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Behavioral sentinel surveillance survey in Nigeria: Endline technical report

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ENDLINE TECHNICAL REPORT

Behavioral Sentinel Surveillance Survey in Nigeria

JUNE 2023

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Behavioral Sentinel Surveillance Survey in Nigeria: Endline technical report

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Acronyms

ACT	Artemisinin-based combination therapy
ANC	Antenatal care
ARI	Acute respiratory infections
BCG	Bacille Calmette-Guérin
BSS	Behavioral Sentinel Surveillance
CHW	Community Health Worker
CI	Confidence intervals
CRERD	Center for Research, Evaluation Resources, and Development
CV	Community volunteer
DID	Difference-in-differences
DTP3	Diphtheria-tetanus-pertussis
IPTp	Intermittent preventive treatment for malaria during pregnancy
ITN	Insecticide treated net
JHU CCP	Johns Hopkins University Center for Communication Programs
LGA	Local government area
LLIN	Long-lasting insecticidal net
MMR	Maternal mortality ratio
MNCH+N	Maternal, newborn, and child health plus nutrition
NDHS	Nigeria Demographic and Health Survey
NHREC	National Health Research Ethics Committee
NMEP	National Malaria Elimination Program
NMIS	Nigeria Malaria Indicator Survey
NPC	National Population Commission
ORS	Oral rehydration solutions
PHC	Primary health care
PMI	President's Malaria Initiative
PP	Percentage point
PPMV	Patent and proprietary medicine vendor
RDT	Rapid diagnostic test
SBC	Social and behavior change
SBCC	Social and behavior change communication
SMC	Seasonal malaria chemoprevention
U5MR	Under-5 mortality rate
USAID	United States Agency for International Development

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Executive Summary

This technical report presents results from 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 are intended to assess changes in indicators targeted by the integrated social and behavior change (SBC) activities of the USAID-funded Breakthrough ACTION/Nigeria project. The Breakthrough ACTION/Nigeria project, which began in 2019 and is slated to run until 2025, focuses on the health areas of malaria; family planning; 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 and group meetings, and SBC messaging campaigns through mass media and digital media.

The primary objective of this study is to compare the effectiveness of integrated SBC programming, as implemented by Breakthrough ACTION/Nigeria in Kebbi and Sokoto states, with single-focused vertical SBC programming, used by Breakthrough ACTION/Nigeria to target malaria outcomes in Zamfara state.

About the BSS

The endline BSS follows prior survey waves conducted in 2019, at the inception of Breakthrough ACTION/Nigeria, and again in 2021, at the project's originally intended midpoint. This report presents baseline-to-endline comparisons of female respondents' behaviors, attitudes, knowledge, self-efficacy, and beliefs related to malaria, family planning and MNCH+N, as well as their knowledge, perceived social norms, and intentions. The survey employed a multi-stage sampling design to gather information from women of reproductive age on health behaviors and the factors that shape them. Using interviewer-directed, face-to-face interviews, the survey collected data on psychosocial influences across cognitive, emotional, and social domains. These influences have been identified by a range of behavioral theories as intermediate determinants of health decision-making and behavioral outcomes. As these theories suggest, an individual's beliefs, attitudes, perceptions of social norms, and sense of self-efficacy can all play roles 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 years, each with a child under 2 years old, were randomly selected from wards within Breakthrough ACTION/Nigeria program areas. Data were also collected from the women's husbands, but analysis of couples' knowledge, attitudes, and norms, as well as couples' dynamics and decision-making are the subject of a companion report and are not addressed in detail here.

To examine the causal impact of integrated SBC relative to vertical SBC, we examined trends in key behavioral indicators in the integrated states of Kebbi and Sokoto relative to those in Zamfara using both unadjusted and adjusted difference-in-differences (DID) models. DID models, frequently used in evaluation research, compare the difference in an outcome in one group before and after receiving treatment (i.e., baseline to endline) with the difference in that same outcome over the same period in a control group. In this case, Kebbi and Sokoto states, the treatment states, received integrated programming, while Zamfara, the comparison state, received vertical malaria-only SBC. The difference between these two differences (i.e., the difference-in-differences) is the treatment effect, reflecting whether integrated or vertical SBC has a greater effect on an outcome. Positive (and statistically significant) estimates suggest that the integrated states had greater improvement in outcomes than Zamfara, while negative estimates indicate the opposite.

