a baby	72.6	65.3	52.9	85.2	64.2	82.8	63.5	79.3	.000
Pregnant women attending 4+ ANC visits have safer pregnancies	81.2	74.8	70.4	83.3	78.5	89.9	77.3	85.3	.000
Severe complications may occur during childbirth	95.4	85.4	90.1	96.1	91.8	89.9	92.2	90.1	.466
Most women in my community worry about complications in childbirth	72.4	65.4	71.1	90.1	83.3	77.8	78.3	77.4	.266
After birth, women should start using contraception	58.1	35.3	45.9	68.9	65.9	38.4	59.9	43.6	.001
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.11 Who influences decisions about ANC

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report influences on their decisions about seeking ANC during pregnancy

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
| | Wife | Husband | Wife | Husband | Wife | Husband | Wife | Husband | P |
	%	%	%	%	%	%	%	%	val
No one else	4.5	90.5	11.7	67.1	15.6	66.5	12.4	72.0	.000
Husband	94.3	4.5	85.9	8.3	82.7	16.6	85.9	12.3	.000
Mother-in-law	15.6	3.4	11.9	5.8	3.5	3.2	7.9	3.8	.005
Mother	12.1	1.4	4.0	22.2	5.4	3.3	6.5	6.5	.995
Own family	0.5	0.5	0.8	3.8	1.8	1.4	1.3	1.7	.613
Partner family	0.1	0.6	1.6	0.3	0.6	0.2	0.7	0.3	.023
Friends	1.0	0.5	1.0	0.1	2.2	1.7	1.7	1.2	.352
Health provider	1.8	2.1	1.1	0.4	3.6	13.3	2.7	8.3	.010
Community/religious leader	0.0	0.2	0.8	0.0	0.4	0.0	0.4	0.1	.013
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_o: mean value for wives = mean for husbands

Table 4.1.12 Who influences decisions about facility delivery

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report influences on their decisions about giving birth in a facility

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
| | Wife | Husband | Wife | Husband | Wife | Husband | Wife | Husband | P |
	%	%	%	%	%	%	%	%	val
No one else	5.2	90.9	13.0	67.4	16.3	64.8	13.2	71.2	.000
Husband	93.3	4.6	84.7	7.5	81.0	15.7	84.4	11.6	.000
Mother-in-law	18.0	2.5	12.7	10.0	4.0	4.6	8.9	5.1	.032
Mother	12.7	1.4	5.2	23.4	6.4	4.9	7.5	7.7	.910
Own family	0.2	0.5	0.7	3.7	1.0	1.6	0.8	1.8	.041
Partner family	0.2	0.3	0.8	0.3	0.8	0.9	0.7	0.6	.960
Friends	0.9	0.6	0.5	0.2	1.1	2.5	0.9	1.6	.313
Health provider	3.1	2.0	1.4	0.4	3.6	13.3	3.0	8.2	.016
Community/religious leader	0.4	0.5	1.0	0.0	0.4	0.1	0.5	0.2	.076
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_o: mean value for wives = mean for husbands

Table 4.1.13 Self-efficacy about ANC and facility delivery

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report self-efficacy about ANC and facility delivery

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Confident to recognize signs of pregnancy complications	93.7	83.4	88.3	83.5	91.0	83.6	91.0	83.5	**.002**
Confident to start a conversation with husband about ANC?	78.3	NA	74.7	NA	85.7	NA	81.8	NA	NA
Confident that you could get to facility for ANC?	74.1	75.3	68.0	86.9	81.2	83.8	76.9	82.5	**.007**
Confident to start a conversation with husband about facility delivery?	65.5	NA	56.3	NA	70.3	NA	66.3	NA	NA
Confident that you could get to a facility for delivery?	59.0	73.8	42.5	81.5	63.6	80.7	58.0	79.3	**.000**
Confident that you could get to facility if complications arise?	87.4	NA	80.2	NA	91.4	NA	88.1	NA	NA
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

Table 4.1.14 Intentions for ANC and facility delivery in next pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report intentions about ANC and facility delivery if the woman becomes pregnant in the future

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P val
Likelihood to make 4+ ANC visits if you become pregnant again	75.3	79.5	71.2	88.4	83.5	87.5	79.1	85.9	.001
Likelihood to take SP/Fansidar to prevent malaria if you become pregnant again	84.4	75.4	77.6	92.7	84.7	93.7	83.1	89.4	.021
Likelihood to have a facility delivery if you become pregnant again	62.6	72.6	45.7	82.9	65.4	82.0	60.5	80.1	.000
N	1,087	1,065	1,043	841	1,002	956	3,132	2,862	

P val refers to significance test across all three states combined of H_0: mean value for wives = mean for husbands

4.2 Pregnancy multivariate modeling

Injunctive norms: We hypothesized that the value that a woman and her husband place on discussing pregnancy plays a significant role in the likelihood of her making the recommended antenatal visits. This appears to be borne out by the findings. When neither the husband nor the wife believes it's important for a woman to discuss pregnancy with her husband, the likelihood of the wife making four or more ANC visits is lower (21.4%).This percentage increases slightly (24.9%) when either the wife or the husband believes in the importance of discussing pregnancy, although this result is not statistically significant (p=0.690), suggesting that this finding may not be reliable. However, the probability significantly increases to 37.9% when both the husband and wife agree on the importance of discussing pregnancy. Although the p-value is 0.182, and thus the result is not statistically significant at the conventional p<0.05 level, the size of the increase suggests a positive trend.

This finding is consistent with the Breakthrough ACTION/Nigeria Theory of Strategic Communication and Behavior Change, in which it is posited that communication within a relationship can influence both knowledge and attitudes, key factors in the decision-making process. Concordance by partners on the importance of discussing pregnancy demonstrates shared beliefs and values, creating a supportive environment that may enhance the woman's self-efficacy and positively influence her decision to attend the recommended number of antenatal visits.

This also emphasizes the role of strategic communication and interventions to promote these conversations within couples, helping to improve knowledge and attitudes about ANC and pregnancy. Although the result was not statistically significant, it's worth noting the trend as it may have practical implications for interventions designed to increase ANC visits.

Attitudes: The multivariate models examined a number of attitudes with two attitudes showing a lower value placed on ANC with formal sector health providers ("only first time pregnant women need ANC" and "It is better to use a traditional provider than a health facility for ANC) and two attitudes reflecting a higher valuation of formal sector ANC ("the health facility is the best place to deliver a baby" and "pregnant women attending 4+ ANC visits have safer pregnancies").

As expected, when both husband and wife agree that "Only first-time pregnant women need ANC," the adjusted probability of the wife making 4+ ANC visits drops to 28.5%, a statistically significant decrease compared to the probability of 35.5% (p=0.043) when both disagree with this statement, which reflects a couple's shared valuation of ANC as important regardless of the wife's parity. Having at least one partner agree with the statement (32.7% if the wife agrees but the husband does not and 33.8% if the husband agrees but the wife does not) also decreases the likelihood of making 4+ ANC visits relative to the case when both reject this attitude, although these results are not statistically significant.

Similarly, when couples reject the notion that traditional providers are preferred to health facilities for ANC, they are more likely to make 4+ ANC visits relative to when the opposite is preferred, although the size of the effect 3.3 pp (33.6% if neither agree versus 30.3% if both agree, p<.001) is not large.

Positive concordance regarding the value of formal sector providers for delivery ("The health facility is the best place to deliver a baby") also has significant and sizable effects on the likelihood of making 4+ ANC visits. When both husband and wife agree with this statement, the likelihood of the wife attending 4+ ANC visits to 35.6%, which is statistically significant (p=0.001), 16.3 pp greater than if both partners reject this notion.

When both husband and wife agree that women attending 4+ ANC visits have safer pregnancies, the adjusted probability that a woman makes the recommended 4+ ANC visits during pregnancy increases significantly to 35.4% (p=0.038), as compared with a probability of 8.3% when both disagree. On the other hand, when only the

wife agrees with the statement, the probability increases to 28.5% (p=0.134). Although this result is not statistically significant at the 0.05 level, it shows a strong trend suggesting that the wife's belief can independently influence her ANC attendance behavior. Similarly, when only the husband agrees with the statement, the probability that the wife makes 4+ ANC visits rises to 22.8% (p=0.206). Again, while not statistically significant at the 0.05 level, this increase indicates a potential influence of the husband's belief on the wife's behavior.

Self-efficacy: Confidence in being able to discuss ANC with one's husband, as hypothesized, is positively associated with the probability of her making 4 or more ANC visits. For example, when the woman is confident in her ability to discuss ANC with her husband (higher self-efficacy), the probability of her making 4 or more ANC visits increases considerably to 34.5% (p=0.011) relative to when she lacks this confidence (22.5%). As per the Theory of Planned Behavior, an essential component of the Ideational Framework, an individual's belief in their capability to perform a behavior (in this case, discussing ANC with her husband) can strongly drive their intention to execute the behavior (in this case, making the recommended ANC visits). This underscores the crucial role of fostering self-efficacy in interventions aimed at improving ANC engagement.

Influences: While not statistically significant (p=0.334), the results suggest that when a woman's partner is an influencer of decisions to use ANC, the adjusted likelihood of her making 4+ ANC visits is slightly higher (34.3%) as compared to when the partner is not an influencer (28.6%). Interestingly, when a woman's mother is an influencer, the adjusted likelihood of her making 4+ ANC visits is significantly lower (21.2%, p=0.001) compared to when the mother is not an influencer (34.9%). This could suggest that some traditional norms or beliefs passed down from mothers might serve as barriers to ANC attendance. There is a decreased probability of a woman making 4+ ANC visits if her friends are influencers (19.3%, p=0.067), although it's not quite statistically significant. This could suggest the potential impact of peer norms on health behaviors. Finally, the adjusted likelihood of a woman making 4+ ANC visits significantly increases (53.9%, p=0.005) when a community/religious leader is an influencer, although less than 1% of wives cite these individuals as influencers.

Discussion of ANC: The adjusted likelihood of a woman making 4+ ANC visits is highest when the wife alone reports discussion of ANC (55.0%, p=0.000), followed by when both partners report discussion (38.4%, p=0.034). This highlights the role of communication in promoting health behaviors, as suggested by the theory of strategic communication, and the importance of women's agency and self-efficacy, as suggested by the Theory of Planned Behavior.

Education: Wives with no education have a 34.5% probability of making 4+ visits, while those with primary education have a slightly lower likelihood (32.7%), but this is not statistically significant (p=0.543). Women with secondary or higher education have a higher probability (38.9%), although the result is not statistically significant (p=0.131). Women with Islamic education have a lower probability (30.8%), but again, this is not statistically significant (p=0.140).

Women whose husbands have no education have a 35.8% probability of making 4+ visits, while women whose husbands have primary education have a slightly lower likelihood (33.5%), but this is not statistically significant (p=0.662). Women whose husbands have secondary or tertiary education have a higher probability (37.9%), though this is also not statistically significant (p=0.688). Women whose husbands have Islamic education show a lower likelihood (28.3%), which is not statistically significant (p=0.164).

Wealth: There appears to be a general trend of increasing likelihood of making 4+ visits as the wealth quintile increases, but none of these increases are statistically significant. The probabilities for the second, middle, fourth, and highest quintiles are 32.6% (p=0.583), 33.4% (p=0.412), 35.5% (p=0.196), and 34.5% (p=0.394), respectively, relative to the poorest quintile (30.6%).

Age: The likelihood of a woman making 4+ visits to ANC increases as she gets older. Women aged 15–24 years have a 30.1% probability of making 4+ visits. The probability increases to 34.6% for women aged 25–34 years (p=0.028) and to 37.7% for women aged 35–49 years (p=0.011). The finding suggests that older women, possibly due to their experience or awareness, are more likely to make the recommended number of ANC visits.

Table 4.2 Logistic Regression, 4+ ANC visits

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Mother's age					
15–24 years	1.000				30.1%
25–34 years	1.408	1.040	1.907	0.028	34.6%
35–49 years	1.795	1.150	2.799	0.011	37.7%
Woman's education					
None	1.000				34.5%
Primary	0.871	0.555	1.367	0.543	32.7%
Secondary or higher	1.380	0.907	2.101	0.131	38.9%
Islamic	0.756	0.520	1.099	0.140	30.8%
Husband's education					
None	1.000				35.8%
Primary	0.841	0.385	1.840	0.662	33.5%
Secondary or Tertiary	1.166	0.546	2.492	0.688	37.9%
Islamic	0.574	0.261	1.259	0.164	28.3%
Wealth quintile					
Lowest	1.000				30.6%
Second	1.161	0.678	1.989	0.583	32.6%
Middle	1.237	0.740	2.068	0.412	33.4%
Fourth	1.452	0.822	2.564	0.196	35.5%
Highest	1.342	0.678	2.656	0.394	34.5%
Couples Breakthrough ACTION/Nigeria exposure					
Neither	1.000				31.2%
Wife only	1.038	0.650	1.659	0.873	31.7%
Husband only	0.964	0.552	1.683	0.895	30.7%
Both agree	1.458	0.851	2.500	0.168	36.2%
Influencers					
Partner					
No	1.000				28.6%
Yes	1.551	0.631	3.809	0.334	34.3%
Mother-in-law					
No	1.000				33.7%
Yes	1.303	0.774	2.193	0.315	37.1%
Mother					
No	1.000				34.9%
Yes	0.336	0.174	0.649	0.001	21.2%
Other own family					
No	1.000				34.0%
Yes	0.337	0.065	1.754	0.193	20.5%
Other partner's family					
No	1.000				33.8%
Yes	2.332	0.508	10.711	0.273	44.7%
Friends					
No	1.000				34.2%
Yes	0.295	0.080	1.091	0.067	19.3%
Health Provider					
No	1.000				33.6%
Yes	0.576	0.158	2.100	0.399	43.3%
Community/religious leader					
No	1.000				33.9%
Yes	4.997	1.657	15.067	0.005	53.9%

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Discussion of ANC					
No one reports discussion	1.000				14.5%
Wife only	16.203	9.239	28.417	0.000	55.0%
Husband only	1.440	0.216	9.593	0.703	15.3%
Both report discussion	7.756	1.169	51.447	0.034	38.4%
Important for a woman to discuss pregnancy with her husband					
Neither	1.000				21.4%
Either	1.330	0.321	5.505	0.690	24.9%
Both agree	3.642	0.540	24.571	0.182	37.9%
Only first-time pregnant women need ANC					
Neither or husband only	1.000				35.5%
Wife only	0.809	0.533	1.227	0.314	32.7%
Husband only	0.877	0.603	1.275	0.488	33.8%
Both agree	0.583	0.345	0.984	0.043	28.5%
Better to use traditional provider than health facility for ANC					
Neither	1.000				33.6%
Wife only	0.870	0.508	1.492	0.610	31.8%
Husband only	1.174	0.814	1.694	0.385	35.7%
Both agree	22.791	7.924	65.556	**0.000**	30.3%
Health facility is the best place to deliver a baby					
Neither	1.000				19.4%
Wife only	4.750	2.193	10.288	0.000	39.4%
Husband only	1.984	0.819	4.805	0.127	27.8%
Both agree	3.589	1.669	7.714	0.001	35.6%
Pregnant women attending 4+ ANC visits have safer pregnancies					
Both disagree	1.000				8.3%
Wife only agrees	7.152	0.539	94.849	0.134	28.5%
Husband only agrees	4.580	0.426	49.240	0.206	22.8%
Both agree	12.027	1.159	124.853	0.038	35.4%
Confident to discuss ANC with husband					
No	1.000				22.5%
Yes	2.543	1.243	5.205	0.011	34.5%
State					
Kebbi	1.000				37.3%
Sokoto	0.917	0.526	1.599	0.757	36.2%
Zamfara	0.664	0.399	1.107	0.115	32.1%
Constant	0.000	0.000	0.009	0.000	33.9%
Obs	2667				
Design df	82				
F(29,158)	13.12				
Prob>F	0.000				

Chapter 5. Nutrition and breastfeeding

While nearly all children in these states are breastfed, at least for a while, other breastfeeding practices are performed with less than ideal regularity, largely because of early introduction of liquids other than breastmilk (Table 5.3). Both husbands and wives were able to identify benefits of breastfeeding for women (Table 5.3.1) and for children (Table 5.3.2) and hold similar beliefs about the nutritional value of breastmilk, including that breastmilk contains essential nutrients for the first six months of a child's life (wives: 89%, husbands: 93%). Husbands were more likely to report that breastfeeding promotes infant bonding (33%) and is convenient (22%), while wives were more likely to emphasize convenience (31%) and promoting bonding with the infant (26%). Both husbands and wives agreed that the most important benefits of breastfeeding for the baby were good nutrition (wives: 47, husbands: 54%) and prevention of illnesses (wives: 36%, husbands: 38%).

Importantly, however, many husbands (32%) and wives (47%) do not consider it important for mothers to only give children breastmilk in the first 6 months, providing a clear explanation for thereported sub-optimal breastfeeding practices (Table 5.3.5). Other knowledge indicators are also poor; misconceptions about colostrum still persist as approximately 31% of husbands and 21% of wives believe that the mother's breastmilk after birth is bad milk. This remains a gap for SBC programs to address misconceptions and increase awareness about colostrum.

Many wives indicate that they have limited self-efficacy over exclusive breastfeeding. In Sokoto, 62% of husbands reported that mainly they decide about exclusive breastfeeding (Table 5.3.2). Many husbands in the other two states, 32% in Kebbi and 26% in Zamfara, expressed similar sentiments. For the most part, wives concur, with 37% of wives in Kebbi, 29% of wives in Sokoto, and 19% of wives in Zamfara saying it is mainly their husbands' decision. Only 7% of husbands in Zamfara, 6% in Sokoto, and 18% in Kebbi indicated that breastfeeding was mainly their wife's decision. Relatedly, only 59% of wives feel confident that they can exclusively breastfeed a child for the first six months of life (Table 5.3.5).

In terms of intention to practice exclusive breastfeeding, a higher proportion of husbands (81%) expressed an intention to exclusively breastfeed their next child as compared with just over half of wives (60%) (Table 5.3.5). While wives exhibited greater awareness in identifying signs of inadequate nutrition in children, lack of energy was the most commonly reported sign by both genders (wives: 54%, husbands: 50%).

These findings point to the direction that SBC programs should consider involving males in breastfeeding education and promotion initiatives, which would be beneficial to improve child nutrition and health outcomes. Lastly, promoting positive social norms around exclusive breastfeeding could encourage mothers to practice it more frequently as a normative behavior.

5.3 Nutrition and breastfeeding ideations

Table 5.3. Breastfeeding behaviors
Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report breastfeeding benefits for the mother

	Kebbi %	Sokoto %	Zamfara %
Did you ever breastfeed child?	96.4	98.9	97.2
Immediate breastfeeding: Did child start breastfeeding within 1 hour of birth?	39.2	24.2	43.2
N	1083	1032	986
First 3 days, was child given something to drink apart from breastmilk?	79.5	88.5	65.9
N	1,046	1,021	958
Exclusive breastfeeding: (Derived). Was child exclusively breastfed (0–5 months)?	16.6	11.0	37.4
N	216	213	207

Table 5.3.1. Breastfeeding benefits for the mother

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report breastfeeding benefits for the mother

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P
None	16.9	14.3	18.6	15.6	21.6	11.5	20.0	12.9	**0.011**
Free/No Cost	23.5	55.2	4.4	2.4	9.3	9.2	11.2	18.2	**0.029**
Convenient	35.6	36.4	12.0	18.0	36.1	18.3	30.8	22.3	**0.034**
Promote bonding with infant	28.8	50.6	8.6	35.0	32.2	25.0	26.4	32.7	**0.072**
Promote weight loss	8.8	13.2	2.2	20.6	12.6	13.5	9.5	14.8	**0.026**
Reduce blood postdelivery	7.7	14.6	2.5	11.6	6.8	15.4	6.0	14.5	**0.000**
Pain relief after birth	7.2	12.6	3.8	7.5	8.1	11.1	7.0	10.7	**0.043**
Promote maternal health	7.4	9.3	7.8	17.8	8.4	14.7	8.1	14.1	**0.009**
Improve emotional well-being	9.6	11.3	7.0	6.0	9.6	11.4	9.1	10.4	0.560
Prevents pregnancy	8.6	6.6	10.3	12.3	15.9	8.7	13.2	8.9	0.121
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 5.3.2. Breastfeeding benefits for the child

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report breastfeeding benefits for the child

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P
Good nutrition	49.1	65.5	22.6	50.8	55.4	50.7	47.0	54.0	**0.104**
Prevents illness	35.0	24.6	17.5	41.5	44.0	42.1	36.4	38.0	0.684
Promotes long-term health	19.6	20.7	10.6	42.3	21.7	29.3	18.8	29.9	**0.002**
Promotes bonding with mother	20.4	39.3	7.9	28.0	15.8	23.5	15.1	27.9	**0.001**
Leads to weight gain	19.2	16.8	14.1	30.5	10.2	13.2	12.9	17.3	0.225
Leads to higher IQ	12.7	21.5	5.6	11.6	15.5	19.6	12.8	18.5	0.112
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 5.3.2. Who decides about exclusively breastfeeding a child

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands and who makes decisions about exclusive breastfeeding

| | Kebbi | | Sokoto | | Zamfara | | Total | | F(2.43, 398.70) |
| | Wife | Husband | Wife | Husband | Wife | Husband | Wife | Husband | |
	%	%	%	%	%	%	%	%	p
Mainly my decision	18.2	31.9	32.2	61.9	29.8	25.5	27.8	34.0	8.553
Mainly partner's decision	37.1	17.8	28.6	6.1	18.9	6.7	24.9	9.1	**0.000**
Both decide together	44.0	50.2	36.3	31.9	48.3	66.4	44.8	56.1	
Someone else	0.7	0.1	2.9	0.1	3.0	1.4	2.5	0.9	
N	1088	1065	1045	841	,011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 5.3.3. Spousal discussions about breastfeeding

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report having had a discussion with her spouse about breastfeeding

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
| | Wife | Husband | Wife | Husband | Wife | Husband | Wife | Husband | P |
	%	%	%	%	%	%	%	%	
Discuss with partner about breastfeeding?									
Yes	12.6	31.7	8.8	32.2	26.1	34.8	19.5	33.6	**0.000**
N	1083	1065	1032	841	986	958	3101	2864	
Discuss with partner about breastfeeding?									
Benefits	81.7	90.8	35.7	80.1	80.1	73.9	76.0	78.6	0.552
When to start	59.1	70.0	9.8	48.7	36.5	26.0	37.1	39.5	0.696
How long to breastfeed	69.6	45.2	57.4	72.1	55.5	50.1	57.6	53.1	0.431
When to introduce solid foods	53.2	32.2	20.9	35.4	25.9	22.9	29.2	27.2	0.731
Give other liquids after birth	25.0	33.2	8.5	10.3	5.9	12.1	8.8	16.2	**0.024**
Colostrum is good/bad milk	12.7	23.5	2.7	4.1	2.0	2.6	3.6	7.3	**0.048**
N	141	372	90	263	277	340	508	975	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 5.3.4. Who else influences decisions about breastfeed a child

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report who else influences a woman's decision to breastfeed her child

	Kebbi		Sokoto		Zamfara		Total		P
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	
Who else influences decisions about breastfeeding?									
No one else	9.2	81.4	19.9	67.7	23.0	65.79	19.4	69.7	**0.000**
Partner	87.0	13.1	72.9	8.2	72.2	16.1	75.5	13.9	**0.000**
Mother in-law	19.4	4.6	12.9	6.3	4.3	3.9	9.4	4.5	0.001
Mother	10.8	1.1	3.6	22.5	3.6	4.3	5.1	7.1	0.168
Other own family	0.4	0.3	0.7	2.2	1.4	1.3	1.0	1.2	0.621
Other partner family	0.4	0.7	1.1	0.4	1.1	0.4	1.0	0.5	0.186
Friends	0.4	0.5	0.7	0.2	1.2	2.1	0.9	1.4	0.428
Health provider	3.0	1.5	0.5	0.5	3.5	14.5	2.8	8.8	**0.005**
Religious/ community leader	0.1	0.2	0.6	0.1	0.1	0.0	0.2	0.1	0.087
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_0: mean value for wives = mean for husbands