We improved the validity of the causal interpretation of integrated versus vertical SBC using adjusted DID models that control for potential confounding factors that could also be contributing to changes over time (or lack thereof). Multivariate DID models controlled for differences in women's characteristics (e.g., age, level of education, parity), husband's characteristics (e.g., level of education), and household characteristics (e.g., asset-based wealth).

The most important tests of integrated versus vertical SBC are in the area of malaria where both approaches

seek to change the same indicators, albeit with their different approaches. On other indicators (e.g., family planning, pregnancy-related care excluding intermittent preventive treatment for malaria during pregnancy [IPTp], breastfeeding, child vaccinations and treatment of acute respiratory infection [ARI] and diarrhea), comparisons between the integrated and vertical states primarily test the effectiveness of integrated SBC versus no SBC, since Zamfara would have no SBC programming targeting these indicators.

Because this was a large-scale evaluation covering wide geographic areas, there were inevitably real-world factors that could have differentially affected each state—the timing of mass distribution of long-lasting insecticide treated nets (LLINs), varying levels of insecurity, challenges with the distribution of drugs and other commodities—as well as potential spillover of ***Albishirin Ku!*** radio programming from Sokoto to Zamfara, that would have potentially affected non-malaria outcomes in the latter state. Nevertheless, the paucity of at-scale tests of these two common approaches to SBC programming provided more than sufficient justification for this research endeavor.

Key Findings

Impact

In aggregate, our results suggest that integrated SBC interventions may be more effective in promoting positive health outcomes across various domains, including malaria prevention, family planning, pregnancy-related care, and treatment of childhood illnesses, compared to vertical programming approaches.

For malaria, Breakthrough ACTION/Nigeria uses intensive programming focused solely in this health area in Zamfara to target malaria outcomes, but in the integrated states the program incorporates malaria messaging within branded programming. The key behaviors targeted by Breakthrough ACTION/Nigeria for malaria are LLIN use and care by vulnerable groups (pregnant women and children under age two), IPTp, malaria testing for children with fever, prompt treatment of positive malaria cases with artemisinin-based combination therapy (ACT), and children's receipt and completion of seasonal malaria chemoprophylaxis provided by community health workers.

During the study period, differential timing of mass LLIN distribution across the three states introduced the potential for diminishing the effects of malaria prevention SBC efforts by Breakthrough ACTION/Nigeria in the integrated SBC states relative to the vertical SBC state. In Zamfara, where a mass LLIN distribution occurred in 2020, the percentage of households owning at least one net increased by 12 pp, from 74% at baseline to 88% at endline. Net use, however, increased by a considerably larger amount. In households with at least one LLIN, the percentage of pregnant women sleeping under an LLIN nearly doubled from 39% at baseline to 77% at endline, while the percentage of children under the age of 2 sleeping under an LLIN increased by 35 pp from 54% to 89%. These sizable increases in LLIN use suggest that the gains are likely due to a combination of improved access to LLINs and an increase in motivation among households in Zamfara, potentially (but not conclusively) driven by effective interventions by Breakthrough ACTION/Nigeria.

Absent mass distribution campaign since 2018 in Kebbia and since 2017 in Sokoto, the percentage of households with at least one LLIN decreased considerably in Kebbi (from 78% at baseline to 46% at endline) and in Sokoto (from 80% at baseline to 61% at endline. In spite of this, lower LLIN ownership did not translate into sharp declines among the priority groups. Among households with at least one LLIN, use by pregnant women increased in both Kebbi (29% at baseline, 51% at endline) and Sokoto (31% at baseline, 41% at endline). Similarly, among households with at least one LLIN, use by children under age 2 improved from 38% to 68% in Kebbi and from 47% to 66% in Sokoto.