Table 5.3.4. Who else influences decisions about nutrition during pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report who else influences a woman's nutrition during pregnancy

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P
Who else influences decisions about pregnancy nutrition?									
No one else	13.7	83.5	21.2	66.8	22.2	68.1	20.2	71.3	**0.000**
Partner	83.4	11.9	73.5	8.3	74.2	14.4	76.0	12.6	**0.000**
Mother in-law	15.0	3.8	8.1	7.8	3.0	2.9	6.6	4.1	0.069
Mother	13.6	1.2	2.7	24.3	2.2	2.6	4.7	6.5	0.181
Other own family	0.4	0.3	0.2	2.3	0.8	1.1	0.6	1.1	0.200
Other partner family	0.3	0.2	0.2	0.5	0.4	0.3	0.3	0.3	0.893
Friends	1.3	0.3	0.6	0.1	0.6	2.8	0.8	1.7	0.180
Health provider	3.1	1.1	3.3	0.3	2.9	13.8	3.0	8.4	**0.003**
Religious/ community leader	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.663
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 5.3.5. Breastfeeding and nutrition ideations

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report different ideations related to breastfeeding and nutrition

	Kebbi		Sokoto		Zamfara		Total		P
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	
In your opinion, how long should a woman breastfeed her child?									
Less than six months	0.1	5.9	0.0	9.1	0.0	0.9	0.0	3.6	
6–11 months	2.8	43.1	0.1	5.4	0.9	6.8	1.1	14.7	
12–23 months	80.9	36.8	83.5	60.7	81.8	80.5	82.0	66.9	
24 months or more (correct response)	15.6	13.8	16.0	24.7	16.0	11.6	15.9	14.6	
Other	0.3	0.0	0.1	0.0	1.4	0.1	0.9	0.1	**0.000**
Don't know	0.3	0.4	0.3	0.3	0.0	0.2	0.1	0.3	
Breastmilk contains essential nutrients for first 6 months of life	87.1	90.2	90.1	91.3	89.7	94.4	89.2	92.9	0.149
Mother's breastmilk after birth is bad milk	17.1	32.8	31.9	18.1	19.1	34.4	21.4	30.9	**0.006**
Likelihood you would exclusively breastfeed next child for first 6 months	49.3	79.9	49.7	68.1	68.0	85.3	60.0	80.8	**0.000**
Most women in my community only give infants breastmilk	36.2	73.8	30.5	47.9	67.1	72.5	52.6	68.0	**0.000**
Important for mothers to only give child breastmilk in first 6 months	63.7	78.3	61.5	68.5	78.4	89.2	71.6	82.8	**0.000**
I know where to buy healthy foods for my family	66.7	81.7	58.5	85.1	82.8	83.0	74.1	83.2	**0.048**
Local healthy foods are safe for my family to eat	84.3	89.8	76.8	88.2	82.8	90.5	81.9	89.9	**0.006**
I have enough money to buy healthy foods for my family	39.2	81.4	29.8	70.4	60.1	67.7	49.1	71.3	**0.000**
Confident to exclusively breastfeed your child for the first 6 months	43.7	78.9	44.1	61.4	69.9	83.9	58.7	78.4	**0.000**
N	1088	1065	1045	841	1011	958	3101	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 5.3.6. Spousal discussion about child nutrition

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report having had a discussion with her spouse about child nutrition

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	
Discussed with partner healthy foods for children									
Yes	8.6	18.9	12.1	32.2	24.9	15.8	18.6	19.7	0.186
N	1,083	1,065	1,032	841	986	958	3101	2864	
Topic discussed with partner child nutrition									
Benefits to child	88.1	86.9	45.3	81.8	85.7	71.6	80.3	78.1	0.637
Types of food	79.3	73.2	68.1	91.1	60.8	45.9	63.7	66.1	0.743
Costs of food	67.1	32.5	16.7	51.4	20.8	33.0	24.8	38.7	**0.039**
Where to buy food	47.5	30.3	3.5	8.7	19.6	14.8	20.1	16.2	0.349
Safety of certain foods	54.3	37.7	3.5	5.9	16.7	12.9	18.6	16.0	0.545
N	94	231	121	255	282	161	497	647	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 5.3.7. Spousal discussion about nutrition during pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report having had a discussion with her spouse about nutrition during pregnancy

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	
Discuss with partner about foods to eat in pregnancy?									
Yes	14.1	23.6	19.8	32.9	25.9	25.1	22.0	26.2	0.300
N	1083	1065	1032	841	986	958	3101	2864	
Topic discussed with partner about pregnancy foods									
Benefit to mother's nutrition	85.3	91.3	63.7	81.3	82.0	73.2	78.9	78.8	0.974
Benefit to baby's nutrition	84.2	83.6	57.4	71.8	70.5	47.6	69.8	60.7	0.095
Types of food to eat	68.3	40.2	46.8	82.9	46.4	44.5	49.5	52.9	0.565
Cost of food	48.0	34.1	8.8	36.8	17.2	20.3	19.8	27.1	0.148
Where to buy food	31.0	32.4	7.6	4.1	15.8	10.2	16.3	13.2	0.384
Safety of foods in pregnancy	48.3	29.1	8.7	2.5	8.9	8.4	14.3	11.1	0.363
N	157	285	208	266	283	244	648	795	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husband

Table 5.3.8. Healthy foods to eat during pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report reasons for not eating healthy foods during pregnancy

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	
What foods are good to eat in pregnancy?									
Dairy	30.8	38.2	38.5	33.5	30.7	36.7	32.4	36.4	0.443
Bread grains	62.0	49.0	58.3	65.9	45.6	29.8	51.8	41.1	**0.018**
Roots tubers	47.1	34.3	12.9	16.4	14.6	19.9	21.1	22.4	0.712
Nuts seeds	20.3	11.4	4.9	3.2	4.8	2.2	8.1	4.5	**0.028**
Sugary foods	3.6	8.3	3.2	0.3	0.7	0.1	1.8	2.0	0.884
Butters oils fats	11.5	6.9	6.9	0.9	3.0	1.3	5.6	2.5	**0.006**
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 5.3.9. Reasons for not eating healthy foods during pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report reasons for not eating healthy foods during pregnancy

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	
Respondent opposes	8.8	3.4	11.5	2.6	14.9	5.1	12.9	4.3	**0.000**
Partner opposes	15.4	40.3	8.6	13.2	13.5	3.8	12.8	13.8	0.692
Religious leader opposes	1.8	4.3	0.2	1.3	0.3	5.4	0.6	4.4	**0.000**
Costs too much	79.8	53.7	58.5	79.6	50.1	55.6	58.2	59.8	0.757
Market too far	20.2	10.1	3.8	18.3	6.4	5.0	8.8	8.7	0.979
Not necessary	24.6	29.7	12.1	15.0	8.8	14.7	12.9	18.1	0.113
Don't know how to prepare	4.2	1.5	3.5	5.1	1.6	3.6	2.6	3.4	0.325
Bad taste	20.4	3.7	23.5	14.8	18.1	15.6	19.8	12.8	0.221
Food not available in market	17.0	2.3	4.0	4.0	1.8	3.8	5.5	3.5	0.060
Only enough for husband	10.3	0.9	4.9	1.2	15.6	3.3	12.2	2.4	**0.000**
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 5.3.10. Foods to avoid during pregnancy

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report foods to avoid during pregnancy

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P Val
Dairy	5.0	5.9	1.1	7.6	2.7	11.9	2.8	9.7	**0.000**
Bread grains	3.0	7.8	7.5	13.1	4.2	8.6	4.7	9.3	**0.004**
Roots tubers	4.2	6.1	1.1	22.1	3.9	9.5	3.4	11.1	**0.000**
Green leafy vegs	3.8	4.3	2.0	16.0	1.9	7.9	2.3	8.7	**0.000**
Mangoes pawpaw	4.2	4.2	1.0	15.1	3.8	5.6	3.3	7.1	**0.008**
Other veg fruit	2.8	2.0	1.2	11.3	1.4	1.8	1.7	3.6	**0.026**
Eggs	5.9	6.6	1.2	2.5	2.2	2.1	2.8	3.2	0.591
Any meat	3.9	1.5	2.1	3.9	3.9	0.6	3.5	1.4	**0.000**
Beans pulses	4.3	1.6	2.3	4.2	2.2	0.4	2.7	1.4	**0.044**
Nuts seeds	8.1	8.3	0.5	13.2	2.6	0.9	3.3	4.9	0.124
Sugary foods	71.2	37.9	22.6	30.3	40.2	32.2	43.0	33.1	**0.034**
Butters oils fats	21.3	22.3	7.2	21.8	19.6	8.9	17.3	14.4	0.302
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 5.3.11. Healthy foods to eat for young children

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report healthy foods for young children to eat

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	Val
What foods are good for children?									
Dairy	56.1	60.5	48.0	69.5	68.1	61.7	61.2	62.9	0.712
Bread grains	53.0	22.1	52.0	31.0	37.2	27.1	43.7	26.7	**0.000**
Roots tubers	22.2	10.1	3.9	10.0	6.1	11.5	9.0	10.9	0.455
Green leafy vegs	22.8	5.8	6.3	16.9	4.3	8.6	8.7	9.6	0.683
Mangoes pawpaw	17.6	9.7	5.3	2.9	3.6	7.1	7.0	6.9	0.941
Other veg fruit	21.1	8.7	4.0	26.8	6.9	12.4	9.3	14.3	0.095
Eggs	40.0	5.8	25.6	44.5	34.0	28.9	33.4	26.7	0.129
Any meat	38.9	3.7	27.1	31.3	32.4	15.5	32.6	15.9	**0.000**
Beans pulses	40.4	6.2	36.1	20.2	35.6	13.3	36.7	13.0	**0.000**
Nuts seeds	8.7	1.2	3.9	2.0	4.4	1.0	5.2	1.2	**0.000**
Sugary foods	0.8	7.8	2.5	0.8	5.4	0.6	3.8	2.3	0.100
Butters oils fats	6.7	1.9	2.4	1.2	1.5	0.5	2.8	1.0	**0.000**
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 5.3.12. Reasons why young children may not eat healthy foods

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report reasons why young children may not eat healthy foods

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	Val
Respondent opposes	6.2	2.2	8.2	2.5	7.2	2.5	7.2	2.4	**0.000**
Partner opposes	13.6	34.8	6.5	10.1	13.4	7.2	11.9	14.0	0.492
Religious leader opposes	2.0	4.8	0.5	1.4	0.5	6.1	0.8	4.9	**0.000**
Costs too much	73.3	53.0	51.7	78.5	53.7	54.9	57.4	59.1	0.752
Market too far	15.8	10.6	3.1	15.5	4.7	6.0	6.7	8.8	0.333
Not necessary	23.8	34.3	13.2	13.1	8.4	16.9	12.7	20.1	**0.018**
Don't know how to prepare	3.6	2.3	3.9	8.1	1.6	2.0	2.5	3.2	0.402
Bad taste	10.8	1.4	12.9	2.4	11.9	12.6	11.9	8.1	0.482
Food not available in market	15.7	1.7	2.8	6.1	3.6	2.0	6.0	2.7	**0.004**
Only enough for husband	13.4	0.8	7.2	2.0	16.2	2.4	13.7	2.0	**0.000**
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 5.3.15. Signs of poor nutrition in children

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands who report signs of poor nutrition in children

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	Val
Lack of energy	58.3	57.5	39.8	53.4	58.1	46.1	54.2	50.1	0.377
Trouble paying attention	25.1	27.6	9.2	2.5	33.4	5.2	26.4	9.7	**0.000**
Trouble learning	15.9	18.9	8.5	2.2	28.5	8.7	21.5	9.7	**0.000**
Irritability	13.5	23.2	5.4	15.0	9.5	9.1	9.4	13.4	0.085
Becomes ill easily	32.2	32.5	8.3	18.4	18.8	26.2	19.4	26.1	0.075
Weakness	33.3	22.6	23.9	23.6	34.3	32.3	31.9	28.5	0.372
Dry/scaly skin	25.3	27.9	24.7	36.9	20.6	9.9	22.5	19.1	0.248
Longer time to healing for wounds	14.7	17.4	2.0	8.4	5.0	3.2	6.4	7.4	0.518
Stunted growth	40.3	27.1	27.9	39.0	36.9	9.8	35.7	19.3	**0.000**
Thin arms and legs	34.3	14.8	19.7	12.7	23.3	9.8	24.9	11.5	**0.000**
Visible ribs	38.4	18.6	13.2	24.9	29.3	13.2	27.7	16.6	**0.000**
Crying all the time	52.2	28.0	27.7	49.3	42.4	30.1	41.3	33.4	0.121
Swollen stomach	31.9	12.5	9.4	23.6	11.7	7.2	15.5	11.6	0.162
Fever	28.0	22.3	13.3	39.9	21.0	13.3	20.8	20.4	0.898
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

5.4 Multivariate Results: Exclusive Breastfeeding

In the context of exclusive breastfeeding, several key findings emerge from multivariate results regarding women's self-efficacy and couples' concordance in attitudes and norms.

Decision-making and self-efficacy: The results indicate that self-efficacy and autonomy in decision-making play significant roles in the likelihood of exclusive breastfeeding. Women who lead in decisions regarding breastfeeding or express confidence in exclusive breastfeeding are more likely to practice it. Specifically, when the decision about exclusive breastfeeding is mainly the wife's, the probability of exclusive breastfeeding is highest, at 34.0%. This probability reduces to 31.6% when it's mainly the husband's decision (p=0.659), and further reduces to 23.9% when both decide together, which is statistically significant (p=0.040). This suggests that when decisions are made collaboratively, the likelihood of exclusive breastfeeding may decrease, possibly due to differing beliefs or knowledge gaps within the couple.

Self-efficacy, or confidence in exclusive breastfeeding and discussing breastfeeding with the husband, also plays a significant role. When both are not confident in exclusive breastfeeding, the likelihood is lowest at 3.6%. When both are confident, the probability increases to 35.2% (p=0.001). Oddly, if the wife is confident in discussing breastfeeding with her husband, the probability of exclusive breastfeeding decreases to 27.5% (p=0.386), although this result is not statistically significant and is potentially collinear with the couple's confidence in breastfeeding variable. When the latter is omitted, the effect of self-efficacy to initiate a discussion about breastfeeding with one's husband becomes positive, although it remains statistically insignificant.

Norms: Community norms, as measured by agreement with the statement that "most women in the community only give infants breastmilk for the first six months of life," seem to play a significant role in the likelihood of exclusive breastfeeding, but principally when the wife holds these normative beliefs. Exclusive breastfeeding is highest (39.9%) when the wife alone agrees with the norm. When neither the wife nor the husband agrees or when only the husband agrees that most women in their community only give their infants breastmilk, the likelihood of exclusive breastfeeding is 24.9%. Positive concordance, however, does not appear to matter in this case. If both the wife and husband agree in the community norm, the probability of exclusive breastfeeding is 27.3% (p=0.617). This could suggest that while individual agreement with community norms can boost the likelihood of exclusive breastfeeding, positive concordance — both partners agreeing on the norm — does not amplify this effect, raising interesting questions about how personal beliefs and shared perceptions individually and collectively influence health behaviors.

The belief that it is important for mothers to only give their child breastmilk in the first 6 months has a strong association with breastfeeding but again mostly when the wife alone holds this belief. The probability of exclusive breastfeeding is 23.3% when neither agree but increases significantly to 42.2% when only the wife agrees (p=0.512). When the couple is concordant in agreement, the likelihood is 28.0% but this is not statistically significant. (p=0.852). This seems to provide an interesting refutation of the concept of shared positive attitudes and beliefs positively influencing behavior, a cornerstone of theories like the Breakthrough ACTION/Nigeria Ideational Framework, the Theory of Reasoned Action, and the Theory of Planned Behavior. A deeper dive might examine how husbands' beliefs drive wives' beliefs, perhaps leading a husband's negative or erroneous health beliefs to shape the wife's beliefs.

Breastfeeding discussions: There is a very clear pattern where both positive concordance (when both the wife and husband report discussion) and the wife's individual actions are significantly and positively associated with the likelihood of exclusive breastfeeding. When neither the wife nor husband reports discussing breastfeeding, the probability of the wife exclusively breastfeeding is lowest at 21.6%. However, when both the wife and husband report discussing breastfeeding, the likelihood of the wife exclusively breastfeeding more than doubles

to 48.0%. This result is statistically significant (p=0.002), indicating that joint discussions within the couple about breastfeeding have a powerful impact on the decision to breastfeed exclusively.

Individual reports of discussions (by either the husband or the wife but not both) are also associated with a greater likelihood, but the effect sizes are not as large as when there is positive concordance. If only the wife reports discussing breastfeeding, the likelihood of exclusive breastfeeding increases significantly to 32.9% (p=.061), suggesting a strong influence of the wife's individual actions and attitudes on breastfeeding decisions. When only the husband reports discussing breastfeeding, the likelihood of exclusive breastfeeding slightly increases to 34.7%, a finding that is statistically significant (p=0.012), suggesting that the husband's independent discussions can have a significant impact on the woman's decision to exclusively breastfeed.

These findings highlight the importance of communication and shared decision-making within couples, as well as the significant role that the wife's beliefs, attitudes, and actions play in making health decisions for her child. The results also underline the importance of social and injunctive norms, as discussions about breastfeeding within the couple may reflect prevailing norms and attitudes about breastfeeding, reinforcing the decision to exclusively breastfeed. In addition, the woman's self-efficacy may be boosted when she discusses breastfeeding, leading to a higher likelihood of exclusive breastfeeding.

Influences: Husbands are the principal influencers of wives' decisions to breastfeed. Approximately three quarters of wives cite their partners, while mothers-in-law (9.2%), mothers (5.6%), and to a lesser extent health providers (2.4%) are also mentioned. In these models, the influence of close family members (partner, mother-in-law, mother) on a woman's decision to exclusively breastfeed is not statistically significant. When the partner acts as an influencer, the probability of exclusive breastfeeding increases from a baseline of 24.8% to 29.7%. However, this result is not statistically significant (p=0.393). In the presence of the mother-in-law as an influencer, the probability of exclusive breastfeeding falls slightly to 24.7%, but this result is not statistically significant (p=0.350), while the likelihood of exclusive breastfeeding increases to 35.0% when mothers are influential although this increase is also not statistically significant (p=0.589).

Notably, when a health provider is the influencer, the probability of a woman exclusively breastfeeding dramatically rises to 57.3% from a baseline of 27.5%. This result is statistically significant (p=0.039), suggesting that the influence of a health provider substantially increases the likelihood of exclusive breastfeeding. This might indicate that professional advice from health providers may carry more weight than family opinions in the decision-making process related to exclusive breastfeeding. The role of the health provider as an influencer emphasizes the importance of health education and professional advice in health behaviors.

1. **Mother's age**: The probability of exclusive breastfeeding increases with age, from a baseline of 23.1% for mothers aged 15–24 years to 33.0% for those aged 25–34 years, a result that is statistically significant (p=0.047). For mothers aged 35–49 years, the likelihood slightly increases to 24.7% but this increase is not statistically significant (p=0.829).

2. **Woman's education**: The probability of exclusive breastfeeding appears to increase with some level of educational attainment, from 29.9% for those with no education to 39.6% for those with primary education. There is no statistically significant difference in the probability for women with secondary or higher education (30.9%, p=0.931). Interestingly, for women with Islamic education, the probability decreases to 22.9%, though this decrease is not statistically significant (p=0.338).

3. **Husband's education**: Similarly, husband's education seems to have a slight impact on the likelihood of exclusive breastfeeding. While there is an increase in probability from 26.8% for no education to 33.3% for secondary education and 35.7% for tertiary education, these increases are not statistically significant (p=0.381 and p=0.389 respectively). For husbands with Islamic education, the probability decreases to 23.9%, but this is not statistically significant (p=0.652).

4. **Wealth quintile**: The wealth quintile of the household appears to have a minimal effect on exclusive breastfeeding. The likelihood of exclusive breastfeeding does not vary significantly across the wealth quintiles, with the probability ranging from 21.5% in the highest quintile to 33.6% in the middle quintile. None of these variations is statistically significant.

In summary, these findings highlight the importance of bolstering women's self-efficacy and empowering them to make health decisions autonomously. The importance of couple communication and shared decision-making is also underscored. Joint discussions about breastfeeding significantly increase the likelihood of exclusive breastfeeding. This suggests that ongoing Breakthrough ACTION/Nigeria interventions to improve communication and co-decision-making within couples could potentially enhance breastfeeding practices. This would seem to be particularly important considering the observed declines in breastfeeding practices from baseline to endline. Efforts to increase exclusive breastfeeding should thus take a multi-pronged approach, empowering women, facilitating couple communication, promoting positive community norms, and leveraging the influence of healthcare providers.

Table 5.4.1. Logistic Regression, Exclusive Breastfeeding for first 6 months of child's life

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Mother's age					
15–24 years	1.000				23.1%
25–34 years	1.984	1.009	3.904	0.047	33.0%
35–49 years	1.126	0.377	3.368	0.829	24.7%
Woman's education					
None	1.000				29.9%
Primary	1.873	0.686	5.113	0.217	39.6%
Secondary or higher	1.074	0.210	5.497	0.931	30.9%
Islamic	0.603	0.212	1.712	0.338	22.9%
Husband's education					
None	1.000				26.8%
Primary	0.665	0.197	2.246	0.507	21.3%
Secondary	1.540	0.581	4.082	0.381	33.3%
Tertiary	1.786	0.471	6.768	0.389	35.7%
Islamic	0.808	0.316	2.064	0.652	23.9%
Wealth Quintile					
Lowest	1.000				31.7%
Second	0.624	0.188	2.069	0.436	25.2%
Middle	1.139	0.274	4.736	0.857	33.6%
Fourth	1.113	0.294	4.209	0.873	33.2%
Highest	0.467	0.126	1.736	0.252	21.5%
Influencers					
Partner					
No	1.000				24.8%
Yes	1.419	0.631	3.189	0.393	29.7%
Mother-in-law					
No	1.000				28.9%
Yes	0.640	0.249	1.646	0.350	22.8%
Mother					
No	1.000				28.1%
Yes	1.591	0.290	8.722	0.589	35.0%
Health provider					
No	1.000				27.6%
Yes	6.572	1.097	39.369	0.039	57.3%

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Discussion of breastfeeding					
No one reports discussion	1.000				21.6%
Wife only	2.182	0.963	4.944	0.061	32.9%
Husband only	2.443	1.220	4.895	0.012	34.7%
Both report discussion	5.479	1.954	15.361	0.002	48.0%
Whose decision is exclusive breastfeeding?					
Mainly the wife's decision	1.000				34.0%
Mainly the husband's decision	0.851	0.413	1.754	0.659	31.6%
Both decide together	0.492	0.250	0.969	0.040	23.9%
Someone else decides	0.467	0.045	4.833	0.518	23.2%
Most women in my community only give infants breastmilk					
Neither or husband only	1.000				24.9%
Wife only agrees	2.651	0.764	9.205	0.123	39.9%
Both agree	1.183	0.607	2.306	0.617	27.3%
Mother's milk after birth is bad milk					
Neither agree	1.000				30.7%
Wife only agrees	0.873	0.335	2.275	0.779	28.7%
Husband only agrees	0.653	0.274	1.558	0.333	24.7%
Both agree	0.595	0.112	3.155	0.538	23.4%
Important for mothers to only give child breastmilk in first 6 months					
Neither agree	1.000				23.3%
Wife only agrees	3.434	0.083	142.68	0.512	42.2%
Husband only agrees	0.716	0.024	21.145	0.845	19.1%
Both agree	1.403	0.038	51.183	0.852	28.0%
Confident to exclusively breastfeed					
Both not confident	1.000				3.6%
Wife only confident	21.187	2.838	158.14	0.003	32.8%
Husband only confident	6.457	0.718	58.085	0.095	16.1%
Both confident	24.381	3.731	159.32	0.001	35.2%
Confident to discuss BF with husband					
No	1.000				34.1%
Yes	0.632	0.222	1.802	0.386	27.5%
State					
Kebbi	1.000				19.9%
Sokoto	0.836	0.316	2.207	0.714	17.8%
Zamfara	2.502	1.062	5.891	0.036	33.0%
Constant	0.000	0.000	0.009	0.000	28.5%
Obs	594				
Design df	82				
F(29,158)	5.000				
Prob>F	0.000				

Chapter 6. Child health

Child vaccination rates remain low. More than six out of ten children aged 12 to 23 months have not received a single vaccine, and complete coverage with all basic vaccinations ranges from a meager 4% in Sokoto to only 15% in Zamfara.

This is in spite most respondents reporting favorable perceptions of vaccination services and indicating high self-efficacy to use vaccination services. For example, most husbands (89%) and wives (86%) agreed that most people in their communities trust immunization health workers and that health facilities often have vaccines available (wives: 78%, husbands: 83%) (Table 6.2.2). They also perceived high vaccine efficacy (wives: 80%, husbands: 90%) and appropriate risk perceptions. The majority of wives (75%) and husbands (86%) recognized that vaccines can prevent severe illnesses (Table 6.2.3). Approximately three quarters of wives indicated that it is easy to take children for vaccinations and easy to track their child's vaccinations. Further, vaccinating children appears to be a communtiy norm; 74% of wives and 84% of husbands said that most parents in the community take children for routine immunizations (Table 6.2.2).

Even so, negative attitudes and beliefs are apparent. Approximately a quarter of wives (26%) and a third of husbands (34%) believe that vaccines can be dangerous to a child's health. Further, the number one reason reported by wives for not vaccinating a child was their husband's opposition, cited by approximately half of wives of unvaccinated children. A further quarter of wives cited the belief that vaccines are not safe or have negative side effects. Distance or absence of transport was cited only by one in ten wives. As with other health servies (Table 6.2.1), husbands appear to be the principal influence for decisions about child vaccinations, ranging from 82% in Zamfara to 93% in Kebbi. Regardless, both husbands and wives indicated a high likelihood to vaccinate their next child (wives: 77%, husbands: 91%).

Knowledge of vaccinations and vaccination schedules was lacking. Only one third of husbands (35%) and wives (32%) indicated that a child's first vaccination should be given at birth. Approximately 37% of husbands and 42% of wives could not recall the number of times a child should be vaccinated before they turn one (Table 6.2.3).

Reporting of spousal communication about child immunizations differed between husbands (57%) and wives (32%) (Table 6.2.4). For couples who reported having a discussion with their partners on their child's immunization, the majority reported discussing the benefits of immunization to the child (females: 76%, husbands: 65%), including whether to vaccinate the child (wives: 50%, husbands: 43%), and where to go to get the child vaccinated (wives: 50%, husbands: 40%).

6.1 Vaccination rates

Table 6.1.1 Vaccinated children 12–23 months by type of vaccine

Percentage of last-born children aged 12–23 months who received specific vaccines at any time before the survey, by baseline and endline rounds

	Kebbi %	Sokoto %	Zamfara %
BCG coverage	33.1	24.2	38.4
DPT1 coverage	23.9	16.4	29.1
DPT2 coverage	18.8	12.8	24.0
DPT3 coverage	12.2	6.5	18.1
Polio1 coverage	34.3	29.7	37.4
Polio2 coverage	32.0	25.2	34.5
Polio3 coverage	27.6	18.3	30.1
Measles1 coverage	18.9	12.0	22.5
All basic vaccinations (BCG, Measles1, DPT3, Polio3)	9.4	4.2	15.3
N	575	485	550

6.2 Vaccination ideations

Table 6.2 Vaccination practices for children 12–23 months

Percentage of last-born children aged 12–23 months whoever received vaccinations, and among those, total times taken for vaccination and vaccine card receipt,

	Kebbi %	Sokoto %	Zamfara %
Has the child ever received any immunizations?	38.2	34.1	39.5
N	575	485	550
(Derived) BCG coverage	33.1	24.2	38.4
(Derived) DPT1 coverage	23.9	16.4	29.1
(Derived) DPT2 coverage	18.8	12.8	24.0
(Derived) DPT3 coverage	12.2	6.5	18.1
(Derived) Polio1 coverage	34.3	29.7	37.4
(Derived) Polio2 coverage	32.0	25.2	34.5
(Derived) Polio3 coverage	27.6	18.3	30.1
(Derived) Measles1 coverage	18.9	12.0	22.5
(Derived). All basic vaccinations (BCG, Measles1, DPT3, Polio3)	**9.4**	**4.2**	**15.3**
N	575	485	550

Table 6.2.1. Who else influences decisions about getting a child vaccinated?

Percentage of pregnant women and women with a child under 2 years and their husbands reporting who influences decisions to vaccinate a child

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P
Who influences decision about vaccination?									
No one else	5.2	85.1	11.5	66.2	14.3	61.7	11.7	67.8	**0.000**
Partner	93.3	11.9	84.2	10.5	81.8	21.2	84.8	17.1	**0.000**
Mother in-law	17.4	2.4	9.9	7.8	3.7	3.6	8.0	4.1	**0.007**
Mother	11.1	1.0	3.4	23.6	2.3	3.1	4.4	6.6	0.103
Other own family	0.3	0.2	0.5	1.8	0.3	1.4	0.4	1.2	**0.002**
Other partner family	0.2	0.1	0.7	0.3	0.9	0.4	0.7	0.3	0.194
Friends	0.7	0.6	0.3	0.7	1.1	2.1	0.9	1.5	0.219
Health provider	1.5	1.4	0.5	0.3	3.1	14.0	2.2	8.5	**0.005**
Religious/community leader	2.3	1.0	1.4	0.6	0.3	2.1	1.0	1.6	0.338
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H₀: mean value for wives = mean for husbands

Table 6.2.2. Vaccinations and health services perceptions

Percentage of women with a child under 2 years and their husbands who reported specific perceptions about health services for child vaccinations

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P
Immunization services in my community are free	88.0	70.4	83.6	85.7	93.0	91.6	89.9	85.7	0.117
Most people in my community trust immunization health workers	81.7	79.3	75.5	76.4	91.9	97.7	86.1	89.5	0.144
Health facilities in my community often have vaccines available	68.3	76.0	64.7	63.2	86.9	93.0	78.1	83.4	0.208
Most parents in my community take children for routine immunizations	63.6	76.3	62.2	66.7	82.7	91.9	74.2	83.5	**0.015**
N	1083	1065	1032	841	986	958	3101	2864	

P val refers to significance test across the all three states combined of H₀: mean value for wives = mean for husbands

Table 6.2.3. Vaccine knowledge, perceptions, self-efficacy, and intentions

Percentage of pregnant women and women with a child under 2 years and their husbands reporting specific knowledge, perceptions, self-efficacy, and intentions for child vaccinations

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	
Before 12 months, how many times should a child be vaccinated?									
No times	0.3	0.0	7.3	0.5	5.8	0.3	4.9	0.3	
1–5 times	41.6	45.3	33.2	60.9	35.1	56.2	36.1	54.7	
6–10 times	11.3	3.1	8.9	8.8	21.5	9.7	16.6	8.0	0.000
11 +times	0.1	0.0	0.3	0.2	0.9	0.5	0.6	0.3	
DK	46.8	51.6	50.3	29.5	36.7	33.4	41.8	36.6	
At what age should child receive first vaccination?									
At birth	43.1	29.7	18.9	12.0	33.5	44.1	32.4	34.7	
Before naming ceremony	14.5	18.7	12.6	21.9	14.3	16.1	14.0	17.8	
After naming ceremony but before coming out	12.6	10.5	24.1	36.7	18.2	12.2	18.3	16.6	
At coming out/six weeks	4.3	12.7	4.6	5.0	3.6	10.1	3.9	9.7	0.000
Three months	5.9	2.5	3.8	4.1	1.3	6.1	2.8	4.9	
After one year	0.6	0.2	2.1	3.3	0.7	0.5	1.0	1.0	
Other	0.5	1.7	6.3	0.2	2.9	0.5	3.1	0.7	
Don't know	18.6	23.9	27.6	16.8	25.6	10.5	24.5	14.7	
In your opinion, how effective are childhood vaccines?	85.1	83.1	75.1	88.2	80.7	93.7	80.4	90.2	0.002
Many illnesses vaccines prevent are severe	77.9	76.6	72.7	86.4	75.3	90.1	75.3	86.3	0.002
I know where and when to get a child vaccinated	77.0	75.2	72.9	87.2	84.0	86.8	80.1	84.3	0.223
It is easy for mothers to take their child for vaccinations	64.6	76.0	57.8	74.4	87.8	93.1	76.3	85.7	0.001
It is easy for mothers to track their child's immunizations	57.5	73.2	48.8	66.5	86.0	91.8	71.8	82.7	0.000
Vaccines have chemicals that can be dangerous to child health	20.8	45.5	29.4	38.5	25.9	28.8	25.6	34.4	0.140
Likelihood to get next child fully vaccinated	79.8	83.2	69.3	88.1	78.3	94.4	76.7	90.7	0.000
N	1083	1065	1032	841	986	958	3101	2864	

Table 6.2.4. Spousal discussion about vaccinations

Percentage of women with a child under 2 years and their husbands who reported to have had a discussion with their spouse about vaccination by topic

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
| | Wife | Husband | Wife | Husband | Wife | Husband | Wife | Husband | P |
	%	%	%	%	%	%	%	%	
Discussed with partner about immunizations	33.9	42.6	24.3	58.2	35.0	62.9	32.5	57.4	**0.000**
N	1083	1065	1032	841	986	958	3101	2864	
Topic of discussion with partner about immunizations									
Benefits	75.9	77.8	45.3	69.9	83.9	60.8	75.9	65.4	**0.030**
Whether to get vaccination	58.0	61.2	42.3	65.5	48.3	31.4	49.5	43.0	0.140
Where to go	56.8	33.5	28.2	57.0	53.9	36.3	50.4	39.9	**0.040**
When to go	50.8	38.7	20.7	38.4	34.3	28.5	35.8	32.1	0.414
Who should go with you	17.5	20.4	3.1	16.8	12.0	9.2	11.8	12.5	0.766
Cost	7.4	15.0	3.2	2.2	6.8	5.7	6.3	6.6	0.927
Transportation	17.6	10.8	5.2	5.3	22.7	12.0	18.7	10.5	0.100
Health risks to child	8.6	6.9	3.3	4.4	1.6	2.8	3.5	3.8	0.829
N	369	467	263	499	349	597	981	1563	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 6.2.5. Reasons for not vaccinating last child: Wives only

Percentage of women with a child under 2 years and their husbands who reported specific reasons for not vaccinating the child

	Kebbi	Sokoto	Zamfara	Total
	%	%	%	%
Too expensive	5.9	4.7	9.4	7.7
Facility closed	7.4	6.8	5.2	6.0
Distance/transport not available	15.9	8.8	10.1	11.1
No female provider	7.2	1.0	1.3	2.5
Vaccine often not available	12.3	4.3	1.4	4.3
Disrespectful provider	16.4	0.6	1.1	4.3
Poor quality service	6.9	3.1	1.6	3.0
Vaccines not effective	2.6	7.3	8.9	7.2
Vaccines not safe/fear side effects	35.2	27.2	24.5	27.3
Fear needles	21.4	21.5	25.4	23.8
Husband opposes	41.5	49.8	48.9	47.5
Religious / community leaders oppose	3.0	2.9	1.1	1.9
N	422	373	380	1,175

Table 6.2.5. Reasons why people in the community may not get their children vaccinated: husbands

Percentage of husbands who reported specific reasons why a child might not be vaccinated in this community

	Kebbi %	Sokoto %	Zamfara %	Total %
Too expensive	27.0	6.9	19.3	18.7
Facility closed	16.4	4.1	7.5	8.9
Distance/transport not available	19.9	22.2	16.7	18.5
No female provider	5.9	1.8	3.3	3.6
Vaccine often not available	8.9	4.6	3.0	4.6
Disrespectful provider	7.2	9.8	1.1	4.1
Poor quality service	9.6	7.5	1.9	4.7
Vaccines not effective	13.0	3.4	1.0	4.2
Vaccines not safe	15.2	26.4	9.2	13.9
Fear needles	8.2	8.8	5.1	6.5
Spouse opposes	20.8	46.7	27.1	29.5
Religious / community leaders oppose	1.6	11.8	3.3	4.5
Don't know where to go	0.2	1.1	2.3	1.6
N	1,065	842	959	2,866

Routine Child Immunizations Multivariate Results

To test for the influence of different ideational factors on childhood immunizations, we estimated logistic regression models for the outcome that a child aged 12–23 months is fully vaccinated.

Immunization discussion: Discussions with couples about child health in general and routine childhood immunizations more specifically are important to ensure that both partners have awareness and understanding of the value, timing, and efficacy of immunizations in preventing many possible severe childhood illnesses and diseases, as well as to allay concerns or counter misinformation and to promote shared decision-making. Discussions may be particularly important for wives in order to offer an opportunity to voice their perspectives, assert their role, and influence decisions related to their children's health.

These results seem to suggest that the wife's involvement in discussions about immunizations is particularly crucial for a child's likelihood of being fully vaccinated. In the absence of a discussion reported by either partner, the probability of a child being fully vaccinated is only 2.3%. The probability of a child being fully vaccinated jumps dramatically to 21.4% when only the wife reports having discussed immunizations. This is a very large effect and is statistically significant (p=0.000). Conversely, when only the husband reports discussing immunizations, the probability of a child being fully vaccinated actually decreases slightly to 1.9%. This result is not statistically significant (p=0.736), suggesting the husband's discussions alone may not have a meaningful impact on immunization rates, particularly if the conversation is not recalled by the wife.

The highest probability of full vaccination (26.6%) occurs when both parents report having discussed immunizations. This is also highly statistically significant (p=0.000), indicating that joint discussions are most beneficial for ensuring the child is fully vaccinated.

Immunization knowledge: Mother's knowledge about the timing of the first vaccination seems to be more impactful than the father's when it comes to ensuring a child is fully vaccinated. When only the wife is aware that the first vaccination is at birth, the probability of full vaccination rises to 13.9% (from 9.6% if neither partner knows). The p-value of 0.077 suggests that this increase, while not statistically significant by conventional standards, is close to the significance threshold (p<0.05). In contrast, if only the husband knows that the first vaccination is at birth, the probability of the child being fully vaccinated does not significantly differ from the scenario where neither parent knows, remaining at 9.6%. This result, along with the very high p-value of 0.987, suggests that the husband's knowledge alone does not significantly impact the likelihood of the child being fully vaccinated.

Concordance (both parents sharing the knowledge), however, leads to the highest likelihood of full vaccination. When both parents know that the first vaccination should be given at birth, the probability of full vaccination is the highest at 15.6%, although this increase is also not statistically, which implies that the child is most likely to be fully vaccinated when both parents share this knowledge. In short, mother's knowledge seems to be crucial and may make a difference for vaccination status even if the father does not share this knowledge, but shared knowledge within a couple, perhaps transmitted from wife to husband, can have a strong influence on ensuring a child's full vaccination.

Norms: The perception that most children in the community are taken for routine immunizations, a subjective norm, is positively related to the likelihood of a child being fully vaccinated, albeit not at conventional levels of statistical significance. Further, who holds this norm matters less as long as at least one partner believes it. For example, if neither parent agrees with the statement that " Most parents take children to a facility for routine immunization," the likelihood of the child being fully vaccinated is the lowest at 4.9%. When only the wife agrees with the statement, the probability of full vaccination increases by 6.3 pp to 11.2% (p=.340), comparable to the likelihood when only the husband agrees with the statement (10.1%, p=.370). Again, positive concordance

appears to have the strongest effect; when both parents agree that most parents take their children for routine immunization, the probability of full vaccination increases to the highest value of 12.4% (p = 0.230).

Injunctive norms, as measured by husband's approval of childhood immunizations, also help to determine the likelihood that a child is vaccinated, increasing the probability of full vaccination by 6.4 pp from 6.5% to 12.9% (p=0.068).

Self-efficacy: In this context, self-efficacy does not appear to be an important factor influencing childhood immunizations. We estimated a slight increase in the likelihood of full vaccination when the mother agrees that it is easy to take children for vaccinations (12.2%) as compared to when she disagrees (10.9%). However, this result is not statistically significant (p=0.700).

Influencers: The presence of different influencers in the decision-making process for childhood vaccinations appears to have varying effects on the likelihood of a child being fully vaccinated, although none of the relationships are statistically significant. Health providers appear to have the most substantial positive influence, increasing the likelihood of vaccination by nearly 10 pp from 11.8% to 21.6%, although only 2% of women report them as a source of influence and the result is not statistically significant (p=.128). Husbands, cited by 85% of wives, do not have a statistically significant statistical influence on such decisions, raising the likelihood by only 1.4 pp, from 10.8% to 12.2%. The results for mothers-in-law and mothers are also not statistically significant.

Mother's age: There is a slightly higher likelihood of a child being fully vaccinated if the mother is aged 25–34 years (12.3%) or 35–49 years (12.3%) compared to those aged 15–24 years (11.4%). However, these differences are not statistically significant (P>0.05), suggesting that mother's age might not be a key determinant of whether a child is fully vaccinated.

Woman's education: Children of women with secondary or higher education have a higher likelihood (14.6%) of being fully vaccinated compared to those with no education (10.7%) or primary education (9.4%). However, the difference is not statistically significant (P>0.05), except for the comparison between no education and primary education.

Husband's education: Interestingly, the data shows that as the husband's level of education increases, the likelihood of a child being fully vaccinated decreases, from 19.3% for no education, to 11.2% for primary, 10.3% for secondary, and 9.5% for tertiary. This trend is statistically significant (P<0.05). However, this could be due to a variety of factors and warrants further investigation.

Wealth quintile: As wealth increases, there is a trend toward a higher likelihood of a child being fully vaccinated, with the highest likelihood seen in the highest wealth quintile (14.5%). However, the difference is not statistically significant (P>0.05).

Child's gender: The likelihood of a child being fully vaccinated is slightly higher for female children (12.8%) compared to male children (11.4%). However, this difference is not statistically significant (P>0.05).
In conclusion, while there are differences in the likelihood of a child being fully vaccinated based on these variables, only the husband's education level shows a statistically significant relationship. However, these results are not conclusive and could be influenced by other factors not considered in this data. Further research is needed to clarify these relationships.

From the analysis, several patterns emerge that can inform strategies to improve SBC programs to improve child vaccination rates. Firstly, discussions about immunization significantly impact a child's likelihood of being fully vaccinated, especially when the wife is part of the conversation. This underscores the crucial role of maternal engagement in child healthcare discussions. Secondly, a mother's knowledge of vaccination timing matters more

than the father's, highlighting the value of educating women about immunization schedules. However, shared parental knowledge offers the highest likelihood of a child's full vaccination, suggesting that promoting mutual understanding within couples can have a potent influence. Thirdly, community norms play a vital role in vaccination likelihood. Positive concordance about community immunization practices amongst couples, along with the husband's approval of immunization, increase the probability of a child being fully vaccinated. In terms of demographic variables, a husband's education level surprisingly shows a statistically significant inverse relationship with a child's vaccination likelihood. Lastly, while some factors like wealth quintile, mother's age, and child's gender show trends in the vaccination likelihood, they are not statistically significant and need further investigation. The overall pattern emphasizes the importance of couple communication, shared knowledge, and community norms in improving child vaccination rates.

Some possible recommendations from these results could include:

1. **Promoting immunization discussions:** The significant increase in the likelihood of full vaccination when parents, particularly wives, are involved in immunization discussions underscores the importance of fostering open dialogues about child health. SBC programs could focus on encouraging discussions within families and providing them with correct, comprehensive, and actionable information about immunizations.

2. **Strengthening maternal knowledge and engagement:** The mother's knowledge and her engagement in immunization decisions greatly influence the likelihood of a child's full vaccination. Hence, SBC initiatives should aim at empowering women with knowledge about immunization schedules and promoting their active participation in health-related decisions.

3. **Promoting shared knowledge among couples:** The highest likelihood of full vaccination is observed when both parents know that the first vaccination should be given at birth. This implies that interventions should also target men, fostering shared decision-making and mutual understanding within couples.

4. **Leveraging community norms:** Given the positive relationship between community norms and the likelihood of a child being fully vaccinated, SBC programs could harness this power by fostering a community environment supportive of vaccinations. This could involve working with local influencers, community leaders, or religious figures to promote positive norms around child immunization.

5. **Considering demographic factors:** While demographic factors like the husband's education level, wealth quintile, mother's age, and child's gender were not as impactful or were counterintuitive, they should not be overlooked. These factors can guide the segmentation and targeting strategies in SBC program design. For instance, considering the husband's education level, tailored messages or interventions may be needed for families with highly educated fathers to address any barriers to immunization.

6. **Addressing influencers:** In terms of influencers, the data suggests that health providers could potentially play a significant role, though they are underutilized. SBC programs might consider strategies to involve health providers more actively in influencing immunization decisions.

In summary, these results underscore the importance of a holistic, context-specific, and targeted approach in designing SBC programs for promoting child immunization. Fostering open dialogues, empowering women, promoting shared knowledge among couples, leveraging community norms, considering demographic nuances, and appropriately involving influencers are key strategic considerations to be taken into account.

Table 6.2.6. Logistic Regression, Routine Child Immunizations

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Mother's age					
15–24 years	1.000				11.4%
25–34 years	1.125	0.611	2.073	0.702	12.3%
35–49 years	1.121	0.480	2.615	0.790	12.3%
Woman's education					
None	1.000				10.7%
Primary	0.831	0.291	2.371	0.726	9.4%
Secondary or higher	1.667	0.772	3.599	0.190	14.6%
Islamic	1.028	0.483	2.192	0.942	10.9%
Husband's education					
None	1.000				19.3%
Primary	0.351	0.124	0.996	0.049	11.2%
Secondary	0.306	0.094	0.995	0.049	10.3%
Tertiary	0.272	0.074	0.994	0.049	9.5%
Islamic	0.721	0.256	2.030	0.531	16.5%
Wealth quintile					
Lowest	1.000				8.3%
Second	1.222	0.382	3.908	0.732	9.6%
Middle	1.050	0.224	4.919	0.950	8.6%
Fourth	1.811	0.488	6.724	0.370	12.4%
Highest	2.355	0.591	9.382	0.221	14.5%
Child's gender					
Female					12.8%
Male	0.829	0.526	1.305	0.413	11.4%
Influencers					
Partner					
No	1.000				10.8%
Yes	1.210	0.532	2.750	0.645	12.2%
Mother-in-law					
No	1.000				11.9%
Yes	1.344	0.517	3.496	0.540	14.2%
Mother					
No	1.000				12.3%
Yes	0.512	0.103	2.537	0.408	7.9%
Health Provider					
No	1.000				11.8%
Yes	3.172	0.721	13.961	0.125	21.6%
Discussion of immunization					
No one reports discussion	1.000				2.3%
Wife only	13.974	4.232	46.141	0.000	21.4%
Husband only	0.825	0.267	2.551	0.736	1.9%
Both report discussion	19.489	6.786	55.967	0.000	26.6%

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Know's first vaccination is at birth					
Neither knows	1.000				9.6%
Wife only	1.786	0.938	3.400	0.077	13.9%
Husband only	1.008	0.389	2.613	0.987	9.6%
Both know	2.172	0.875	5.391	0.093	15.6%
Most parents take children to facility for routine immunization					
Neither agree	1.000				4.9%
Wife only agrees	3.160	0.291	34.283	0.340	11.2%
Husband only agrees	2.722	0.298	24.840	0.370	10.1%
Both agree	3.750	0.427	32.956	0.230	12.4%
Husband approves of childhood immunizations					
No	1.000				6.5%
Yes	2.699	0.928	7.847	0.068	12.9%
Mother agrees that it is easy to take children for vaccinations					
No	1.000				10.9%
Yes	1.194	0.479	2.977	0.700	12.2%
State					
Kebbi	1.000				9.9%
Sokoto	0.810	0.286	2.289	0.687	8.6%
Zamfara	1.594	0.688	3.695	0.273	13.3%
Constant	0.000	0.000	0.009	0.000	12.1%
Obs	1457				
Design df	82				
F(29,158)	11.98				
Prob>F	0.000				

6.3 Acute respiratory infections

Significant gaps exist in proper treatment for children with signs of pneumonia. Among the children who were reported to have signs of pneumonia, 31% were taken for formal care, 52% were taken for informal care, and 17% reported no care. Just over a third of these children (35%) were treated with antibiotics.