The integrated programming of Breakthrough ACTION/Nigeria seeks to improve the uptake of modern contraception by targeting norms, attitudes, and beliefs related to birth spacing and contraceptive use. The primary family planning indicator, current use of modern contraception, indeed improved more in the integrated state of Kebbi relative to Zamfara, but this result was not statistically significant in either unadjusted or adjusted regression models (Adjusted DID=9.8 percentage points (pp), p=.392; unadjusted DID=2.8 pp, p=.547). Contraceptive use indicators in Sokoto showed slight declines, leading to negative DID estimates relative to Zamfara, but these too were not statistically significant.

[a]The decline in Kebbi was partially mitigated by a mass distribution campaign of LLINs that began toward the end of the data collection period, with one in five households in Kebbi receiving a net at that time.

While pregnancy-related outcomes improved in both Kebbi and Sokoto, improvements were larger in Zamfara, where Breakthrough ACTION/Nigeria worked to improve uptake of IPTp. For example, the percentage of women in Kebbi who made four or more ANC visits increased by 8 pp, from 24% at baseline to 32% at endline. However, this same indicator increased by a larger 12 pp in Zamfara, from 26% to 38%. A similar pattern was observed for facility deliveries as well. The percentage of births occurring in a health facility increased by 7 pp in Kebbi (15% at baseline, 23% at endline) but by a larger amount, 11 pp, in Zamfara (16% at baseline, 27% at endline). This pattern may reflect differences in the characteristics of the respondents in the two states, with those in Zamfara having greater economic resources and higher education levels. After controlling for these differences in regression analysis, we observed more pronounced improvements in Kebbi relative to Zamfara, as indicated by adjusted DID estimates of 3.5 pp for ANC4+, 4.0 pp. for facility deliveries, and 10.4 pp for IPTp, although these results are not statistically significant.

The integrated states generally performed better than the vertical state in terms of ensuring appropriate treatment for common child illnesses. For example, treatment of diarrhea with oral rehydration solutions (ORS)/zinc improved by 12 pp in Kebbi (from 18% to 30%) and by 11 pp in Sokoto (from 12% to 23%), as compared with a decline of 4 pp (from 27% to 23%) in Zamfara. In adjusted DID models, this yielded statistically significant treatment effects of 24 pp for Kebbi relative to Zamfara and of 16 pp for Sokoto relative to Zamfara. Similarly, treatment with antibiotics for children with ARI symptoms increased by 22 pp (from 41% to 63%) in Kebbi and by 12 pp (from 26% to 38%) in Sokoto, while this indicator declined by 24 pp (from 53% to 28%) in Zamfara during the same period. Hence, adjusted treatment effects were 45 pp for Kebbi and 35 pp for Sokoto and were statistically significant. While these large effects could possibly be attributable to the integrated SBC targeting treatment of child illness in Kebbi and Sokoto, it could also be attributable, at least in part, to frequent stockouts of antibiotics in Zamfara.

Breastfeeding indicators worsened in all three states, with none of the adjusted DID estimates being statistically different from one state to the next. Full childhood immunization rates increased in both Kebbi and Zamfara, but the magnitudes of the changes were small, 4 pp in Zamfara and 3 pp in Kebbi, and both unadjusted and adjusted DID treatment effects were not statistically different from zero.

Malaria

IPTp during pregnancy: The percentage of women who reported receiving the recommended three or more (3+) doses of SP/Fansidar—intermittent preventive treatment for malaria during pregnancy (IPTp) - increased by nearly 10 pp from baseline to endline in Kebbi (23% at baseline, 34% at endline) but changed minimally in the other two states—Sokoto (15% at baseline, 15% at endline) and Zamfara (19% at baseline, 21% at endline). This yielded an adjusted DID estimate of 10 pp in Kebbi relative to Zamfara, but this result was not statistically significant. As in the baseline, the majority of women received their first dose in their second trimester. The three most common reasons cited for not taking IPTp were that it was not necessary because the pregnant woman was not sick, that the woman did not attend ANC, or that pregnancy outcomes are "Up to God." In Kebbi, there was an increase in awareness from baseline to endline of all risks to the baby if the mother contracts malaria during pregnancy, including premature birth (26% at baseline, 44% at endline), low birth weight (13% at baseline, 27% at endline), and miscarriage (35% at baseline, 57% at endline). In Sokoto, awareness of risks declined, while the results for Zamfara were mixed.