Significant gaps also exist in awareness of the symptoms of pneumonia, more so among husbands than wives. More wives (62%) than husbands (47%) identified cough as a symptom of pneumonia, but only 40% of wives and 25% of husbands recognized rapid or difficult breathing as a sign of pediatric pneumonia (Table 6.3.1). State-wide variations were observed; in Zamfara, wives were twice as likely to identify rapid or difficult breathing as a symptom of pneumonia than husbands (wives: 36%, husbands: 16%). In Kebbi, more than half of wives (52%) but only a third of husbands (36%) were able to identify rapid or difficult breathing as a sign of pediatric pneumonia.

A considerable proportion of wives (40%) and husbands (49%) across all three states were unable to report or identify any effective medicine for treating pneumonia (Table 6.3.2). Overall, only 46% of wives and 40% of husbands were able to identify any antibiotic as a possible treatment for pneumonia. Awareness of antibiotics was highest among respondents in Kebbi (wives: 70%, husbands: 61%).

Most respondents (wives: 88%; husbands: 87%) were aware that pneumonia can be severe for children, possibly leading to hospitalization or death, but misconceptions persist (Table 6.3.3). Two-thirds of males (66%) and 56% of females believed that only weak children are at risk of dying from pneumonia, with similar patterns observed across the three states. However, intentions for pneumonia care-seeking and treatment are encouraging. Most respondents (wives: 91%; hubands: 91%) indicated that they would ensure that any child with pneumonia symptoms would complete a full course of antibiotics, and that they would treatment promptly for pneumonia symptoms (wives: 93%, husbands: 94%).

Awareness of ways to prevent pneumonia was generally higher among wives than among husbands (Table 6.3.4). Approximately 8 out of 10 wives but just more than half of husbands were able to identify at least one preventive behavior, with the most commonly cited behaviors being vaccinations, keeping the house and surroundings clean, using clean water, and ensuring good nutrition. Handwashing was cited by only 6% of wives and 4% of husbands.

Table 6.3.1. Reported signs and symptoms of pediatric pneumonia

Percentage of women aged 15 to 49 years with a child under 2 years reporting signs and symptoms of pediatric pneumonia

	Kebbi		Sokoto		Zamfara		Wife	Husband	P
	Wife	Husband	Wife	Husband	Wife	Husband			
	%	%	%	%	%	%	%	%	
Symptoms of pneumonia									
Fever	54.6	53.2	27.8	63.9	42.8	33.3	42.1	43.7	0.725
Chills	20.5	15.4	9.8	25.5	15.6	7.8	15.4	12.9	0.390
Headache	27.0	26.3	9.3	41.8	19.1	17.3	18.6	24.1	0.143
Body pain	24.8	23.1	10.7	26.7	19.8	12.7	18.9	17.7	0.701
Stiff neck	9.8	12.2	2.9	2.6	5.4	5.4	5.8	6.4	0.709
Wheezing	19.9	24.5	8.4	12.4	25.7	6.4	20.7	11.7	0.001
Cough	70.2	53.1	51.7	56.4	62.2	41.9	61.6	47.2	0.001
Rapid difficult breaths	52.2	36.2	37.5	37.0	36.2	16.3	39.9	24.8	0.000
Diarrhea	9.1	3.1	4.2	15.3	5.2	5.8	5.8	7.0	0.522
Vomiting	10.1	5.5	6.6	16.9	11.0	6.2	9.9	8.1	0.402
Poor appetite	10.5	3.6	6.1	10.5	5.6	1.2	6.8	3.5	0.008
Not able to eat	12.2	3.5	3.0	11.5	7.2	1.2	7.4	3.7	0.001
Tiredness	11.1	2.0	2.1	7.2	4.8	1.3	5.5	2.6	0.003
Restless	19.4	9.4	6.2	23.9	15.6	3.5	14.4	8.8	0.022
Bitter taste in mouth	7.9	1.0	0.3	1.6	2.6	1.0	3.3	1.1	0.001
Blisters in mouth	6.5	0.7	0.4	0.9	0.5	0.2	1.8	0.4	0.001
Convulsions	6.1	3.2	1.6	0.8	1.8	2.0	2.7	2.0	0.367
Unconscious	5.2	3.8	0.6	0.2	1.5	0.8	2.1	1.4	0.283
Dizziness	5.9	2.6	2.3	1.1	3.0	2.3	3.4	2.1	0.209
Crying all the time	20.8	13.6	4.9	10.2	18.7	4.8	16.1	7.8	0.001
Death	5.7	0.7	0.3	0.3	1.5	0.6	2.1	0.5	0.000
Paleness in face	11.9	4.2	0.0	0.8	7.0	0.7	6.5	1.5	0.000
Painful ribs	22.0	18.1	18.6	11.1	17.1	2.9	18.5	7.9	0.000
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 6.3.2. Perceived treatment effectiveness against pneumonia

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years reporting which medicines are effective to treat pneumonia

| | Kebbi | | Sokoto | | Zamfara | | | | |
| | Wife | Husband | Wife | Husband | Wife | Husband | Wife | Husband | P |
	%	%	%	%	%	%	%	%	
Effective medicine to treat pneumonia									
Amoxicillin	65.7	60.1	29.2	54.8	39.9	22.2	43.0	37.0	0.217
Cotrimoxazole	20.9	18.7	2.1	16.3	20.3	9.2	16.5	12.7	0.305
Other antibiotics	0.3	0.1	0.4	0.3	1.0	0.4	0.7	0.3	0.064
Any antibiotic	**70.0**	**61.0**	**31.3**	**56.7**	**43.3**	**27.0**	**46.4**	**40.4**	0.253
Anti-malarial	18.0	9.5	3.8	13.3	8.5	6.2	9.5	8.3	0.686
ORS	2.6	25.8	1.8	25.5	3.1	7.0	2.7	14.8	0.000
Other	8.8	3.5	17.0	3.4	4.8	2.2	8.3	2.8	0.000
Don't Know	18.5	22.3	47.3	28.9	45.5	65.8	40.2	48.9	0.079
N	1,088	1,065	1,045	841	1,011	958	3144	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 6.3.3. Pneumonia-related beliefs, intentions and self-efficacy

Percentage of women aged 15 to 49 years with a child under 2 years reporting certain pneumonia-related beliefs, intentions and self-efficacy

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wives %	Husband %	P
Child can get severely ill from pneumonia (hospitalized or death)	94.8	83.3	86.9	93.8	85.4	86.3	87.7	87.1	0.392
Only weak children die of pneumonia	55.7	68.1	44.9	68.7	60.3	65.1	56.0	66.5	0.006
Most women go to traditional provider for pneumonia symptoms	81.5	84.1	75.9	75.4	75.7	89.2	77.0	85.4	0.000
Antibiotics are most effective treatment for pneumonia	81.0	75.7	55.9	84.0	72.7	66.6	70.9	72.0	0.864
Likelihood to complete antibiotic course for pneumonia symptoms	94.2	87.0	81.7	91.6	94.0	93.0	91.4	91.4	0.013
Likelihood to seek care same/next day for pneumonia symptoms	95.3	88.2	83.9	89.0	96.1	98.1	93.3	94.1	0.058
Child can get severely ill from pneumonia (hospitalized or death)	94.8	83.3	86.9	93.8	85.4	86.3	87.7	87.1	0.392
N	1,083	1,065	1,032	841	986	958	3101	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 6.3.4. Reported ways to prevent pediatric pneumonia

Percentage of women aged 15 to 49 years with a child under 2 years reporting ways to prevent pediatric pneumonia

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	P
Things to prevent pneumonia Ensure child vaccinated	24.7	27.7	15.8	37.6	16.4	32.9	18.1	32.6	0.000
Use toilet/no open waste	11.5	9.8	1.7	15.3	5.9	8.9	6.2	10.3	0.024
Keep house /surroundings clean	28.7	22.7	8.1	34.7	21.9	17.7	20.4	22.1	0.673
Only breastmilk first 6 months	5.3	11.2	2.7	7.0	2.4	5.0	3.1	6.8	0.004
Safe storage of drinking water	10.6	9.5	4.9	29.7	5.6	5.0	6.5	10.8	0.028
Don't give dirty water	11.5	8.5	10.7	29.5	6.2	4.3	8.3	10.1	0.322
Don't eat bad food	12.9	12.2	1.9	13.9	2.1	2.0	4.3	6.6	0.109
Good nutrition	16.3	18.3	6.9	19.5	6.6	4.3	8.7	10.4	0.385
Handwashing	9.0	2.6	5.5	10.8	5.0	2.4	6.0	4.1	0.183
Proper disposal of infant stool	5.6	4.2	2.5	5.8	3.6	0.7	3.8	2.5	0.184
Know any way	**92.4**	**63.2**	**65.5**	**70.2**	**79.2**	**48.5**	**79.0**	**56.0**	0.000
N	1,088	1,065	1,045	841	1,011	958	3144	2864	

P val refers to significance test across all three states combined of H$_o$: mean value for wives = mean for husbands

Multivariate Results: Formal sector treatment for symptoms of pneumonia

We examined factors that potentially influence the decision to take a child with symptoms of pneumonia- short rapid breaths or difficulty breathing, to a formal health care provider.[4]

Decision-making: The results on who decides to seek care when a child is ill (as reported by the wife) and its relationship with the likelihood of seeking care when a child has symptoms of pneumonia, shows the value of

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[4] Includes a government hospital, a government primary health care center, a dispensary/health post, a community health outreach, a nursing/maternity home or a private hospital or clinic.

joint decision-making but also the predominant role of husbands in such decisions. When the wife is the principal decision-maker about care-seeking, less than one in five children is taken for formal care. If it's mainly the partner's decision to seek care, the adjusted probability of seeking formal care increases to 27.7%. While this is a substantial increase, it does not reach statistical significance (p=0.203). In contrast, when both partners decide together to seek care, the likelihood that a child was taken for formal care jumps to 41.0% (p=.002), suggesting that the involvement of both partners in the decision-making process substantially increases the likelihood that a child with symptoms of an acute respiratory infection or pneumonia will receive formal care.

Influences: The influence of different people on the wife's decision to seek care appears to have varying effects on the likelihood of a child being taken to a formal sector health care provider. The only statistically significant finding is the influence of the mother-in-law. If the mother-in-law influences the decision, the likelihood drops significantly to 12.6% from 36.1% (p=0.004). This could suggest that mothers-in-law might, in some cases, advocate for non-formal care options, or possibly delay the decision to seek care. There are several socio-cultural factors that might explain this. For example, older generations may be more likely to rely on traditional remedies or hesitate to seek formal medical care. Alternatively, it could reflect power dynamics within families that could hinder immediate care-seeking.

If the husband/partner influences the wife's decision, the likelihood that the child was taken for formal care is 33.4%, compared to 35.6% when the partner does not influence the decision. This decrease is not statistically significant (p=0.875). Mothers and friends are also not statistically important influencers on care seeking.

The slight decrease in care-seeking when the partner is the influencer could suggest that shared decision-making is not effectively taking place, or the partner's influence might not be in favor of formal care. However, without knowing the specific context or having more granular data, it's challenging to provide an exact interpretation.

ARI knowledge and attitudes: The wife's knowledge and beliefs seem to be more influential in deciding to seek formal care for a child with ARI symptoms, again possibly due to her primary role in child caregiving. The results indicate a few notable patterns in how knowledge about Acute Respiratory Infection (ARI) and its treatment held by either spouse can influence the likelihood of a child with ARI symptoms being taken to a formal health care provider.

For example, regarding knowledge of ARI symptoms, the wife's knowledge made a significant difference. When the wife knew the symptoms of ARI, the probability of seeking formal care significantly increased by 21 pp, from 15% to 35.9% (p=0.002), while the husband's knowledge did not significantly alter the likelihood. The difference in the likelihood of seeking care if the husband knows the symptoms of ARI (33.7%) was only 2 pp higher than if he did not know the symptoms (31.9%, p=0.847). This suggests that the wife's knowledge of ARI symptoms is more crucial in seeking formal care.

Knowledge of antibiotics appears to be negatively related to care-seeking, although these results are not statistically significant. For example, when neither spouse knows about these antibiotics, the probability of care-seeking is 38.3%. If only the wife knows, the probability decreases slightly to 35.2% (p=0.682), and if only the husband knows, it decreases further to 30.1% (p=0.386). These changes are not statistically significant. Inexplicably, when both know, the probability decreases more substantially to 28.5% (p=0.327), but this is also not statistically significant.

Trust in treatment efficacy does not appear to be important. The likelihood of care-seeking is nearly identical if both partners agree that antibiotics are the most effective treatment for pneumonia (34.6%) as when both partners disagree with this statement (35.3%, p=.954).

In summary, the wife's knowledge about ARI symptoms stands out as a significant factor in seeking formal care, while the other factors, including knowledge about antibiotics and belief in their efficacy, do not appear to significantly impact the decision, regardless of whether the husband, wife, or both have this knowledge or belief. This could possibly be due to the primary role women often play in the healthcare decisions of children. Additionally, it seems that the knowledge and belief of both spouses does not necessarily increase the likelihood

of seeking formal care beyond the influence of the wife alone. This might suggest that the wife's role and knowledge in health care decisions may be more influential or perhaps that there is a ceiling effect in knowledge increasing healthcare-seeking behavior.

Norms: Breakthrough ACTION/Nigeria works to help couples recognize the symptoms of pneumonia and to seek treatment from a formal sector healthcare provider, when antibiotics can be obtained, if necessary, as opposed to taking a child to a traditional or informal provider. In this case, a couple's concordance on this subjective norm seems to be important. If both the husband and the wife reject the norm that most people use traditional providers for pneumonia symptoms, the likelihood of choosing the alternative – going to a formal provider—is highest, at 69.5%. The opposite scenario, when both husband and wife agree that most people use a traditional provider has the lowest associated likelihood (30.1%, p=.001). Interestingly, if only the wife agrees with the norm, the adjusted probability decreases significantly to 33.9%, and this result is statistically significant (p=0.003). This substantial decrease in the probability suggests that when the wife is inclined toward traditional providers, the likelihood of seeking formal care drops dramatically.

When only the husband agrees with the norm, the adjusted probability also decreases, but not as much as when the wife agrees- it reduces to 42.3%, and this result is statistically significant (p=0.015). Although this decrease is also substantial, it is less than when only the wife agrees, suggesting that the wife's opinion might carry more weight in this matter.

Self-efficacy: When the wife is not confident in her ability to persuade her husband to seek care for pneumonia symptoms, the adjusted probability of seeking formal healthcare is 29.7%. If the wife is confident, the probability increases slightly to 33.7%. However, this difference is not statistically significant (p=0.615), suggesting that the wife's confidence level does not significantly influence the likelihood of seeking formal care specifically for pneumonia symptoms.

In contrast, when considering the wife's confidence in convincing her husband to seek care when the child is sick in general, there is a significant difference. When the wife lacks confidence, the probability of seeking formal care is quite low at 13.7%. However, when she is confident, the likelihood increases dramatically to 34.4%. This increase is statistically significant (p=0.031), demonstrating that the wife's self-efficacy does play a substantial role in seeking formal healthcare when the child is sick in general.

Interestingly, the wife's confidence has a more significant effect on seeking formal care for a sick child in general, but not as much when the child displays pneumonia symptoms specifically. This discrepancy may result from factors such as the perceived severity of the illness, the family's understanding of pneumonia, or cultural and societal attitudes toward pneumonia in this region. It is possible that there may be a lack of understanding or awareness of the severity of pneumonia symptoms, leading to decreased urgency to seek formal healthcare, regardless of the wife's confidence. However, this possibility seems unlikely. Nearly nine out of ten husbands and wives agreed that a child can get severely ill from pneumonia, including hospitalization or death.

Another potential explanation could be the nature of the confidence expressed. The wife's confidence in convincing her husband to seek care when a child is sick "in general" could reflect her overall confidence in making health-related decisions, which may not extend to specific illnesses such as pneumonia. This suggests that SBC interventions to improve child health might want to aim not just to increase mothers' general confidence in their ability to make health-related decisions, but also to enhance both parents' understanding of specific illnesses and their severity.

Discussions about care-seeking for child illnesses: The results show a clear pattern. When neither the wife nor the husband reports discussing care seeking for childhood illnesses, the probability of the child being taken to a formal health care provider is the lowest, at 17.9%. However, if the wife reports such a discussion independently, this probability increases significantly to 28.7%, suggesting that the wife's individual discussions may have some influence on the decision to seek formal health care for the child. However, this result is not statistically significant (p=0.210). When only the husband reports discussing care seeking, the likelihood of taking the child for formal care slightly increases to 22.1%. This increase is also not statistically significant (p=0.627), suggesting that the

husband's independent reporting of discussions may not have a substantial impact on the decision to seek formal health care.

The most striking result comes when both the wife and husband report discussing care seeking. In this case, the probability of the child being taken to formal care significantly increases to 43.8%. This result is statistically significant (p=0.010), suggesting a robust association between joint discussions about care seeking within the couple and the decision to take the child to a formal health care provider. In terms of which member of the couple's reporting matters more, these findings suggest that the joint reporting by both wife and husband has the most substantial impact. However, even when not statistically significant, the wife's reporting seems to lead to a higher probability of formal care-seeking than the husband's reporting.

These findings are in line with expectations. Since mothers generally have primary responsibility for childcare, it is possible that a wife's decisions and actions could be more directly linked to child health outcomes. However, joint discussions within the couple could represent a shared commitment and understanding of the importance of formal health care in managing childhood illnesses, which in turn, leads to higher care-seeking behavior.

Other factors:

1. **Mother's age**: Mother's in the youngest age group (15–24 years) have the highest adjusted probability of seeking formal care (38.9%). Mothers aged 25–34 have a lower probability (27.4%, p=0.065), which is not statistically significant but near the threshold. Mothers aged 35–49 have a likelihood of 37.5% (p=0.841), which is not significantly different from the youngest age group.

2. **Woman's education**: Interestingly, women with no education have the highest probability (48.6%) of seeking formal care. This probability decreases to 29.8% for those with primary education (p=0.102), and slightly increases to 44.3% for those with secondary or higher education (p=0.656). However, women with Islamic education have a significantly lower probability (24.2%, p=0.007).

3. **Husband's education**: Husband's education is positively and significantly associated with seeking formal care. The probability is lowest for those with no education (18.1%), and significantly increases with secondary education (42.1%, p=0.005), tertiary education (34.7%, p=0.139, not statistically significant), and Islamic education (34.5%, p=0.029).

4. **Wealth quintile**: The likelihood of seeking care does not consistently increase or decrease across wealth quintiles, and none of the differences from the lowest quintile are statistically significant. The lowest quintile has a probability of 35.6%, the second quintile increases slightly to 39.4% (p=0.586), and then the likelihood decreases for the middle (32.5%, p=0.748) and fourth quintiles (26.5%, p=0.395). The highest quintile is almost equivalent to the lowest (35.3%, p=0.974). The lack of a clear pattern across wealth quintiles might suggest that financial resources are not a deciding factor for healthcare-seeking behavior.

Table. 6.3.5 Logistic Regression. Formal sector treatment seeking for symptoms of pneumonia

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Mother's age					
15–24 years	1.000				38.9%
25–34 years	0.498	0.237	1.046	0.065	27.4%
35–49 years	0.925	0.427	2.003	0.841	37.5%
Woman's education					
None	1.000				48.6%
Primary	0.332	0.088	1.251	0.102	29.8%
Secondary or higher	0.788	0.272	2.282	0.656	44.3%
Islamic	0.226	0.078	0.654	0.007	24.2%
Husband's education					
None	1.000				18.1%
Primary	2.064	0.697	6.114	0.188	28.1%
Secondary	4.728	1.619	13.808	0.005	42.1%
Tertiary	3.086	0.688	13.837	0.139	34.7%
Islamic	3.051	1.126	8.264	0.029	34.5%
Wealth quintile					
Lowest	1.000				35.6%
Second	1.239	0.568	2.700	0.586	39.4%
Middle	0.830	0.262	2.625	0.748	32.5%
Fourth	0.573	0.157	2.093	0.395	26.5%
Highest	0.982	0.326	2.962	0.974	35.3%
Child's qender					
Female	1.000				36.5%
Male	0.676	0.320	1.430	0.301	30.0%
Whose decision is it to seek care?					
Mainly my decision	1.000				19.1%
Mainly my partner's decision	1.843	0.714	4.762	0.203	27.7%
Both decide together	3.991	1.723	9.242	0.002	41.0%
Influencers					
Partner					
No	1.000				35.6%
Yes	0.873	0.156	4.892	0.875	33.4%
Mother-in-law					
No	1.000				36.1%
Yes	0.180	0.058	0.562	0.004	12.6%
Mother					
No	1.000				32.7%
Yes	1.414	0.425	4.701	0.567	38.7%
Friends					
No	1.000				33.4%
Yes	1.073	0.136	8.485	0.946	34.6%
Discussion of care seeking					
No one reports discussion	1.000				17.9%
Wife only	2.144	0.644	7.139	0.210	28.7%
Husband only	1.386	0.365	5.261	0.627	22.1%
Both report discussion	5.030	1.502	16.839	0.010	43.8%

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Facilities in my community often have needed treatment					
Neither agree	1.000				40.4%
Wife only agrees	0.553	0.123	2.488	0.435	30.5%
Husband only agrees	1.037	0.205	5.232	0.965	41.0%
Both agree	0.627	0.146	2.694	0.525	32.5%
Knows antibiotics that can treat ARI					
Neither knows	1.000				38.3%
Wife only	0.831	0.339	2.038	0.682	35.2%
Husband only	0.611	0.199	1.883	0.386	30.1%
Both know	0.549	0.163	1.845	0.327	28.5%
Husband knows symptoms of ARI					
No	1.000				31.9%
Yes	1.112	0.373	3.311	0.847	33.7%
Wife knows symptoms of ARI					
No	1.000				15.0%
Yes	4.438	1.782	11.048	0.002	35.9%
Most women go to traditional provider for pneumonia					
Neither agree	1.000				69.5%
Wife only agrees	0.134	0.036	0.498	0.003	33.9%
Husband only agrees	0.215	0.063	0.734	0.015	42.3%
Both agree	0.106	0.030	0.373	0.001	30.1%
Antibiotics are most effective treatment for pneumonia					
Neither agree	1.000				35.3%
Wife only agrees	0.517	0.129	2.072	0.346	24.7%
Husband only agrees	1.271	0.277	5.837	0.755	39.5%
Both agree	0.962	0.250	3.696	0.954	34.6%
Confident to convince husband to seek care for pneumonia symptoms					
No	1.000				29.7%
Yes	1.279	0.485	3.372	0.615	33.7%
Confident to convince husband to seek care when child is sick in general					
No	1.000				13.7%
Yes	4.568	1.151	18.136	0.031	34.4%
State					
Kebbi	1.000				29.6%
Sokoto	5.356	1.903	15.074	0.002	59.3%
Zamfara	0.836	0.307	2.278	0.723	26.8%
Constant	0.069	0.002	2.274	0.132	33.5%
Obs	348				
Design df	70				
F(41,30)	2.07				
Prob>F	0.020				

6.6 Diarrheal diseases

Awareness of the possible severity of diarrhea for children and of effective treatments appeared to be high across all three states. Husbands and wives were equally likely to be able to identify at least one way to prevent children from getting diarrhea (wives: 91%, husbands 91%) but they often differed in reporting specific ways. Almost 57% of wives identified "keeping the house and surroundings clean" as the principal way, as comared with 42% of husbands. Husbands were more likely to report vaccinations as a way to prevent diarrhea (wives: 19%, husbands 31%). Only 28% of wives and 19% of husbands cited handwashing, and less than one in ten husbands and wives cited giving only breastmilk for the first six months of life.

Most wives (76%) and husbands (78%) knew about ORS as a treatment for diarrhea, but significantly more wives (61%) than husbands (41%) were able to recall that zinc is an effective treatment for diarrhea (Table 6.6.2). Nearly all husbands (96%) and wives (96%) could name at least one way that ORS helps children with diarrhea, with replacing lost water being the main reason cited (wives: 76%, husbands: 68%) (Table 6.6.3). Only about a third of husbands and wives specifically mentioned that ORS can prevent dehydration and only a fifth mentioned that it can replace salts and electrolytes. The majority of wives and husbands also were able to cite at least one benefit of zinc for children with diarrhea.

Most husbands (91%) and wives (93%) are awared that diarrhea can lead to dehydration and death, but only three quarters know how to prepare ORS for treatment of diarrhea (Table 6.6.5). Most husbands and wives indicated that they would engage in beneficial behaviors (e.g., continuing to breastfeed, giving a child ORS or giving a child zinc) but respondents were only presented with correct options and it is hard to know if agreement reflects correct knowledge or courtesy bias, particularly after a series of questions about the benefits of ORS and zinc.

Table 6.6.1. Reported ways to prevent a child from getting diarrhea

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting ways to prevent pediatric diarrhea

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	p val
Ensure child is vaccinated	23.6	36.0	16.6	32.1	17.6	28.9	18.7	31.1	**.002**
Use toilet/no open waste	41.4	27.8	5.9	24.8	33.0	18.1	28.9	21.6	.052
Keep house/ surroundings clean	59.8	32.9	29.3	59.2	65.8	39.6	56.7	41.9	**.000**
Only breastmilk for first 6 months	9.0	13.5	4.7	7.0	7.6	9.3	7.3	9.8	.178
Safe storage of drinking water	37.3	18.5	15.2	36.8	24.1	18.3	25.0	21.9	.381
Don't give dirty water	52.5	NA	35.5	NA	42.9	NA	43.3	NA	**NA**
Don't eat bad food	38.2	39.1	23.6	38.6	38.0	33.7	34.9	35.8	.860
Good nutrition	24.8	22.9	12.2	22.2	10.8	14.8	14.1	18.1	.158
Handwashing	29.3	6.4	19.3	20.5	31.2	23.7	28.2	19.2	**.027**
Proper disposal of infant stool	30.3	10.2	9.8	5.3	19.9	3.4	19.9	5.3	**.000**
At least one correct	96.7	81.3	80.1	87.9	93.5	96.1	91.3	91.2	**.969**
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 6.6.2. Treatments perceived as effective against pediatric diarrhea

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting effective treatments for pediatric diarrhea

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	p val
ORS	80.1	84.0	70.2	70.1	75.8	78.3	75.5	78.0	.548
Zinc	67.9	45.7	41.5	39.0	64.9	40.5	60.5	41.4	**.000**
Breastmilk	22.0	10.1	3.0	13.2	12.4	1.0	12.4	5.4	**.001**
Other fluids	2.3	0.6	3.1	4.4	0.6	0.2	1.5	1.1	.498
Antibiotics	31.3	18.9	20.0	43.6	35.8	10.1	31.4	18.5	**.004**
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 6.6.3. Reported ways ORS may help a child with diarrhea

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting ways ORS may help a child with diarrhea

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	p val
Never heard of it	7.8	6.6	5.4	2.9	2.1	3.2	4.0	3.9	.913
Replace lost water	73.8	76.0	63.8	67.5	81.3	65.4	75.9	68.2	.062
Stops diarrhea	44.0	40.6	28.0	73.7	47.0	31.4	42.3	41.6	.875
Prevents dehydration	48.2	50.1	11.9	32.6	39.0	19.9	35.1	29.1	.119
Replaces salts & electrolytes	36.0	28.5	4.1	25.0	21.8	11.8	21.0	18.1	.476
Restores energy	32.2	49.5	21.3	52.9	39.6	19.6	34.1	32.8	.782
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Table 6.6.4. Reported ways zinc may help a child with diarrhea

Percentage of women aged 15 to 49 years with a child under 2 years and their husbands reporting ways zinc may help a child with diarrhea

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	p val
Never heard of it	10.5	12.2	19.5	9.5	14.6	21.0	14.8	16.8	.523
Replace lost water	46.2	55.6	29.0	57.6	48.7	29.5	44.0	40.8	.431
Stops diarrhea	50.5	28.1	29.9	67.1	58.0	39.0	50.4	41.9	.054
Prevents dehydration	35.9	37.1	8.3	35.5	33.5	14.8	28.6	23.8	.221
Replaces salts & electrolytes	30.7	19.0	0.6	11.8	4.3	5.2	9.1	9.6	.811
Restores energy	37.9	38.4	12.7	46.8	29.3	7.9	27.6	22.2	.153
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 6.6.5. Diarrhea-related beliefs, intentions, and self-efficacy

Percentage of women aged 15 to 49 years with a child under 2 years reporting certain diarrhea-related beliefs, intentions, and self-efficacy

	Kebbi		Sokoto		Zamfara		Total		
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	p val
It is common for children to get diarrhea in this community	72.2	64.3	78.3	60.6	67.5	75.8	70.8	70.3	.932
Diarrhea can lead to dehydration & death	97.5	87.7	92.5	93.3	91.2	91.0	92.8	90.7	.160
I know how to prepare ORS	62.2	82.4	71.3	83.0	81.4	75.0	75.1	78.2	.064
Likelihood to continue breastfeeding during next diarrhea	92.0	NA	89.2	NA	88.7	NA	96.8	NA	-
Likelihood to give child ORS for next diarrhea episode	93.0	89.2	88.7	93.9	95.5	90.7	93.5	91.0	.103
Likelihood to give child zinc for next diarrhea episode	88.6	83.9	82.1	88.9	93.2	82.2	89.8	83.9	**.024**
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Multivariate Results: Treatment of diarrhea with ORS/Zinc

Because we just examined factors that potentially influence the decision to take a child with symptoms of pneumonia to a formal health care provider, we present here factors associated with whether a child receives appropriate treatment for diarrhea. The World Health Organization recommends a treatment protocol to prevent dehydration and nutritional damage by providing the child with ORS, zinc supplements, continued feeding (particularly breastmilk for children who are still breastfeeding), and additional fluids as appropriate. We look here at factors associated with whether a child with diarrhea receives both ORS and zinc.

Decision-making: The likelihood of a child with diarrhea being given both ORS and zinc varies slightly based on who makes the decision to seek care for the ill child. When the decision to seek care is primarily the mother's ("Mainly my decision"), the adjusted probability that the child with diarrhea receives both ORS and zinc is 21.3%. However, when the decision to seek care is mainly the partner's, the adjusted probability that the child receives both ORS and zinc increases slightly to 24.6% but is not statistically significant (p=.754). When there is joint decision making, that is both partners decide together, the adjusted probability is highest at 25.3%. However, similar to the previous case, the P value of 0.657 indicates that this difference is not statistically significant.

Diarrhea knowledge and attitudes: The results suggest that the wife's knowledge and beliefs about diarrhea treatment have a stronger association with the likelihood of the child receiving ORS and zinc than the husband's.

When examining knowledge of ORS for diarrhea treatment, the likelihood of a child receiving both treatments is highest when both parents agree that ORS is effective, at 30.0%. When only the wife agrees, the probability reduces to 19.4%, and if only the husband agrees, it further reduces to 10.9%, the lowest of these categories. The pattern is less clear regarding the belief in antibiotics as an effective treatment.

In terms of knowledge about zinc as a treatment for diarrhea, there's a striking difference between the genders. If the wife alone knows, the probability of the child receiving both treatments shoots up to 41.0%, the highest value observed in this table. This is contrasted with the low probability of 15.5% when only the husband knows. If both parents know, the probability is at a moderate 21.6%.

As for the number of ways that zinc can help with diarrhea, the husband's knowledge does not appear to significantly affect the likelihood of treatment. Whether the husband knows 0, 1, 2, or 3+ ways, the probabilities remain in the range of 21.6% to 27.3%. However, the wife's knowledge in this area is associated with a clear increase in the likelihood of the child receiving both treatments: 11.1% with 0 known ways, up to 29.5% when she knows 3 or more ways.

These results also highlight the importance of improving women's health literacy, as misinformation, such as the belief in antibiotics for diarrhea treatment, may have a detrimental effect on treatment practices.

Norms: Regarding beliefs about treatment availability in local facilities, the probability of a child receiving both treatments is highest when both husband and wife believe in the efficacy of the facilities (26.7%). If only the wife believes, the likelihood decreases to 17.9%, and if only the husband believes, the probability is 21.9%. When neither parent believes, the likelihood of treatment is 20.4%. However, none of these results is statistically significant.

In terms of the belief about the commonality of diarrhea in the community, the probability that a child receives ORS and zinc for diarrhea is highest when only the wife agrees with the statement (29.3%). If both parents agree, the likelihood decreases slightly to 22.2%, similar to the baseline probability when neither parent agrees (22.5%). The probability is almost the same (23.2%) if only the husband agrees. Again, these results are not statistically significant.

Even though these findings are not statistically significant, they still offer some interesting insights. The wife's beliefs appear to have more influence on the likelihood of the child receiving the recommended treatment.

However, when both parents hold the same beliefs, the probability of a child receiving treatment increases, suggesting that agreement between parents may be important for child health outcomes.

It is also notable that beliefs about the prevalence of diarrhea in the community do not significantly change the likelihood of a child receiving treatment. This could imply that parents' decisions may be more influenced by their knowledge about treatment options and their faith in healthcare services than by their perceptions of the prevalence of the condition. This could be an important point to consider for diarrhea SBC programming, where the focus should be not only on raising awareness about common health issues but also on improving understanding of effective treatment options and trust in healthcare services.

Self-efficacy: There is a substantial 14 percentage point difference in the adjusted probabilities when the wife is confident in her ability to convince her husband. In situations where the wife does not feel confident to convince her husband to seek care when the child is ill, the likelihood of the child receiving both ORS and zinc treatment is only 11.0%. However, this probability more than doubles to 25.1% when the wife does feel confident in her ability to convince her husband. This suggests that the wife's self-efficacy plays a crucial role in the health-seeking behavior of the family, potentially having a direct impact on the child's health outcomes.

While this result is not statistically significant (P=0.105), it still suggests a positive relationship between a woman's self-efficacy and the likelihood of the child receiving the recommended treatment, underscoring the importance of empowering women in their roles as caregivers and decision-makers in the family, as their self-efficacy in these roles can impact child health.

Discussions about care-seeking for child illnesses: When no one reports having a discussion, the probability of a child receiving both treatments is 29.6%. When only the wife reports having a discussion, the probability slightly decreases to 27.1%. If the husband is the only one who reports having a discussion, the probability further reduces to 16.6%, which is notably the lowest likelihood among all groups. However, when both the wife and husband report having a discussion, the probability increases to 25.4%, but is still lower than when no one reports having a discussion.

While none of the results are statistically significant, the pattern suggests that having a discussion, especially when it is only the husband reporting it, is associated with lower likelihood of the child receiving both treatments. This finding may serve as a counter to the hypothesis that increased communication within the couple would lead to higher chances of the child receiving treatment. However, these results also highlight the importance of corroborative reporting in health-related discussions. It is possible that discrepancies in reporting indicate communication gaps or other issues within the family that could impact decision-making about treatment.

In contrast, the high probability when no one reports a discussion may suggest that some care-seeking behaviors occur without explicit discussion or are so routine they aren't perceived as needing discussion. Further research would be needed to explore these dynamics more fully.

Influencers: The likelihood of a child receiving ORS and zinc increases when the partner is involved in the decision-making process. When the husband is involved, the probability increases from 19.4% to 25.0%. The involvement of the mother-in-law in decision making slightly increases the probability of a child getting ORS and zinc from 24.4% to 27.4%. Conversely, when the child's mother is involved in decision-making, the probability of the child receiving both ORS and zinc is slightly lower at 21.6%, compared to 25.0% when the mother is not involved. None of these findings are statistically significant but do generally accord with hypotheses the influence of family dynamics on health-related decision-making in this region.

Mother's age: The likelihood of a child being given ORS and zinc decreases with the mother's age. Mothers aged 25–34 years have a 23.4% probability and mothers aged 35–49 years have a 23.5% probability compared to mothers aged 15–24 years with a 27.7% probability. However, these differences are not statistically significant.

Education of the mother: Mothers with a secondary or higher education are more likely (31.3% probability) to administer ORS and zinc than those without any education (25.2% probability). However, this result is not statistically significant. Mothers with primary education and Islamic education are slightly less likely to administer ORS and zinc than uneducated mothers, but again these results are not statistically significant.

Education of the husband: The likelihood of the child receiving ORS and zinc is positively associated with the husband's education level (except for tertiary education). The likelihood is highest for children of fathers with secondary education (30.2%) while children whose fathers have no education have a 22.8% likelihood. However, none of these results are statistically significant.

Wealth quintile: Children from the second quintile are most likely (30.2% probability) to receive ORS and zinc treatment compared to those from the lowest quintile (21.3% probability), but this result is not statistically significant. Interestingly, the likelihood of receiving ORS and zinc does not consistently increase with wealth. The highest quintile has a slightly lower probability (19.6%) than the lowest quintile.

Child's gender: Girls are more likely (26.7% probability) to be given ORS and zinc than male children (22.9% probability). This result is also not statistically significant.

Table 6.6. Logistic regression, Treatment of child's diarrhea with ORS and zinc

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Mother's age					
15–24 years	1.000				27.7%
25–34 years	0.728	0.358	1.482	0.377	23.4%
35–49 years	0.732	0.319	1.678	0.457	23.5%
Woman's education					
None	1.000				25.2%
Primary	0.771	0.298	1.992	0.587	21.8%
Secondary or higher	1.547	0.366	6.541	0.549	31.3%
Islamic	0.883	0.372	2.093	0.774	23.5%
Husband's education					
None	1.000				22.8%
Primary	1.399	0.379	5.155	0.610	27.3%
Secondary	1.719	0.679	4.348	0.249	30.2%
Tertiary	0.827	0.192	3.555	0.796	20.4%
Islamic	1.031	0.517	2.057	0.930	23.2%
Wealth quintile					
Lowest	1.000				21.3%
Second	1.937	0.965	3.889	0.063	30.2%
Middle	1.399	0.564	3.472	0.464	25.7%
Fourth	1.536	0.624	3.783	0.346	26.9%
Highest	0.870	0.281	2.692	0.807	19.6%
Child's gender					
Female	1.000				26.7%
Male	0.750	0.485	1.159	0.192	22.9%
Whose decision is it to seek care?					
Mainly my decision	1.000				21.3%
Mainly my partner's decision	1.295	0.252	6.657	0.754	24.6%
Both decide together	1.362	0.342	5.426	0.657	25.3%
Influencers					
Partner					
No	1.000				19.4%
Yes	1.561	0.367	6.641	0.542	25.0%
Mother-in-law					
No	1.000				24.4%
Yes	1.246	0.551	2.819	0.594	27.4%
Mother					
No	1.000				25.0%
Yes	0.768	0.276	2.132	0.608	21.6%
Discussion of care seeking					
No one reports discussion	1.000				29.6%
Wife only	0.842	0.381	1.861	0.667	27.1%
Husband only	0.362	0.140	0.938	0.037	16.6%
Both report discussion	0.746	0.321	1.732	0.490	25.4%

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Knows ORS for treatment of diarrhea					
Neither agree	1.000				25.7%
Wife only agrees	0.619	0.153	2.507	0.497	19.4%
Husband only agrees	0.269	0.066	1.092	0.066	10.9%
Both agree	1.345	0.328	5.509	0.677	30.0%
Knows zinc as treatment for diarrhea					
Neither knows	1.000				7.9%
Wife only	12.578	5.061	31.255	0.000	41.0%
Husband only	2.370	0.622	9.020	0.203	15.5%
Both know	3.848	1.400	10.579	0.010	21.6%
Believes antibiotics are effective for treatment of diarrhea					
Neither knows	1.000				26.6%
Wife only	0.538	0.262	1.103	0.090	18.7%
Husband only	0.959	0.421	2.181	0.919	26.0%
Both know	1.119	0.317	3.949	0.860	28.2%
Number of ways that zinc can help with diarrhea as identified by wife					
0	1.000				11.1%
1	3.231	1.113	9.381	0.031	24.1%
2	4.284	1.379	13.309	0.013	28.2%
3+	4.677	1.554	14.078	0.007	29.5%
Number of ways that zinc can help with diarrhea as identified by husband					
0	1.000				27.3%
1	0.808	0.320	2.038	0.647	24.4%
2	0.653	0.283	1.507	0.313	21.6%
3+	0.811	0.309	2.132	0.668	24.4%
Believes facilities in my community have treatment needed for sick children					
Neither					20.4%
Wife only	0.807	0.212	3.073	0.750	17.9%
Husband	1.125	0.341	3.713	0.845	21.9%
Both	1.622	0.607	4.338	0.331	26.7%
It is common for children to get diarrhea in this community					
Neither agree	1.000				22.5%
Wife only agrees	1.659	0.476	5.790	0.422	29.3%
Husband only agrees	1.056	0.277	4.022	0.935	23.2%
Both agree	0.978	0.274	3.485	0.972	22.2%
Knows how to prepare ORS					
Neither	1.000				32.0%
Wife only	0.318	0.062	1.623	0.166	16.9%
Husband	0.458	0.134	1.560	0.208	21.2%
Both	0.786	0.267	2.310	0.658	28.4%

	Odds ratio	[95% conf.	interval]	P	Pr(Y=1)
Confident to convince husband to seek care when child is sick in general					
No	1.000				11.0%
Yes	3.664	0.757	17.725	0.105	25.1%
State					
Kebbi	1.000				32.1%
Sokoto	1.423	0.513	3.952	0.493	37.3%
Zamfara	0.306	0.125	0.748	0.010	16.9%
Constant	0.010	0.001	0.195	0.003	24.7%
Obs	569				
Design df	81				
F(49,33)	6.06				
Prob>F	0.020				

6.7 Child health ideations

Both husbands and wives appear to share positive views about the quality of the health services in their communities. They are equally likely to trust that health providers are the best source of advice for a sick child (wives: 96%, husbands: 97%) (Table 6.7.1). However, there are discrepancies in perceptions of availability of treatment within individual states; in Kebbi, husbands are more likely to believe that treatments are available (wives: 74%, husbands: 89%), while in Sokoto the situation is reversed (wives: 82%, husbands: 61%). Males are considerably more likely to believe that health facilities have necessary treatments for sick children (males: 85%, females: 70%).

As with other services and behaviors, the overwhelming majority of males, approximately 72%, do not believe that anyone else influences their care seeking decisions (Table 6.7.2). This percentage is higher in Kebbi (85%) than in Sokoto (67%) and Zamfara (68%). Approximately one in seven husbands (15%) say that their spouse influences care seeking decisions, with a high of 19% in Zamfara and a low of 10% in Sokoto. Husbands are more likely to be influenced by health providers than wives (wives: 1.6%, husbands, 6.7%). Nearly all wives (92%) report that they are influenced by their husbands. Other influencers include mothers-in-law (wives: 9.4%, husbands: 4.1%) and mothers (wives: 7%, husbands: 7%). Very few husbands and wives report that their decision is influenced by religious or community leaders or by friends.

In multivariate analyses described above, we examined which factors most influence health behaviors related to child health. While the importance of individual factors varies across different health behaviors, it is evident that a combination of shared positive attitudes, increased knowledge, enhanced self-efficacy, and open discussions between partners tends to result in better health outcomes. More specifically, analyzing child health outcomes with a focus on breastfeeding, vaccinations, and treatment of fever, diarrhea, and pneumonia, we categorized influential factors for child health into six main themes: influencers, norms, attitudes, knowledge, self-efficacy, and discussions.

1. **Influencers:** Mothers tend to have a profound impact, but the involvement of fathers and community members also significantly influences health outcomes. For instance, mothers' involvement in vaccination discussions increases the likelihood of full immunization in children.

2. **Norms:** Community norms, especially regarding vaccinations, can greatly influence the decisions made by parents, showing the importance of societal perspectives in health behavior.

3. **Attitudes:** Shared positive attitudes between the parents tend to increase the likelihood of positive health behaviors. For example, in cases of diarrhea treatment, concordance in parental attitudes toward treatment options significantly boosts the chances of children receiving proper treatment.

4. **Knowledge:** Parents' joint understanding and knowledge about health issues directly influence health outcomes. When both parents share knowledge about vaccination timing, for example, the vaccination rates are highest.

5. **Self-efficacy:** Women's self-efficacy plays a crucial role in health behavior. For example, a woman's confidence in discussing breastfeeding with her partner doubles the chances of the child being exclusively breastfed for the first six months.

6. **Discussions:** Joint discussions and decision-making between parents generally lead to higher probabilities of positive health outcomes, as evident in the treatment of child fever and the decision to seek formal care for pneumonia symptoms.

Table 6.7.1. Perceptions of health services quality for sick children

Percentage of women aged 15 to 49 years with a child under 2 years reporting perceptions of health services quality for sick children, by male and female

| Method | Kebbi | | Sokoto | | Zamfara | | Total | | |
	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	Wife %	Husband %	p val
A healthcare provider is the best person to talk to when child is sick	96.5	92.8	93.0	96.5	97.7	98.4	96.4	96.8	.667
Facilities in my community often have treatment needed for sick child	73.5	88.7	81.6	60.6	89.4	91.7	84.3	85.0	.672
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 6.7.2. Who else influences decisions about seeking care for a sick child? Male versus female

Percentage of women aged 15 to 49 years with a child under 2 years reporting who else influences a woman's decision or seek care for a sick child, by male and female

Influence	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	P
	%	%	%	%	%	%	%	%	Val
No one else	4.2	84.6	7.1	67.4	7.0	68.2	6.4	71.7	**.000**
Spouse/partner	94.6	11.5	89.6	9.7	91.9	18.9	92.0	15.4	.000
Mother-in-law	20.6	3.4	9.3	6.9	5.2	3.4	9.4	4.1	.000
Mother	17.5	1.5	4.1	22.6	3.5	3.6	6.6	6.8	.901
Other own family	0.1	0.1	0.1	2.4	0.0	0.4	0.0	0.7	.000
Other partner's family	0.0	0.0	0.1	0.1	0.3	0.0	0.2	0.0	.001
Friends	2.6	0.7	0.8	0.5	1.2	2.2	1.4	1.5	.920
Health provider	0.5	2.0	0.2	0.3	2.5	10.5	1.6	6.7	.004
Community / Religious leader	0.0	0.1	0.5	0.1	0.2	0.1	0.2	0.1	.422
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Chapter 7. Gender

Household decision-making: Husbands and wives are largely concordant in agreeing that the husband is the principal decision-maker for things such as major household purchases, children's schooling, and working outside the home (Table 7.1). For example, 75% of wives and 81% of husbands agree that the husband is responsible for decisions about major household purchases. Couples also appear to be in agreement about who makes decisions about spending the husband's money; 80% of wives believe that the husband is the sole decision-maker for his money and 92% of husbands agree. Only 11% of wives and 8% of husbands believe that it is a joint decision. However, couples' perceptions about who is responsible for spending the wife's money appear to differ; 63% of wives believe they are the sole decider but only 43% of husbands agree.