Pediatric fever prevalence and treatment: Across all three states, a minority of children with fever were given a malaria blood test, although there was a sizable increase in testing in Sokoto (17% at baseline, 25% at endline) that was not matched in the other two states. In Kebbi, testing rates fell (23% at baseline, 15% at endline), while they increased in Zamfara (from 24% at baseline to 30% at endline). None of the estimated adjusted DIDs were statistically significant, however. The most common reason for not testing was that respondents felt the test was unnecessary (Kebbi: 52%, Sokoto: 36%, Zamfara: 23%) or that the test was not offered (Kebbi: 28%, Sokoto: 25%, Zamfara: 33%).

Sokoto showed increases in several treatment-related behaviors, including increases in obtaining medicines for fever (74% at baseline, 91% at endline), treatment with ACT (18% at baseline, 27% at endline), seeking care (54% at baseline, 79% at endline). These latter results yielded DID estimates relative to Zamfara of 14.8 pp ($p<.01$), 7.6 pp (NS), and 22.8 pp ($p<.01$) respectively. However, prompt treatment within the first 24-48 hours showed no improvement in Sokoto, decreasing slightly from 65% to 61%. Across all treatment seeking indicators, Zamfara showed no improvement, while Kebbi showed a worsening in several indicators, except for prompt treatment

of fever within 24-48 hours, which increased from 62% to 81%, yielding an adjusted DID estimate of 22 pp (NS). There was also an improvement in completion of the full course of ACT in Kebbi, from 62% to 94%, as compared with an improvement from 79% to 95% in Zamfara, and a decline in Sokoto from 82% to 73%.

Seasonal malaria chemoprevention (SMC): At endline, most women were aware of medicine given to children during the rainy season to prevent malaria (Kebbi: 88%, Sokoto: 86%, Zamfara: 79), and most households reported that a CHW had visited their household during the rainy season to distribute chemoprophylaxis to children (Kebbi: 86%, Sokoto: 71%, Zamfara: 64%). For both indicators, prevalence was higher in the integrated states than in the intense malaria-only state. Among households that were visited in all three states, most children (Kebbi: 86%, Sokoto: 71%, Zamfara: 76%) took the medicine provided by the CHW. For those that did not, the most common reasons given were that the child was unavailable during the visit, that the child was not sick, or that they forgot.

Malaria ideations: Even though Zamfara state received more intensive malaria-related SBC, the adjusted DID estimates indicate that malaria ideational factors such as attitudes, norms, and beliefs improved more in Kebbi relative to Zamfara, suggesting that malaria SBC efforts may have been more effective there, although almost none of the adjusted DID estimates were statistically different from zero. For example, in Kebbi, there was a more significant reduction in the perception that a child's fever is nearly always malaria, with an adjusted DID of 4.3 percentage points. Similarly, beliefs surrounding malaria prevention, like the necessity of children under five and pregnant women sleeping inside nets, increased more in Kebbi (with adjusted DID estimates of 4.9 and 3.6 percentage points respectively). Sokoto, too, improved more than Zamfara in several of the attitudinal and behavior indicators related to malaria, while Zamfara showed greater improvement in other areas. However, the magnitudes of the improvements in ideational indicators in Sokoto relative to Zamfara were generally larger for those indicators where it did better, suggesting overall more effective malaria SBC interventions in Sokoto. Again, however, the adjusted DID estimates were generally not statistically significant.