Couples are also concordant in agreeing that joint decision-making is not the norm. Only one in five wives and one in six husbands say that they make joint decisions about major household purchases. These percentages are slightly lower for both when it comes to children's schooling (wives: 19%, husbands: 14%) and lower still for working outside the home (wives: 14%, husbands: 10%).

Across all three states and each health behavior, more husbands than wives reported that the couple makes decisions together, pointing out a potential difference in gender perceptions about what joint decision-making looks like (Table 7.2). More than half of husbands reported that the couple makes joint decisions about contraception (56%), giving birth in a facility (55%), exclusive breastfeeding (56%), and taking a sick child for treatment (55%). Fewer wives, albeit not substantially fewer, believe that decisions are made together for contraceptive use (50%), for giving birth in a health facility (44%), for exclusive breastfeeding (45%), and taking a sick child for treatment (49%).

Further adding to the discordance regarding who is ultimately responsible for specific decisions, we compared how husbands and wives differ in how they perceive the wife's role in decision-making. It is apparent that wives believe they have considerably more authority than their husbands think they do. For example, 36% of wives believe that they are the sole decision-maker about what they eat during pregnancy but only 14% of husbands agree. Approximately 28% of wives believe that they have sole authority over breastfeeding but only 9% of husbands believe that this is solely the wife's decision.

Gender roles: Couples also appear largely concordant in supporting traditional gender roles, even as they ostensibly support strong roles for women (Table 7.2.2). Nearly all husbands (98%) and wives (98%) agree that it is important for couples to discuss child health and make decisions together, even though only half of couples agree that they both decide together about taking a sick child for treatment. Couples are also concordant in agreeing that women should play a role in household decision-making, with agreement being highest in Zamfara (wives: 95%, husbands: 94%) and lowest in Sokoto (wives: 89%, husbands: 71%).

Couples agree about prioritizing boys' education over girls' education, with husbands being more likely to agree. Overall, 78% of husbands and 67% of wives agree that it is more important for boys to get an education than girls. Agreement with this norm is lower in Zamfara than in the other two states. Similarly, 79% of husbands and 70% of wives believe that a good marriage is more important for a girl than an education. Again, agreement with this norm is lower in Zamfara than elsewhere.

Nearly all husbands and wives believe it's a woman's job to care for the home and family.

Table 7.1. Women's role in household decision-making

Percentage of women aged 15 to 49 years with a child under 2 years reporting household decision-making roles by decision type

	Kebbi		Sokoto		Zamfara		Total		F(2.43, 398.70)
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	p
About how your money will be used?									
Respondent	69.0	95.6	66.6	94.5	59.8	89.1	63.2	91.6	56.441
Spouse	21.4	0.6	27.7	0.4	26.3	0.5	25.6	0.5	**0.000**
Both	9.6	3.6	4.7	5.2	13.5	10.4	10.8	7.8	
About how your partner's money will be used?									
Respondent	1.0	28.1	2.5	12.8	2.2	42.2	2.0	33.4	61.181
Spouse	81.4	60.7	89.6	66.5	76.0	28.5	80.1	43.1	**0.000**
Both	17.0	11.0	7.5	20.0	21.6	29.1	17.6	23.3	
About major household purchases?									
Respondent	0.8	87.7	3.3	73.1	5.6	81.2	4.1	81.1	238.343
Spouse	79.7	2.2	85.5	8.0	68.4	1.3	74.5	2.8	**0.000**
Both	19.0	10.1	10.8	18.6	25.9	17.3	21.2	15.9	
About schooling?									
Respondent	0.2	88.4	1.3	76.2	1.3	81.1	1.1	81.8	228.385
Spouse	74.1	1.3	86.0	1.7	69.7	1.7	74.2	1.6	**0.008**
Both	11.3	7.8	7.2	21.3	25.8	13.3	18.7	13.6	
About working outside the home?									
Respondent	0.9	90.5	1.4	80.8	4.6	86.5	3.1	86.3	275.102
Spouse	90.0	1.0	91.5	1.1	76.6	0.8	82.7	0.9	**0.000**
Both	8.7	8.2	5.5	17.9	18.6	7.2	13.7	9.5	
N	1079	1065	1035	841	1000	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 7.2. Women's role in household decision-making

Percentage of women aged 15 to 49 years with a child under 2 years reporting roles in decisionmaking for health behaviors

	Kebbi		Sokoto		Zamfara		Total		F(2.43, 398.70)
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	p
About using a contraceptive method?									
Mainly my decision	16.1	38.4	17.0	70.6	25.5	29.3	21.7	39.3	25.300
Mainly partner's decision	34.1	0.6	39.3	1.9	19.5	6.0	26.8	4.0	**0.000**
Both decide together	49.6	61.0	41.6	27.4	52.6	63.8	49.6	56.1	
Someone else	0.1	0.0	2.1	0.1	2.5	0.9	1.9	0.6	
About giving birth in a health facility?									
Mainly my decision	9.1	35.5	14.5	63.2	18.6	35.5	15.7	40.8	42.296
Mainly partner's decision	52.0	2.4	48.3	2.9	29.8	5.6	38.5	4.3	**0.000**
Both decide together	38.7	62.2	36.1	33.5	49.5	58.7	44.3	54.6	
Someone else	0.1	0.0	1.2	0.4	2.0	0.2	1.4	0.2	
About exclusive breastfeeding?									
Mainly my decision	18.2	31.9	32.2	61.9	29.8	25.5	27.8	34.0	8.553
Mainly partner's decision	37.1	17.8	28.6	6.1	18.9	6.7	24.9	9.1	**0.000**
Both decide together	44.0	50.2	36.3	31.9	48.3	66.4	44.8	56.1	
Someone else	0.7	0.1	2.9	0.1	3.0	1.4	2.5	0.9	
About the types of foods that the wife may eat during pregnancy?									
Mainly my decision	31.2	29.6	36.6	62.4	37.5	32.1	35.9	37.4	4.638
Mainly partner's decision	31.7	24.7	29.4	5.0	21.2	12.9	25.2	14.0	**0.008**
Both decide together	36.9	45.6	33.5	32.5	40.2	54.6	38.0	48.3	
Someone else	0.3	0.1	0.6	0.1	1.2	0.4	0.8	0.3	
About taking sick child for treatment?									
Mainly my decision	9.5	38.0	12.3	67.0	18.3	34.8	15.1	41.7	54.741
Mainly partner's decision	47.0	2.0	41.8	2.8	29.7	4.1	36.0	3.4	**0.000**
Both decide together	43.4	60.0	45.5	30.1	51.8	61.0	48.7	54.8	
Someone else	0.1	0.0	0.3	0.1	0.2	0.1	0.2	0.1	
N	1088	1065	1045	841	,011	958	3144	2864	

P val refers to significance test across the all three states combined of H₀: mean value for wives = mean for husbands

Figure 7.1. Prevalence of joint decisionmaking by topic area, wives and husbands
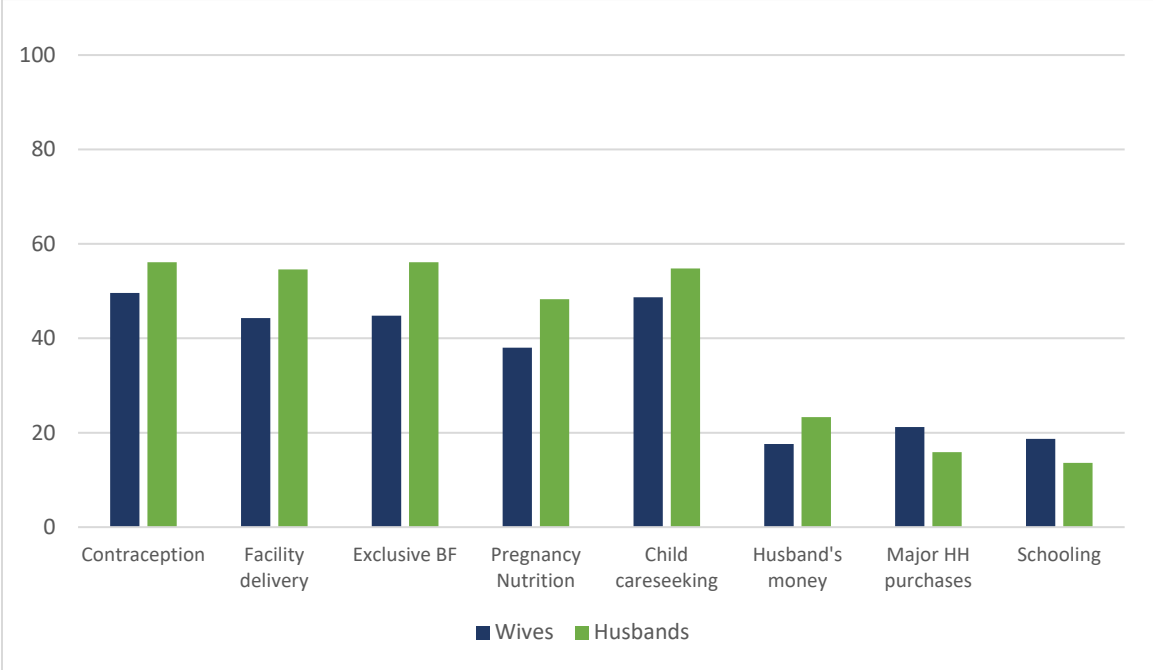
Table 7.3. Gender-related beliefs, attitudes, and perceptions

Percentage of women aged 15 to 49 years with a child under 2 years who agreed with certain gender-related beliefs, attitudes, or perceptions

	Kebbi		Sokoto		Zamfara		Total		F(2.43, 398.70)
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	p
It is important for couples to discuss child health and make decisions together	97.9	95.8	95.1	96.0	98.7	99.2	97.7	97.8	.969
A woman should play a role in household decision-making	87.7	81.4	78.7	71.3	94.6	94.2	89.7	86.9	.393
It's more important for boys to get an education than girls	69.8	86.0	79.8	86.7	61.4	71.8	67.2	77.9	**.020**
A good marriage is more important for a girl than an education	72.4	88.5	78.8	81.7	65.0	73.8	69.6	78.6	**.026**
It's a woman's job to care for the home & family	95.7	95.2	92.3	77.2	93.6	87.1	93.8	87.0	**.006**
N	1088	1065	1045	841	1,011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Chapter 8. Albishirin Ku! and Breakthrough ACTION/Nigeria SBC program exposure

Albishirin Ku! **and Breakthrough ACTION/Nigeria program exposure:** Across all three states. approximately two-thirds of husbands (69%) and wives (65%) reported exposure to any Breakthrough ACTION/Nigeria interventions. This includes exposure to any *Albishirin Ku!* radio component, including listening to the radio program or hearing the *Albishirin Ku!* song, hearing any malaria jingle on the radio, participating in a Breakthrough ACTION/Nigeria branded community dialogue, or receiving a visit from a CV with Breakthrough ACTION/Nigeria branding (Table 8.6.1). Overall, just more than half reported exposure to any *Albishirin Ku!* radio programming. There was considerable spillover of *Albishirin Ku!* media to Zamfara. Roughly six in ten adults reported exposure to any *Albishirin Ku!* radio component

In Sokoto, approximately 37% of husbands and wives reported having listened to the *Albishirin Ku!* program on the radio, while one in four husbands and wives listed to the program in Kebbi (Table 8.6.4). Listenership was lower in Zamfara (wives: 23%, husbands: 10%). Among listeners, more than two in five couples reported listening a few times a week (wives 43%, husbands 45%) while more wives (30%) than husbands (21%) reported listening a few times a week (Table 8.1.2). Perceptions of the program were very positive. More than 98% of husbands and wives reported that they enjoyed listening to the program and nearly all said that they learned something new from the program. The potential for the benefits of the program to extend beyond direct listeners was clear; approximately 8 out of 10 listeners reported that they had discussed it with family and friends.

Overall, roughly a third of wives (34%) and husbands (38%) reported exposure to the Albishirin Ku! song (Table 8.1.3). "Health" was the most common message noted by listeners. There was widespread exposure to Breakthrough ACTION/Nigeria malaria jingles, with exposure being highest in Zamfara. Approximately 8 of 10 husbands and seven of ten wives reported hearing any malaria jingle.

Overall, more husbands (12%) reported attending a community event/dialogue in the past 12 months compared to wives (6%) across all regions. However, disaggregated by states, more wives reported attending community events in Kebbi and Sokoto relative to their husbands, except in Zamfara (Table 8.1.1). There was no significant difference in attendance of CV community events with Breakthrough ACTION branding between husbands (2.6%) and wives (2.9%). CV visits (12%) and CV visits with Breakthrough ACTION branding (5%) were only reported by the wives (12%)

Table 8.1.1. *Albishirin Ku!* and Breakthrough ACTION/Nigeria exposure

Percentage of women 15 to 49 years with a child under 2 years and their husbands who have ever heard Albishirin Ku! on the radio

| | Kebbi | | Sokoto | | Zamfara | | Total | | |
| | Wife | Husband | Wife | Husband | Wife | Husband | Wife | Husband | |
	%	%	%	%	%	%	%	%	P
Self-reported exposure to any BA or AK intervention	49.8	40.5	57.5	54.5	73.5	85.4	65.0	69.3	**.322**
Exposure to any Albishirin Ku! radio component	32.0	37.3	54.3	51.5	57.5	60.7	51.4	53.7	.634
Listened to Albishirin Ku! program on the radio	24.4	24.5	37.6	37.2	22.8	9.9	26.3	18.4	**.003**
Heard radio program with couple Faruk and Jamila	20.7	8.6	26.3	26.0	14.4	12.1	18.3	14.0	.011
Heard Wannan Sakone Daga Ma'aikatar Lafiya Kasa, Da Ta Jiha, Da Kuma	25.1	13.4	28.7	37.0	45.7	51.4	37.7	40.1	.700
Heard Albishirin Ku! song on the radio	26.9	33.5	50.8	49.0	36.6	29.7	37.6	34.3	.020
Any malaria jingle	28.2	24.4	43.8	40.1	70.1	82.1	55.6	61.0	.244
Attended a community event/dialogue in the past 12months	13.3	5.5	12.0	10.6	1.2	14.4	6.1	11.6	**.008**
Attended CV community events with Breakthrough ACTION branding in past 12 months	10.3	2.2	3.2	8.2	0.1	0.9	2.9	2.6	.773
Did CV visit household in past 12 months?	28.4	0.0	10.0-	0.0	6.4	0.0	11.8	0.0	.000
Did CV with Breakthrough	19.6	0.0	3.3	0.0	0.2	0.0	5.0	0.0	.000

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	P
ACTION branding visit in the past 12 months									
Heard slogan Albishirin Ku! with Airtel 3-2-1 on a mobile phone in the past 12 months?	1.0	1.3	1.0	2.1	0.6	1.3	0.8	1.5	.114
N	1,088	1,065	1,045	841	1,011	958	3,144	2,864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 8.1.2. *Albishirin Ku!* radio programming perceptions

Percentage of women 15 to 49 years with a child under 2 years and their husbands who have ever heard Albishirin Ku! on the radio by health messages heard

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	P
Have listened to *Albi Shirin Ku!* on the radio?	24.4	24.5	37.6	37.2	22.8	9.9	26.3	18.4	**.018**
Frequency of hearing *Albishirin Ku!* radio program									
Never	0.4	0.8	0.7	0.0	0.0	0.0	0.3	0.2	.086
Every day	9.9	5.9	4.2	9.5	5.7	17.0	6.1	10.8	
A few times a week	48.4	32.5	34.4	65.9	47.1	30.8	43.4	44.9	
Once a week	24.7	27.6	19.5	12.1	37.8	24.6	29.6	20.6	
Less than once a week	14.4	30.3	37.6	10.7	8.7	17.3	18.7	18.6	
Don't Know	2.2	3.0	3.5	1.8	0.7	10.4	1.9	4.8	
Messages from radio program									
FP for spacing births	60.9	40.4	52.7	27.4	15.6	20.3	35.9	29.0	.259
FP for limiting births	37.8	31.7	17.1	10.8	6.0	13.5	15.7	17.9	.570
Facility birth	33.2	23.7	13.5	13.6	7.9	15.7	14.6	17.3	.459
Birth plans	46.4	44.7	21.7	20.8	26.8	22.7	29.1	28.5	.912
Antenatal care	74.2	55.0	68.2	61.0	54.2	16.6	62.4	45.3	.003
Diarrhea	22.1	26.0	5.8	4.4	22.8	10.7	17.4	12.8	.225
Malaria	43.8	54.2	45.2	71.1	78.4	57.6	61.4	61.8	.937
Cough with rapid breaths	27.9	27.6	4.9	2.5	4.1	1.8	9.0	9.8	.805
Child nutrition	40.0	35.2	13.4	9.8	6.7	7.8	15.3	16.8	.703
Immunizations	56.2	38.6	34.9	56.3	21.7	17.0	32.6	38.7	.285
Breastfeeding	32.9	27.1	11.7	15.8	8.3	4.8	14.2	15.7	.677
Maternal nutrition	34.1	26.7	6.0	12.2	4.2	6.3	10.7	14.7	.216
Newborn care	31.3	16.1	4.5	7.5	0.8	2.1	8.0	8.4	.865
Postpartum care	27.5	21.1	4.1	6.1	2.5	1.6	7.9	9.2	.630
WASH	19.2	9.1	4.2	3.2	4.0	6.6	7.1	6.0	.657
Perceptions									
I enjoyed listening to this program	99.8	98.4	95.6	96.8	99.6	100.0	98.4	98.3	.352
I learned something new from this program	95.6	94.1	84.6	91.8	99.8	100.0	94.3	95.0	.257
I discussed this program with family and friends	85.9	85.5	64.6	71.9	89.3	78.5	81.0	78.0	**.006**
N	280	270	408	318	246	101	934	689	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 8.1.3. *Albishirin Ku!* song on the radio and key health message

Percentage of women 15 to 49 years with a child under 2 years and their husbands who have ever heard the *Albishirin Ku!* song

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	P
Heard Albishirin Ku! Song on the radio	26.9	33.5	50.8	49.0	36.6	29.7	37.6	34.3	.431
Key messages of song:									
Health	69.9	68.1	21.3	52.4	48.2	63.2	43.6	61.3	**.006**
Albishirin Ku!	30.7	48.7	43.5	53.5	34.5	37.6	36.5	44.4	.281
Pregnant women going to ANC	51.0	11.9	30.5	20.4	13.4	7.6	24.1	12.1	**.000**
Child birth spacing / FP	53.7	8.3	35.8	18.6	8.0	8.3	23.0	11.1	**.001**
Nutrition for children	42.4	13.0	13.2	13.0	15.7	4.3	19.0	8.6	**.001**
Prompt care for malaria	28.6	7.5	7.3	10.9	18.0	5.2	16.5	7.3	**.002**
Maternal nutrition during pregnancy	42.3	8.7	12.1	6.5	9.1	2.0	15.0	4.7	**.000**
N	303	356	534	426	383	288	1,222	1,070	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 8.1.4. *Malaria* jingles heard on the radio

Percentage of women 15 to 49 years with a child under 2 years and their husbands who heard Albishirin Ku! radio jingles

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	P
Auto mechanic and driver discussing malaria	18.9	15.1	22.9	16.5	49.2	39.3	37.1	29.4	**.017**
"My Car' jingle	18.0	21.0	30.3	30.4	57.0	67.9	43.0	50.1	.057
Football coach and captain talking about malaria	15.9	16.4	19.8	20.0	50.1	42.2	36.3	32.1	.080
"The Champion" jingle	16.0	20.1	28.0	29.7	60.7	71.1	44.2	51.6	.053
Food seller discussing with customer who was sick but is now well	17.2	15.2	21.0	12.0	48.3	38.6	35.8	28.2	**.006**
"Adherence to Drugs" jingle	19.5	19.3	30.5	26.8	59.0	65.4	44.5	47.6	.128
Food seller discussing with customer who was complaining of a fever	17.6	15.5	20.3	12.7	49.0	34.2	36.2	25.8	**.000**
"Test before treatment" jingle	19.4	18.0	27.7	25.0	59.2	59.3	43.9	43.4	.210
Food seller discussing with husband about child with fever not taken for care	17.8	14.5	19.9	13.0	45.4	34.3	34.0	25.7	**.002**
"Prompt care-seeking" jingle	19.2	17.3	28.0	24.6	56.0	57.0	42.2	41.8	.191
Any malaria jingle	28.2	24.4	43.8	40.1	70.1	82.1	55.6	61.0	.244
N	1088	1065	1045	841	1011	958	3144	2864	

P val refers to significance test across the all three states combined of H_o: mean value for wives = mean for husbands

Table 8.1.5. Media Partnership Programming shows heard on the radio

Percentage of women 15 to 49 years with a child under 2 years and their husbands who listened to Media Partnership programming

	Kebbi		Sokoto		Zamfara		Total		
	Wife	Husband	Wife	Husband	Wife	Husband	Wife	Husband	
	%	%	%	%	%	%	%	%	P
Taka Naka Rawan	14.6	14.3	13.7	13.3	16.7	14.4	15.6	14.2	**.003**
Don Tuwon Gobe	16.0	13.5	15.3	15.9	17.5	14.5	16.7	14.5	.108
Kai da lafiya	18.3	13.4	20.3	22.2	26.0	22.4	36.3	32.1	.204
Lafiyar mata da kananan yara	22.3	13.4	25.3	28.8	39.8	32.6	23.2	20.3	.159
Lafiyar Uwar Komai	21.8	13.9	23.4	21.3	31.6	24.4	33.0	27.6	**.013**
N	1088	1065	1045	841	1011	958	3144	2864	
Messages from radio shows	18.7	10.5	25.1	12.0	33.5	24.4	28.6	18.9	**.001**
Family planning for spacing	62.5	57.3	37.7	27.0	27.8	23.0	34.5	27.8	.367
Family planning for limiting	47.3	48.6	17.3	19.2	19.5	5.7	22.9	12.7	**.033**
Facility birth	38.7	51.7	16.0	17.3	14.7	9.8	18.3	15.9	.625
Birth plans	56.0	56.5	17.6	30.5	24.1	11.6	27.3	19.5	.125
ANC	71.2	60.7	70.8	67.8	64.4	19.0	66.6	30.2	**.000**
Diarrhea	30.5	42.9	13.8	8.2	24.6	17.5	23.4	19.5	.423
Malaria	51.2	73.3	58.1	74.5	77.1	67.4	69.9	69.0	.891
Cough with rapid breaths	36.8	48.2	9.4	0.7	4.2	2.3	9.7	7.9	.565
Child nutrition	43.1	41.0	15.6	16.1	9.6	4.7	15.4	10.6	.232
Immunizations	63.7	44.8	47.4	63.8	35.5	36.9	41.6	41.2	.945
Breastfeeding	36.6	36.9	12.6	23.1	21.2	13.3	21.7	17.4	.361
Maternal nutrition	37.8	35.4	9.5	15.8	9.9	2.9	13.7	8.5	.125
Newborn care	31.3	34.4	10.3	11.9	5.7	0.8	10.1	6.4	.218
Postpartum care	34.6	37.6	10.0	3.8	5.3	1.2	10.3	6.1	.163
WASH	31.6	36.1	16.8	2.1	25.5	6.0	24.7	9.2	**.014**
N	214	121	263	109	361	241			

P val refers to significance test across the all three states combined of H$_o$: mean value for wives = mean for husbands

Chapter 9 Multivariate Analyses

9.1   Who engages in discussions of FP?

We also conducted multivariate analyses to examine which couples would be more likely to engage in discussions of FP and in turn to see how discussions of FP might be associated with actual contraceptive use. Regressions were stratified by husbands and wives in order to determine if different factors were important for discussions for one relative to the other. A key hypothesis to be tested was whether exposure to Breakthrough ACTION/Nigeria activites increased the likelihood of discussions because, as noted previously, promoting communication within couples is a primary goal of Breakthrough ACTION/Nigeria SBC efforts.

Exposure to certain Breakthrough ACTION/Nigeria activities was postively associated with the likelihood of discussions but the effects differed between husbands and wives (Figure 9.2.1). Among wives, exposure to any Albishirin Ku radio was associated with a 5 pp difference in the likelihood of discussions, from 24% to 29%. Other Breakthrough ACTION/Nigeria activites had no effect on the likelihood of discussons for wives. Among husbands, attending a community event was associated with a 9 pp increase in the likelihood of discussions but Albishirin Ku! radio had no effect.i

Discussions were also more common among couples who approved of FP. For example, among couples in which both partners approved of FP, there was a 44% likelihood among wives and a 55% likelihood among husbands that they had discussed contraception (Figure 9.2.2). In cases in which only the husband approved of FP, husbands were much more likely to report a discussion than wives (wives: 16%, husbands:49%). When only the wife approved of contraception, almost no husbands (4%) reported that a discussion had occurred, although 31% of wives did.

Among wives, most ideational factors, including injunctive and descriptive norms, knowledge, and beliefs, were not associated with the likelihood of discussions, although self-efficacy was (Figure 9.2.3); wives who felt confident that they could convince their husbands to use modern contraception were 13 pp more likely, 29% versus 16%, to have discussed contraception with their husbands, although such self-confidence might actually have come through prior discussions with positive outcomes.

The picture was slightly different among husbands, as husbands who believed that FP use was common among couples in their community (p=.02), who felt that couples who use FP have better life quality (p=.09), and who did not believe that use of FP did not cause women to become promiscuous (p=.06) were all more likely to engage in discussions with their wives (Figure 9.2.4).

Figure 9.1.1. Likelihood of engaging in a discussion about FP by exposure to Breakthrough ACTION/Nigeria activities
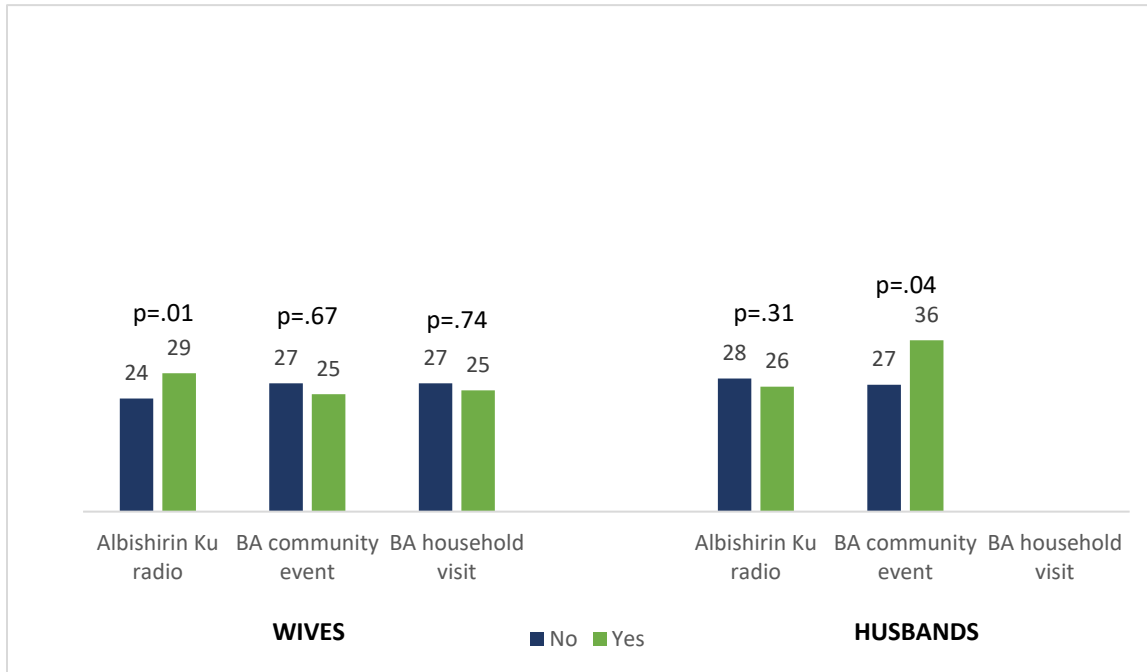
Figure 9.1.2. Likelihood of engaging in a discussion about FP by level of approval within a couple
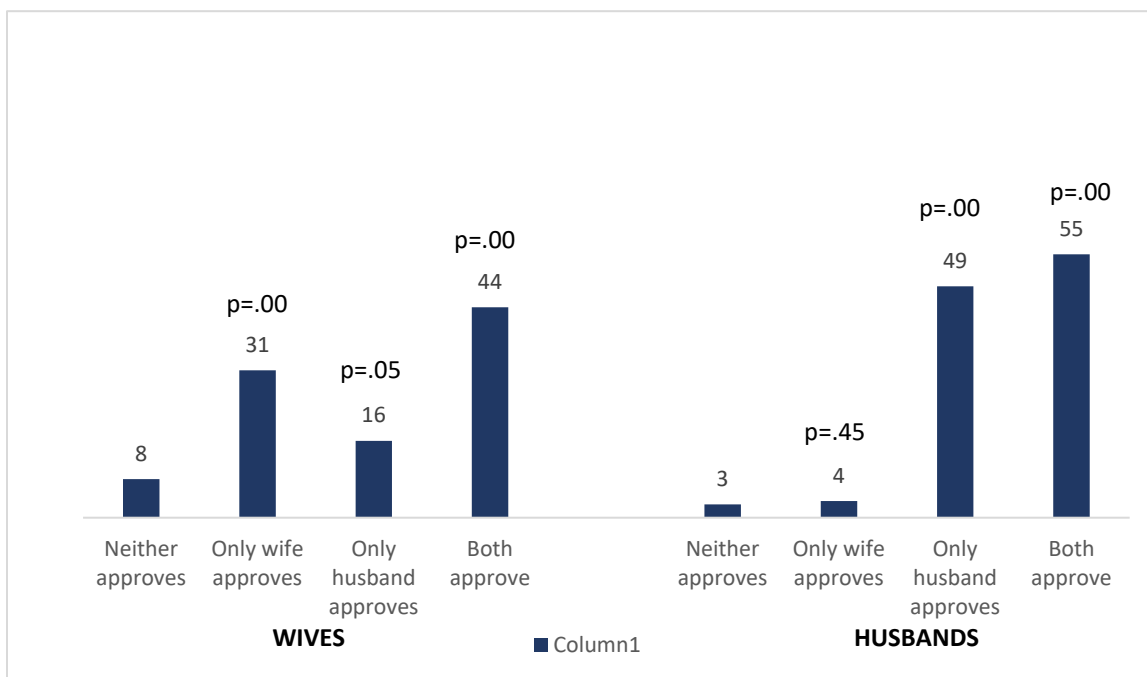
Figure 9.1.3. Likelihood of engaging in a discussion about FP by ideational factors, wives
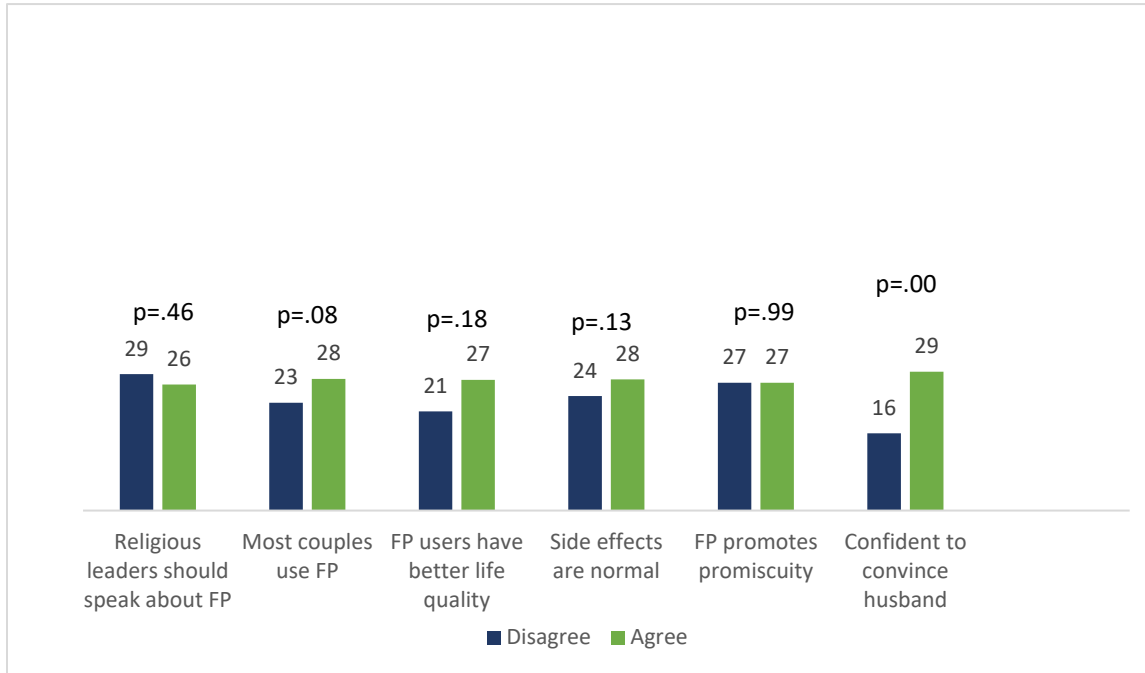
Figure 9.1.4. Likelihood of engaging in a discussion about FP by ideational factors, husbands
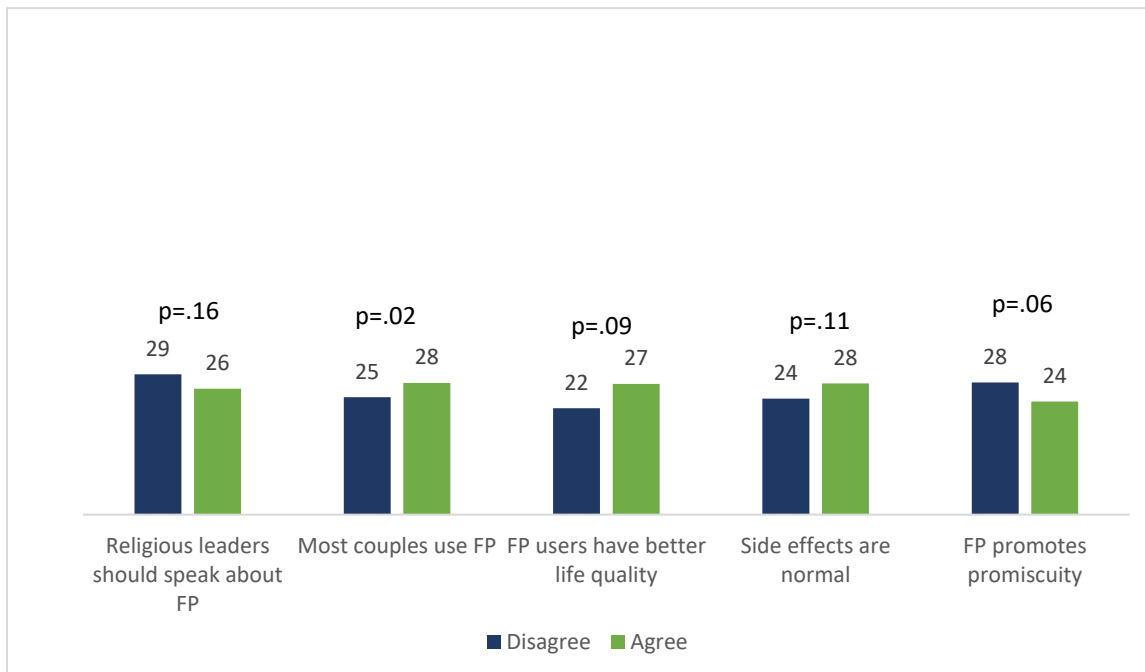
Chapter 10. Key Findings, Conclusion and Recommendations

Over the period from 2019 to 2023, baseline, midline, and endline waves of the BSS have been used to assess the changes in indicators targeted by the integrated social and behavior change (SBC) activities of the USAID-funded Breakthrough ACTION/Nigeria's project. As part of this evaluation, the BSS not only measures changes in behavioral outcomes across FP, malaria, and MNCH+N, but also measures whether certain behavioral drivers, or ideations, have been modified by SBC activities over the life of the Breakthrough ACTION/Nigeria project. Indeed, the BSS is unique in its focus on measuring these psychosocial influences—or emotional, social, and cognitive domains—that have been posited by various theories as intermediate determinants of behavioral outcomes. For some health areas, the BSS is pioneering in its collection of new metrics for behavioral drivers (e.g., pneumonia, breastfeeding, ANC, delivery care) while in other areas, the BSS has adapted published metrics for the Nigerian context (e.g., vaccination, diarrhea).

This report has used extensive data from married couples with a child under the age of two to compare wives and husbands in terms of their health knowledge, attitudes, beliefs, perceived norms, and behaviors related to malaria, FP and MNCH+N. We then looked explicitly at how concordance and discordance on these factors within couples are related with the priority behaviors targeted by Breakthrough ACTION/Nigeria. As noted, a separate report[5] with these same data examines the question of the relative effectiveness of integrated versus vertical SBC and looks specifically at trends from baseline to endline in behavioral outcomes and their hypothesized ideational antecedents.

This section presents conclusions and recommendations across priority health behavior areas, exposure to Breakthrough ACTION's media product- *Albishirin-Ku* and gender bias in couples communication of health topics. Some recommendations are cross cutting.

Malaria

The study examined the knowledge, attitudes, and behaviors related to malaria prevention and treatment among couples. Both husbands and wives were found to possess basic knowledge about malaria transmission and prevention methods, such as the use of mosquito nets. However, misconceptions still existed, with some respondents identifying incorrect transmission mechanisms and having reservations about diagnostic tests. Despite the knowledge, there was a lack of trust in diagnostic tests, leading to the continued request for malaria treatment even with negative test results.

Overall, intentions to engage in appropriate preventive and treatment measures were high among both husbands and wives. However, the study revealed that specific beliefs or misconceptions had nuanced effects on the use of Long-Lasting Insecticide-treated Nets (LLINs) among pregnant women and children. Shared anxiety over malaria did not significantly enhance LLIN usage, while incorrect beliefs about malaria prevention led to a decrease in LLIN usage. Wives' beliefs had a greater influence on LLIN usage than husbands', emphasizing the importance of targeted health education for women.

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[5] Breakthrough Research. (2023) Behavioral Sentinel Surveillance Survey in Nigeria: Endline Technical Report, Washington, DC: Population Council

The analysis also showed that joint decision-making between parents was associated with positive health outcomes, particularly regarding seeking prompt care and using ACT for a child with fever. The attitudes of individual partners, especially the husband, significantly influenced certain behaviors. The husband's belief in health facilities' capabilities influenced the decision to seek care, while the wife's confidence in convincing her husband positively influenced all outcomes. Family dynamics and the wife's self-efficacy and gender equality attitudes played important roles in healthcare decision-making.

These findings highlight the complexity of knowledge, attitudes, and misconceptions surrounding malaria and the need for comprehensive and correct health education. They also underscore the importance of involving both partners in decision-making processes and recognizing the influence of wives in healthcare decisions. The study's results can inform future interventions, emphasizing the role of husbands, the value of joint decision-making, and the impact of wives' self-efficacy and gender equality attitudes in promoting effective malaria prevention and treatment.

Recommendations

Recommendations for Breakthrough ACTION/Nigeria:

1. Promote trust in diagnostic tests: strengthen social behavior change campaigns to emphasize the reliability and effectiveness of diagnostic tests for malaria. Provide clear information on the importance of relying on test results for appropriate treatment decisions, even in the presence of negative results.

2. Enhance knowledge of malaria prevention: Intensify efforts to educate both husbands and wives on the correct use and benefits of LLINs for pregnant women and children. Emphasize the role of LLINs as an effective preventive measure and debunk misconceptions that may discourage their usage.

3. Engage both partners in decision-making: Encourage joint decision-making between husbands and wives regarding malaria prevention and treatment for their children. Promote open communication and shared responsibility to ensure that both partners actively participate in healthcare decisions.

4. Strengthen community engagement: Engage community leaders, local influencers, and social networks to promote positive health behaviors and challenge misconceptions about malaria. Encourage the adoption of health-seeking behaviors and the importance of joint decision-making within the community.

Recommendations for USAID Nigeria

1. Strengthen health facilities and services: Advocate to state governments to invest in improving the capabilities and quality of healthcare facilities, ensuring they are well-equipped to provide prompt and accurate malaria diagnosis and treatment. This can enhance the husband's trust in seeking care and contribute to positive health outcomes.

2. Wives' beliefs and empowerment: Organize/integrate interventions that specifically target wives to empower women thereby promoting self-efficacy and emphasizing gender equality in healthcare decision-making.

Family planning

The research findings highlight several important insights regarding knowledge, attitudes, and behaviors related to modern contraception among couples. While awareness of modern contraceptive methods is high, actual usage and discussions about contraception remain low. The main reasons for non-use include the belief that such decisions are "Up to God" and opposition by the husband. Intentions to begin using contraception in the next six months are also relatively low, particularly among husbands.

The study reveals paradoxical findings in terms of beliefs and attitudes toward contraception. While approval of contraception for birth spacing is low, the majority of couples believe that using contraception leads to a better quality of life and that it is important to discuss contraception. However, there are still prevalent myths about contraception, such as the belief that it can cause cancer or deformities in babies. On the positive side, a significant proportion of respondents recognize that contraceptive side effects are normal and usually temporary.

Discussions about contraception between couples are rare, and decision-making is typically reported as a joint effort. The husband has a strong influence on the decision to use contraception, while the wife's influences also include her mother-in-law. Normative influences and perceptions of community usage significantly impact the uptake of modern contraception. Approval of FP and the belief in its quality-of-life benefits play a role in increasing contraceptive use. Joint decision-making within couples positively influences approval of FP.

The analysis further demonstrates that concurrence between spouses on behavior-promoting factors increases the likelihood of contraceptive use, while discordance decreases usage. Discussing FP between spouses also significantly increases the probability of the wife using contraception. Attitudes and beliefs have a greater impact on contraceptive use than pure knowledge, highlighting the importance of fostering positive attitudes and dispelling misconceptions.

Recommendations

Recommendations for Breakthrough ACTION/Nigeria:

1. Develop targeted SBC interventions: Implement SBC interventions that specifically target communication at the couple level. These interventions should aim to improve knowledge, attitudes, and behaviors related to modern contraception among couples. Tailor the interventions to address the identified barriers and misconceptions surrounding contraception, with a focus on dispelling myths and promoting accurate information.

2. Foster concordance and positive attitudes toward contraception: Promote shared positive attitudes toward contraception within couples. Emphasize the benefits of contraception for birth spacing and the improvement of quality of life. Highlight the positive aspects of contraception while addressing concerns and misconceptions to increase acceptance and usage.

3. Empower women in contraceptive decision-making: Recognize the influential role of husbands in contraceptive decision-making, but also empower women to confidently discuss and decide on contraceptive use. Provide women with the necessary information, skills, and support to engage in open and effective discussions with their partners about FP. Encourage women to assert their preferences and involve them in decision-making processes.

4. Engage influential family members, particularly husbands: Involve influential family members, such as husbands and mothers-in-law, in FP discussions and interventions. Conduct targeted awareness campaigns and education sessions to address opposition by husbands and seek their support for contraceptive use. Highlight the benefits of contraception for the well-being of the entire family.

5. Dispel myths and provide accurate information: Develop educational programs that specifically target the prevalent myths and misconceptions surrounding contraception. Provide accurate information about contraceptive methods, addressing concerns related to side effects, safety, and impact on fertility. Utilize various communication channels, including community workshops, mass media, and healthcare providers, to disseminate correct information.

6. Promote joint decision-making and communication: Encourage couples to engage in discussions about FP and contraceptive use. Highlight the importance of joint decision-making, where both partners have an equal voice in determining the number and timing of children. Facilitate open and supportive communication between partners, creating a safe space for discussing contraception and addressing concerns.

7. Strengthen normative influences and community support: Leverage the influence of normative factors and community support in promoting contraceptive use. Develop campaigns that showcase positive examples of couples using contraception and experiencing improved quality of life. Engage community leaders and religious influencers to endorse FP and dispel misconceptions within their communities.

Antenatal, Delivery, and Newborn Care

The evaluation findings indicate that attitudes, beliefs, and behaviors related to pregnancy and childbirth are influenced by perceptions that formal care is only necessary under certain circumstances. While self-efficacy to seek care is high among both husbands and wives, only a quarter of women delivered at a healthcare facility. However, the majority expressed an intention to use ANC services and have a facility delivery for the next pregnancy. Lack of perceived need was the main reason for not seeking ANC or delivering at a health facility, followed by fatalism, spousal opposition, and cost.

Knowledge and awareness of pregnancy risks and the benefits of pregnancy-related care are fairly high, although some indicators, such as the recommended number of ANC visits and the timing of the first visit, showed room for improvement. Shared beliefs and attitudes within couples positively influenced ANC attendance, highlighting the importance of communication and shared decision-making. Women who were confident in discussing ANC with their husbands were more likely to engage in the recommended ANC visits. Community members, including partners, mothers, friends, and community/religious leaders, also had an influence on ANC attendance.

The findings emphasize the importance of fostering shared beliefs, improving communication within couples, enhancing self-efficacy, and leveraging social influences to increase ANC attendance. Strategic social and behavior change (SBC) interventions are recommended to address these factors and promote the utilization of ANC services. These interventions should focus on improving couples' understanding of the importance of ANC, dispelling misconceptions, empowering women to initiate discussions about ANC, and engaging influential community members in promoting ANC attendance. Education level and wealth showed a trend toward influencing ANC attendance, although the effects were not statistically significant.

Recommendations

Recommendations for Breakthrough ACTION/Nigeria:

1. Promote shared beliefs and attitudes: Develop interventions that aim to foster shared beliefs within couples regarding the importance of ANC and facility delivery. Emphasize the benefits of formal care and debunk misconceptions about the necessity of seeking care only under certain circumstances.

2. Enhance communication within couples: Implement social and behavior change interventions that focus on improving communication between husbands and wives about ANC and facility delivery. Empower women to initiate discussions with their husbands and involve influential family members, such as mothers and friends, to encourage ANC attendance.

3. Strengthen self-efficacy: Develop messages that enhance women's confidence in their ability to discuss ANC with their husbands and make decisions about seeking care. Provide information and support to women to build their self-efficacy in navigating the healthcare system and accessing ANC services.

4. Engage influential community members: Collaborate with community and religious leaders to promote the importance of ANC and facility delivery. Utilize their influence to endorse and advocate for ANC attendance within the community. Provide education and awareness campaigns targeting community members to address misconceptions and highlight the benefits of formal care.

5. Improve knowledge and awareness: Develop educational materials and campaigns that address gaps in knowledge, such as the recommended number of ANC visits and the timing of the first visit. Disseminate information about pregnancy risks, danger signs, and the role of ANC in protecting maternal and newborn health.

Recommendations for USAID Nigeria:

1. Consider socio-economic factors: While education level and wealth did not show significant effects on ANC attendance, advocate to government to continue to monitor and address potential disparities in access to care and ensure that ANC services are affordable and accessible to all socio-economic groups.

Child Health

Both husbands and wives generally hold positive views about the quality of health services in their communities. They believe that health providers are the best source of advice for a sick child. However, there are discrepancies in perceptions of treatment availability across different states. In Kebbi, husbands are more likely to believe treatments are available, while in Sokoto, wives are more likely to hold this belief. Husbands are also more likely to believe that health facilities have necessary treatments for sick children compared to wives.