Family planning

Contraceptive use: Modern contraceptive use increased in both Kebbi (from 9% to 16%) and Zamfara (from 16% to 19%) but these increases were more sizable in Kebbi, possibly a result of Breakthrough ACTION/Nigeria efforts. In contrast, modern contraceptive use declined slightly in Sokoto (from 11% to 9%). The improvements in Kebbi and Zamfara were primarily driven largely by a rise in the use of injectables (Zamfara: from 8.3% to 9.4%, Kebbi: from 5.8% to 6.4%) and implants (Zamfara: from 3.9% to 5.6%, Kebbi: from 2.1% to 5.3%). Additionally, oral contraception usage increased by 2.0 percentage points in Kebbi (from 1.2% to 3.2%). The changes in postpartum modern contraceptive use mirrored those of the full sample of women with a child under two years.

Contraceptive beliefs, attitudes and myths: The situation regarding contraceptive beliefs, attitudes, and myths is complex, with a range of indicators showing improvements in both the integrated states of Kebbi and Sokoto, as well as in Zamfara. In Sokoto, there was an increase in women's approval of contraception for birth spacing from 36% to 44%, while the same indicator remained largely unchanged in Kebbi (48% at baseline and 46% at endline). The percentage of women who believed that it was important for couples to discuss family planning increased slightly in Sokoto, from 63% to 70%, but increased by a larger margin in the malaria-only state of Zamfara, moving from 73% to 82%. There was no change observed in Kebbi. Across all three states, women at endline were more likely to agree that couples using family planning have a better quality of life, with the increases in Zamfara being higher than those in the other two states. There was little change, however, in the percentage of women who agreed that using contraception would lead to negative social repercussions, such as being called bad names by others in the community, which remained low in Kebbi (15%) and Zamfara (17%) but considerably higher in Sokoto (34%).

MNCH+N

Antenatal care: In Kebbi, there was an increase in the percentage of women who made their first antenatal care (ANC) visit during their first trimester, rising from 31% at baseline to 36% at endline. However, this percentage remained unchanged in Sokoto, with 26% at baseline and 25% at endline. In Zamfara, there was a slight decrease, with 21% at baseline and 16% at endline. The vast majority of pregnant women who went for ANC attended either a government hospital or primary health care, with slight increases in each of the three states (Kebbi: 87% at baseline and 92% at endline; Sokoto: 79%

at baseline and 82% at endline; Zamfara: 88% at baseline and 90% at endline).

There was a marked improvement in all three states in the services provided during ANC visits for women who attended. Over 90% of the women who attended had their blood pressure measured, and most had urine (Kebbi: 66% at baseline and 78% at endline; Sokoto: 67% at baseline and 77% at endline; Zamfara: 80% at baseline and 88% at endline) and blood samples taken (Kebbi: 72% at baseline and 91% at endline; Sokoto: 78% at baseline and 76% at endline; Zamfara: 82% at baseline and 92% at endline). The discussion of a child's due date with a provider also showed improvement, with increases in Kebbi (45% to 73%), Sokoto (40% to 52%), and Zamfara (54% to 84%). However, the distribution of mosquito nets during ANC visits decreased in all states. Over 60% of women at endline reported taking iron supplements during their most recent pregnancy, while over 40% reported taking folic acid. In all three states, there were improvements in both indicators, except for folic acid supplement uptake, which saw only a marginal increase in Zamfara.B

Although attendance of 4+ ANC visits remained low, there was a notable increase in the percentage of women who were aware of the recommended number of ANC visits in all three states, with the largest increase occurring in Kebbi (29% at baseline, 51% at endline) but notable increases in the other two states as well (Sokoto: 36% at baseline, 45% at endline; Zamfara: 50% at baseline, 59% at endline. Among women who chose not to make any ANC visits during their last pregnancy, the most common reasons were a lack of perceived need, spousal opposition, facility distance, and fatalism ("Up to God"). Other provider-side barriers, such as closed facility, mistrust of provider, poor treatment by provider, poor quality of service, or absence of a female provider, were generally cited by fewer than 2% of respondents in Kebbi and Sokoto, but by slightly more in Zamfara but still fewer than 5% of respondents.

The development of a birth plan with the assistance of a healthcare provider does not seem to be a common practice in the study areas. The endline results indicate a continued need for more intensive SBC messaging to improve this practice in the future. At endline, only Zamfara state had more than 50% of women reporting discussions of birth plans with a healthcare provider, which was a significant increase from 35% at baseline. Of the women who had discussions about birth planning, the discussion mostly centered on the delivery location.

ANC decision-making, self-efficacy, and intentions: Husbands clearly play an important role in the use of antenatal and other pregnancy-related care. Nearly all women in Kebbi (94%) reported that their husband influences their decision to make 4 or more ANC visits. Women acknowledge the importance of discussing their pregnancies with their husbands, and this recognition increased in all three states over the study period (Kebbi: 91% at baseline and 95% at endline; Sokoto: 88% at baseline and 91% at endline; Zamfara: 95% at baseline and 97% at endline). Commendably, there were also improvements in women's confidence in initiating a conversation with their husband about ANC (Kebbi: 77% at baseline and 78% at endline; Sokoto: 65% at baseline and 75% at endline; Zamfara: 74% at baseline and 86% at endline).

Breakthrough ACTION/Nigeria SBC efforts may have improved ANC knowledge and beliefs in Kebbi, where there were notable declines in the number of respondents agreeing with ANC-related myths. In contrast, myths about ANC remain common in Sokoto and Zamfara states, where beliefs in these myths may have actually increased since the baseline. For instance, the percentage of women who agreed that only first-time pregnant mothers need ANC decreased from 44% to 38% in Kebbi, while it increased in Zamfara from 34% to 39%. In regression adjusted models, this yielded a DID of -17 pp.

Facility delivery: Across all three states, there were large reductions in the percentage of births assisted by family, friends, and neighbors, with much of this reduction made up for by increased reliance on traditional birth attendants in Kebbi and by doctors, midwives, and community health workers (CHWs) in Zamfara. The most common reason for not delivering in a health facility was that it was "not necessary to go," but this reason declined in importance in all three states: Kebbi (76% at baseline, 45% at endline), Sokoto (74% at baseline, 58% at endline), Zamfara (61% at baseline, 37% at endline).

As with ANC, the majority of women (Kebbi: 93%: Sokoto: 85%; Zamfara: 81%)) reported that their husbands influence their decision to have a facility delivery. Even so, while husbands are critical to decision-making, discussions with husbands about where to deliver are infrequent; only 21% of women in Kebbi, 13% in Sokoto, and 30% in Zamfara reported that they had discussed where to deliver. This absence of discussion is puzzling, as most women—66% in Kebbi, 56% in Sokoto, and 71% in

Zamfara—indicate that they are confident that they could initiate such a discussion.

While many women cited lack of perceived need as a reason for not delivering in a health facility, 73% (Kebbi), 53% (Sokoto), and 64% (Zamfara) of women agreed that a health facility is the best place to deliver a baby, with larger increases in the integrated states relative to Zamfara (adjusted DID Kebbi—Zamfara: 12 pp; adjusted DID Sokoto—Zamfara: 4.5 pp), although these estimates were not statistically significant. Further, increasing majorities of women in Kebbi: (56% at baseline, 63% at endline) and Zamfara (53% at baseline, 66% at endline) reported intentions to deliver their next child at a health facility.

Newborn care: Among women who delivered in a health facility, nearly all newborn practices improved in all three states. The percentage of newborns who were wiped dry after birth increased in Kebbi (89% at baseline, 97% at endline), Sokoto (84% at baseline, 95% at endline), and Zamfara (94% at baseline, 97% at endline). The percentage of mothers who reported placing the newborn on a bare chest immediately after birth also increased in Kebbi (56% at baseline, 78% at endline) and Zamfara states (65% at baseline, 84% at endline), while Sokoto experienced a decline from 72% at baseline to 60% at the endline. At endline, nearly all babies delivered in facilities had their umbilical cord cut with a new blade (Kebbi: 98%, Sokoto: 96%, Zamfara: 98%), an improvement from baseline (Kebbi: 82%, Sokoto: 94%, Zamfara: 92%). About three quarters of facility-born infants at endline in Kebbi (76%) and Zamfara (77%) had chlorhexidine applied to their stump at the endline, higher than in Sokoto (61%).