Regarding care-seeking decisions, the majority of husbands (72%) believe that no one else influences their decisions. In contrast, wives reported that they are influenced by their husbands in nearly all cases. Husbands are more likely to be influenced by health providers, while wives are influenced by their husbands, mothers-in-law, and mothers to a lesser extent. Religious or community leaders and friends have minimal influence on care-seeking decisions for both husbands and wives.

These findings highlight the importance of considering the influential roles of husbands and other family members in health-seeking decisions. It is crucial to engage husbands and address their perceptions and beliefs to promote effective utilization of health services. Additionally, involving and educating other family members, such as mothers-in-law and mothers, can further support positive health-seeking behaviors.

Breastfeeding:

The findings indicate that while most children in the states are breastfed, sub-optimal breastfeeding practices are prevalent due to the early introduction of liquids other than breastmilk. Both husbands and wives recognize the benefits of breastfeeding and the nutritional value of breastmilk. However, a significant proportion of husbands and wives do not consider exclusive breastfeeding for the first six months as important, leading to misconceptions and sub-optimal practices. Additionally, husbands' perceived influence over breastfeeding decisions is higher than what wives perceive.

The self-efficacy, autonomy, and attitudes of women significantly impact exclusive breastfeeding practices. Communication and joint discussions about breastfeeding between couples double the likelihood of exclusive breastfeeding. Community norms and personal beliefs, particularly those held by wives, also play important roles. Professional advice from health providers holds more weight than family opinions in promoting exclusive breastfeeding.

To promote optimal breastfeeding practices, strategic behavior change communications (SBC) should focus on boosting women's self-efficacy, encouraging shared communication and decision-making between couples, and leveraging the influence of healthcare providers. These efforts should address misconceptions, enhance women's confidence in exclusive breastfeeding, and promote a supportive environment for breastfeeding.

Vaccinations:

Child vaccination rates in the surveyed states are alarmingly low, with a majority of children aged 12 to 23 months not receiving any vaccines. However, respondents generally hold positive perceptions of vaccination services, social norms favoring immunization, and have high self-efficacy in utilizing vaccination services. Despite this, negative attitudes and beliefs, such as concerns about vaccine safety, exist among a significant portion of husbands and wives.

Husbands play a crucial role in vaccination decision-making, with their opposition being a prominent reason for non-vaccination reported by wives. Maternal engagement and knowledge, as well as shared parental knowledge, positively influence vaccination rates. Community norms and husband's approval also contribute to higher vaccination likelihood. Interestingly, higher education levels of husbands show an inverse relationship with vaccination rates.

To improve child vaccination rates, strategic behavior change communication programs should prioritize promoting immunization discussions involving wives, enhancing maternal knowledge and engagement, fostering shared knowledge among couples, leveraging community norms, and considering demographic factors. Involving healthcare providers more actively in influencing immunization decisions is also recommended. These efforts can help address negative attitudes, strengthen decision-making within couples, and increase vaccination rates among children.

Acute respiratory infections:

There are significant gaps in awareness of pneumonia symptoms, particularly among husbands. Cough was recognized as a symptom by more wives than husbands, but knowledge of rapid or difficult breathing as a sign of pediatric pneumonia was limited. A considerable proportion of respondents were unable to identify effective medicines or antibiotics for treating pneumonia, although awareness of antibiotics was highest in Kebbi.

While most respondents were aware of the severity of pneumonia and expressed intentions to seek appropriate care, misconceptions persisted, such as the belief that only weak children are at risk of dying from pneumonia. Data indicates that less than half of children with pneumonia symptoms received formal sector care, with a significant proportion seeking care from informal medical sources.

Factors influencing the decision to seek formal healthcare for children with pneumonia symptoms include joint decision-making by both husband and wife, the wife's knowledge of acute respiratory infection (ARI) symptoms, and her confidence in convincing her husband to seek care. Joint discussions between the couple also positively impact healthcare-seeking behavior. Education levels of both spouses, particularly the husband's education, play a role in seeking formal care.

To address these findings, social behavior change (SBC) interventions should focus on promoting joint decision-making, increasing ARI symptom knowledge among wives, and improving education among husbands. Understanding the influence of cultural norms, particularly the role of mothers-in-law, can also inform interventions aimed at encouraging formal healthcare utilization for child illnesses.

Diarrhea:

Awareness of the severity of diarrhea in children, prevention behaviors, and effective treatments is generally high. Husbands and wives differ in their specific knowledge of prevention methods, with wives emphasizing cleanliness and husbands mentioning vaccinations more frequently. Both spouses are aware of oral rehydration salts (ORS) as a treatment for diarrhea, but wives demonstrate better knowledge of zinc as an effective treatment. The majority of spouses can identify the benefits of ORS and zinc, although specific knowledge about their mechanisms is limited.

While both spouses are aware of the potential consequences of diarrhea, only three-quarters know how to prepare ORS. The decision to give a child ORS and zinc is influenced by the wife's knowledge and beliefs about diarrhea treatment, her confidence in convincing her husband to seek care, and the concordance in attitudes between the parents. Norms within the community and communication within the couple have less impact on the likelihood of treatment. Family dynamics, such as mother's age, education levels, and wealth quintile, show mixed effects.

Improving women's health literacy, promoting agreement between parents' attitudes, and enhancing self-efficacy are important for influencing child health outcomes. These findings provide guidance for future Social Behavior Change (SBC) programs aimed at improving diarrhea treatment practices.

Recommendations

Quality of health services:
   1. Address the discrepancies in perceptions of treatment availability by improving access to healthcare services in states with lower perceived availability.

2. Enhance the training and capacity of health providers to ensure consistent and high-quality healthcare services across communities.

Breastfeeding:
1. Promote the importance of exclusive breastfeeding in the first six months through targeted education campaigns aimed at both husbands and wives.
2. Provide counseling and support for new mothers and families to encourage and enable optimal breastfeeding practices, including the avoidance of non-breastmilk liquids.

Vaccinations:
1. Address concerns about vaccine safety through evidence-based information campaigns to improve attitudes and beliefs about vaccinations.
2. Engage husbands in educational initiatives to increase their knowledge about the benefits and safety of vaccinations, as they play a significant role in vaccination decisions.
3. Strengthen vaccination services and ensure their availability and accessibility to improve vaccination rates.

Acute Respiratory Infections:
1. Increase awareness of pneumonia symptoms and effective treatments, particularly among husbands, through targeted educational programs and community outreach initiatives.
2. Empower wives with knowledge about pneumonia symptoms and encourage joint decision-making between husbands and wives regarding seeking formal care and treatment.
3. Focus on improving the education level of husbands to promote better healthcare-seeking behavior for acute respiratory infections.

Diarrhea:
1. Conduct educational campaigns to ensure both husbands and wives have comprehensive knowledge of prevention measures and treatments for diarrhea.
2. Empower wives to take an active role in decision-making regarding recommended treatments, and provide them with the necessary knowledge and resources to influence their husbands positively.
3. Promote concordance in parental attitudes toward diarrhea prevention and treatment and support the wife's confidence in convincing her husband.

Albishirin Ku! and Breakthrough ACTION/Nigeria program exposure

The study found that self-reported exposure to the *Albishirin Ku!* campaign media varied among wives, ranging from 39% in Zamfara to 54% in Sokoto. For husbands, the range was lower, from 31% in Zamfara to 50% in Sokoto. On average, wives had a higher exposure rate (43%) compared to husbands (36%), although this difference was not statistically significant. In Sokoto, approximately 37% of both husbands and wives reported listening to the *Albishirin Ku!* program on the radio, while in Kebbi, one in four husbands and wives listened to the program. Listening rates were lower in Zamfara, with 23% of wives and 10% of husbands reporting listenership. The program received positive feedback, as more than 98% of husbands and wives reported enjoying it and learning something new. Additionally, approximately 8 of 10 out of ten listeners shared the program with their family and friends, suggesting potential benefits beyond direct listeners.

Recommendations

1. Enhance exposure among husbands: As the study indicates that husbands generally had lower exposure rates compared to wives, efforts should be made to increase their engagement with the *Albishirin Ku!* campaign. This can be achieved by developing targeted strategies, such as promoting the program through channels that are more likely to reach and resonate with husbands, including community gatherings, workplaces, and social media platforms that are popular among men.

2. Strengthen program content: Since the program received positive feedback, it is crucial to maintain its quality and relevance to sustain listener interest and engagement. Regularly assess the program's content through audience feedback and research to ensure it remains informative, engaging, and culturally sensitive. This could involve incorporating diverse perspectives, addressing specific health and social issues, and featuring local success stories and role models to increase its appeal.

3. Leverage the power of social influence: The finding that a significant proportion of listeners shared the program with their family and friends highlights the potential for the campaign's benefits to extend beyond direct listeners. Capitalize on this social influence by designing awareness campaigns that encourage listeners to actively promote the program within their social circles. This could involve providing incentives or rewards for sharing, facilitating discussions or debates around program topics, or creating community-based listening groups.

4. Conduct targeted impact assessments: To gain a deeper understanding of the program's effectiveness, conduct rigorous impact assessments to measure changes in knowledge, attitudes, and behaviors among both direct listeners and their social networks. This will help evaluate the program's reach and identify specific areas where it has had a positive impact, enabling further refinement and optimization.

5. Establish long-term sustainability: Ensure the long-term sustainability of the *Albishirin Ku!* campaign by securing funding, establishing partnerships with local organizations and government agencies, and integrating it into existing health and social programs. Building a strong network of stakeholders and supporters will help secure resources, maintain program continuity, and enable scalability to reach more communities.

Women's self-efficacy and gender dynamics

The study reveals that a wife's self-efficacy and confidence play a crucial role in influencing various health-related behaviors, including malaria prevention, FP, ANC, exclusive breastfeeding, child immunization, seeking formal care for child illnesses, and administering appropriate diarrhea treatment. The wife's confidence in convincing her husband positively impacts outcomes such as seeking care for a child with fever and pneumonia, FP and contraceptive use, ANC visits, and child immunization. Additionally, the wife's self-efficacy, autonomy, and attitudes significantly affect exclusive breastfeeding and the administration of diarrhea treatment. These findings highlight the importance of SBC interventions that empower women, boost their confidence, and enhance their role in health-related decision-making processes.

Recommendations

1. Empower women through education and information: Develop targeted educational programs to enhance women's knowledge about health issues, including malaria prevention, FP, ANC, breastfeeding, immunization, and diarrhea treatment. Provide them with accurate and evidence-based information to build their confidence and enable them to make informed decisions.

2. Promote gender equality and shared decision-making: Advocate for gender equality within households and communities to foster an environment where women are encouraged and supported to actively participate in health-related decision-making processes. Promote open communication and collaboration between husbands and wives, ensuring that decisions are made jointly and based on mutual understanding and respect.

3. Enhance communication and negotiation skills: Provide training and support to women to improve their communication and negotiation skills, enabling them to effectively discuss health issues with their husbands and other family members. This includes building assertiveness and self-confidence to express their opinions and concerns.

4. Strengthen healthcare provider training: Educate healthcare providers about the importance of involving both husbands and wives in discussions related to health issues. Promote sensitivity to gender dynamics and encourage healthcare providers to engage with women, addressing their specific needs and concerns during consultations.

5. Community engagement and support: Engage community leaders, local influencers, and religious leaders to support and promote women's empowerment in health-related decision-making. Conduct community awareness campaigns to challenge gender norms and promote the value of women's participation in health decisions.

6. Supportive policy environment: Advocate for policies that recognize and support the role of women in health-related decision-making processes. This includes policies that promote women's access to education, healthcare services, and economic opportunities, as well as policies that protect women's rights and address gender inequalities.

Couples' communication and decision-making

Couples recognize the importance of discussing health issues, particularly regarding child health and pregnancy. Discussions on child health topics are common, with husbands often initiating and participating more than wives. Wives' beliefs and initiation of discussions have a significant influence on health practices, indicating a need for targeted health education for women. Joint discussions and agreements between spouses lead to positive health outcomes, such as increased contraceptive use, ANC visits, and children's vaccination rates. The wife's confidence in discussing health issues with her husband plays a crucial role in promoting positive behaviors.

Joint decision-making is prevalent in various health behaviors, although wives often perceive slightly lower levels of joint decision-making than husbands. Husbands' influence is significant in most health decisions, while wives' influence is less pronounced. Joint decision-making improves outcomes in malaria treatment, FP, ANC visits, and childhood immunization. These findings emphasize the importance of involving both partners in healthcare decisions and highlight the need for future SBC programs to promote joint discussions and empower women in health-related conversations.

Recommendations

1. Develop couple-centered health promotion programs: Design and implement comprehensive health promotion programs that target couples as a unit. These programs should emphasize the significance of open communication, joint decision-making, and shared responsibilities in addressing health issues. Provide couples with practical skills and tools to facilitate effective communication and decision-making processes related to child health, pregnancy, contraception, and other relevant health topics.

2. Empower women through gender-sensitive interventions: Develop gender-sensitive interventions that specifically empower women in health-related decision-making. Provide women with knowledge, skills, and resources to confidently initiate discussions about health issues with their partners. Offer training sessions or workshops to enhance their communication skills, assertiveness, and negotiation abilities, enabling them to actively participate in healthcare decisions.

3. Address discordance and disagreement: Implement interventions that address discordance and disagreement between couples regarding health behaviors. Facilitate dialogue and mediation sessions to encourage couples to understand each other's perspectives and reach mutually agreeable decisions. Provide information and resources to address misconceptions or concerns that may contribute to discordance, helping couples find common ground and adopt positive health behaviors.

4. Strengthen health education for men: Recognize the influence husbands have on health behaviors and ensure their active involvement in health education initiatives. Develop targeted interventions that focus on improving men's understanding of the importance of joint decision-making, dispelling myths or misconceptions, and fostering supportive attitudes toward women's roles in healthcare.

Couples' concordance and key behaviors

The evaluation findings indicate that shared beliefs and attitudes within a couple have varying effects on health behaviors across different health areas. Shared beliefs and attitudes often increase the likelihood of positive health outcomes, but there is variability depending on the specific health behavior. Wives' beliefs, knowledge, attitudes, and norms generally have a more significant influence on positive health outcomes compared to husbands. Wives' confidence, approval, and involvement in discussions significantly impact health behaviors such as prompt treatment for fever, contraception use, ANC attendance, exclusive breastfeeding, immunization, and seeking care for pneumonia symptoms. In contrast, husbands' roles are more varied across health areas, with their beliefs, approval, and education level influencing specific health behaviors.

These findings suggest the importance of tailoring SBC programs to address shared beliefs and attitudes, particularly focusing on empowering women, addressing misconceptions, and improving their health literacy, self-efficacy, and confidence in decision-making and discussions. While wives' influence is prominent, husbands' beliefs, education level, and involvement in discussions should also be considered. The findings highlight the need for multi-level, nuanced, and gender-sensitive SBC interventions to effectively promote health behaviors and improve health outcomes.

Recommendations

1. Empower women: SBC programs should prioritize empowering women by providing them with information, knowledge, and skills to make informed decisions about health behaviors. This can be achieved through targeted health education and interventions that enhance women's health literacy, self-efficacy, and confidence in discussing and initiating health-related discussions.
2. Address misconceptions: It is crucial to address misconceptions, particularly among women, to ensure accurate knowledge and beliefs about health behaviors. SBC programs should focus on dispelling myths

and providing correct information through various channels, including community outreach, counseling sessions, and educational materials.

3. Tailor interventions: Recognize the variability in the influence of shared beliefs and attitudes across different health behaviors and areas. SBC programs should be tailored accordingly, taking into account the specific needs, preferences, and cultural contexts of the target population. This includes developing interventions that are sensitive to gender dynamics and the roles of both husbands and wives in decision-making.

4. Involve husbands: While wives' influence is prominent, husbands' beliefs, education level, and involvement in discussions play a role in shaping health behaviors. SBC programs should actively engage husbands and promote their participation in health-related discussions and decision-making processes. This can be achieved through couple-oriented interventions, where both partners are encouraged to contribute to health-related conversations.

5. Multi-level approach: Adopt a multi-level approach to SBC interventions, considering individual, interpersonal, and community factors that influence health behaviors. This may involve community engagement, social support networks, and the promotion of positive social norms that encourage open communication and shared decision-making within couples.

Health services

Perceptions about the health system, including the availability, quality of services, and trust in healthcare providers, are significant factors that influence health behaviors. The findings indicate high levels of trust in health providers and the quality of care they deliver. Trust also extends to the effectiveness of available prevention methods and treatments for various health conditions, such as antibiotics for child pneumonia, antimalarials for pregnant women, and LLINs. Interestingly, few wives mention poor quality as a reason for not utilizing health services, while husbands may occasionally raise concerns about quality but it is not typically the primary reason. Cost is rarely reported as a barrier to accessing healthcare

Recommendations

1. Address husbands' concerns about quality: Although husbands may occasionally raise concerns about the quality of services, it is essential to address their specific worries. Conduct targeted awareness campaigns and engage husbands in discussions to address any misconceptions and provide reassurance about the quality of care available.

2. Focus on other barriers beyond quality: Since poor quality and cost are rarely cited as primary barriers to accessing healthcare, it is important to identify and address other factors that may hinder health-seeking behaviors. This could include improving the accessibility and convenience of healthcare services, addressing cultural or social barriers, and ensuring the availability of necessary supplies and medications.

3. Collaborate with community leaders and influencers: Engage community leaders, influencers, and local organizations to promote positive perceptions of the health system and reinforce trust in healthcare providers. Leverage their influence to disseminate accurate information, address concerns, and encourage health-seeking behaviors.

Perceptions of need

Despite having high trust in health services, many couples opt not to utilize them, particularly for pregnancy-related services, as they do not perceive these services as necessary or useful unless they encounter adverse circumstances or complications. A significant number of couples, who did not attend any ANC visits during the last pregnancy, cited a lack of perceived need as the primary reason. This perception extends to FP, with fatalism being a major reason for not using contraceptive methods. Surprisingly, both wives and husbands recognize the benefits of contraception for women and children, yet less than half of wives and only a third of husbands approve of its use. This disapproval may stem from desires for more children or the belief that fertility is determined by a higher power.

Recommendations for Breakthrough ACTION/Nigeria

1. Education and awareness campaigns: Develop targeted educational campaigns to raise awareness about the importance of pregnancy-related services and FP, highlighting their benefits for maternal and child health. Focus on addressing misconceptions and emphasizing the value of preventive care in ensuring healthy pregnancies and spacing births appropriately.

2. Promote the significance of regular ANC visits: Emphasize the importance of regular ANC visits, even in the absence of complications, to monitor maternal and fetal health, detect potential issues early on, and receive appropriate guidance and support throughout pregnancy.

3. Culturally sensitive approach: Collaborate with community leaders, religious organizations, and influential figures to promote open discussions and provide accurate information within the context of cultural values and beliefs.

4. Address fatalistic attitudes: Address fatalistic beliefs by promoting a sense of personal agency and empowerment. Provide counseling and support that focuses on the benefits of planning and the potential for better health outcomes for both women and children through FP practices.

5. Strengthen male involvement: Recognize the important role of husbands in reproductive health decision-making. Engage men through targeted interventions that promote their understanding of the benefits of FP, involve them in counseling sessions, and encourage shared responsibility for reproductive health choices.

Recommendations for further SBC research

1. Measuring the effectiveness of Breakthrough ACTION/Nigeria interventions: We spent a good bit of time trying to estimate the effectiveness of Breakthrough ACTION/Nigeria SBC interventions using multivariate regression analysis and to a lesser extent matching methods. In many of the presented multivariate regression models, there is a variable for a couple's self-reported exposure to any Breakthrough ACTION/Nigeria interventions (any of AK radio program and messages, malaria jingles, non-branded messaging, community dialogues, CV household visits). This is broken down into who was exposed to messaging: no one, wife only, husband only, both. This was intended to test the hypothesis that the effects of exposure depended upon who was exposed and that exposure by both partners would be most likely to lead to behavior change. In models with behavioral outcomes, this variable was almost never a statistically significant factor, but it was in models looking at ideational factors such as approval of FP. Different

measures of exposure, disaggregating by type and even by dose-response, were also tried. These too were almost never statistically significant, leading to three hypotheses:

- o The effects of Breakthrough ACTION/Nigeria work indirectly through the ideational factors and once those are controlled for in the models, there is no "leftover" effect of Breakthrough ACTION/Nigeria.
- o Breakthrough ACTION/Nigeria has no effect on behaviors.
- o Exposure to Breakthrough ACTION/Nigeria interventions is "endogenous," confounded by other (cultural? social? Health system?) factors that we cannot control for because we currently do not have good measures of them. Trying to estimate treatment effects in this situation requires other analytical methods (e.g., matching, instrumental variables) that become very specific to the individual behavior and the data themselves. One method might meet the conditions for use for one behavior (e.g., FP) but not another.

Adequate consideration and analysis for estimating program effects requires more time than was available given other priorities but could be an important avenue for research for an independent evaluator.

2. Dose response analysis: Only a few of the Breakthrough ACTION/Nigeria interventions lend themselves to dose response analysis based on the collected data, for example the frequency with which a person heard *Albishirin Ku!* programming (never, every day, a few times a week, once a week, less than once a week) or the number of malaria jingles that a person was exposed to or the number of media partnership programming shows that a person reported hearing. We find the former to be particularly promising, although that too has issues with potential confounding / endogeneity as described above. We do not advocate for an analysis of dose-response effects based on index such as the number of different types of interventions a person was exposed to since this then leads to natural questions about which intervention is most effective or if some interventions matter more than others or if certain combinations are more important, which would be a more logical starting place anyway.

3. Deeper dive into distinguishing the role of couples' shared health beliefs and decision-making as they relate to malaria prevention versus malaria control. This could help explain how these interpersonal dynamics influence the uptake of critical malaria prevention and treatment strategies, such as fever treatment, the use of LLINs, and adherence to IPTp. How do these factors—discussions, gender dynamics, women's empowerment, differential attitudes, and knowledge—come into play when the issue is addressing an immediate health concern (e.g., a child's fever) versus behaviors that are performed more regularly and on a daily basis. Do decisions involving the immediate health of a child require more discussion and consensus between parents? Are decisions about daily preventive measures less dependent on consensus and therefore more influenced by individual attitudes and knowledge, particularly of the wife? Whose trust in health providers matters more for prompt treatment seeking and malaria testing? Is incorrect knowledge more disadvantageous for prevention or for cure?

4. Couples communication, women's empowerment, health decision-making amid intricate spousal dynamics and cultural norms: This study would consolidate many of the findings in this report to examine the interaction between wife's empowerment, self-efficacy, and concordance/discordance in attitudes, norms, knowledge, and beliefs within the couple across different health topics. It will highlight distinct patterns in decision-making across health areas, including the relative importance of husbands', wives', and concordant beliefs on priority behaviors, as well as the roles of other influencers (e.g., mothers, mothers-in-law, religious leaders, healthcare providers) in positively or negatively shaping behaviors. Findings will examine the relative importance of fostering shared beliefs versus improving communication within couples versus enhancing self-efficacy, which can then be used to adapt SBC strategies.

Limitations

The report identifies numerous instances in which couples express positive attitudes toward FP and health services. However, it is important to note that these attitudes may not necessarily be indicative of their actual behaviors, potentially due to the presence of social desirability bias, where respondents may overstate their attitudes to conform to societal expectations or to please the interviewer.

For instance, while most couples believe that using contraception can improve their quality of life, less than half approve of contraception for spacing and only a small proportion indicate an intention to begin using contraception in the near future. Similarly, although couples believe that discussing contraception is important, they rarely engage in such discussions.

This pattern is not unique to FP. For example, although a large percentage of husbands and wives consider health facilities the best option for delivering a baby, only a few births occur there. This may be due to non-users of health services who report that they did not feel the services were necessary. Therefore, positive attitudes reported by couples may need to be contextualized with actual evidence of their actions or inactions to inform effective interventions and policies.

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