Among babies delivered outside of formal health facilities, the above practices were less commonly followed. The percentage of newborns who were wiped dry after birth decreased in Kebbi (48% at baseline, 29% at endline), increased in Sokoto (42% at baseline, 49% at endline), and decreased in Zamfara (43% at baseline, 29% at endline) (Table 6.3.1b). Most babies delivered at home were bathed (78% in Kebbi, 79% in Sokoto, and 72% in Zamfara), and nearly all of these were bathed in the first 24 hours. Placing the newborn on the mother's bare chest immediately after birth was uncommon, performed for only 30% of newborns in Kebbi, 4% of newborns in Sokoto, and 15% of newborns in Zamfara at endline.

Breastfeeding and nutrition: While more than 95% of children in all three states were breastfed at some point, initiation of breastfeeding within one hour of birth (e.g., immediate breastfeeding) was low at baseline and trended downward at endline: 42% at baseline and 39% at endline in Kebbi, 32% at baseline and 24% at endline in Sokoto, and 46% at baseline and 43% at endline in Zamfara. Further, exclusive breastfeeding among children under 6 months of age was lower in Kebbi (17%), Sokoto (11%) and Zamfara (37%) at endline, as compared with baseline values of 20%, 29% and 46% respectively. This low coverage is in large part due to high rates of giving non-breastmilk liquids to a child in the first three days after birth. This practice increased in all three states, from 77% to 80% in Kebbi, from 70% to 89% in Sokoto; and from 50% to 66% at endline in Zamfara. Notably, while spousal opposition to breastfeeding declined in Sokoto (baseline: 25%, endline: 15%) and Zamfara (baseline: 30%, endline: 25%), it increased twofold in Kebbi (baseline: 37%, endline: 73%). Although there was high awareness of breastfeeding and its benefits, only about half of respondents in Kebbi (44%) and Sokoto (44%) and almost three in four women in Zamfara (70%) at endline felt confident that they could exclusively breastfeed their child for the first six months, a similar or modest increase from baseline (Kebbi: 39%, Sokoto: 44%, Zamfara: 65%)

Regarding complementary feeding, the majority of respondents reported feeding their child solid or semi-solid food three or more times a day (Kebbi 67%, Sokoto 53%, Zamfara 58%), with an increase observed at the endline (Kebbi 80%, Sokoto 63%, Zamfara 70%). However, the proportion of women feeding their children twice a day decreased (Kebbi 24% to 14%, Sokoto 29% to 23%, Zamfara 29% to 18%).

Grains were the most commonly given food group (Kebbi 85-88%, Sokoto 88-89%, Zamfara 84-86%). Dairy consumption remained low, with minimal improvement (Kebbi 48% to 34%, Sokoto 53% to 43%, Zamfara 57% to 58%). Consumption of beans, nuts, and Vitamin A-rich foods was relatively low across all states. To improve feeding practices, emphasis should be placed on nutrient-dense complementary foods. Specific food groups, such as dairy products, beans, nuts, and Vitamin A-rich foods, require attention. Tailored messaging through social and behavior change communication interventions should promote a diverse and culturally appropriate diet. Contrasting feeding frequencies and food group consumption between baseline and endline provide insights for future directions in interventions and areas of improvement.

Vaccination: In spite of small increases in vaccination rates from baseline to endline, vaccination coverage remained low in all three states. The percentage of children aged 12–23 months who had received all basic vaccinations (BCG, measles, DPT3, polio3) increased from 4% to 9% in Kebbi and from 8% to 15% in Zamfara but remained unchanged in Sokoto (4%). The most common reason for not receiving all vaccinations was spousal opposition, which increased from 30% to 54% in Kebbi, from 34% to 45% in Sokoto, and from 33% to 47% in Zamfara. Relatedly, an increased percentage of women across Kebbi (73% at baseline, 93% at endline), Sokoto (74% at baseline, 84% at endline) and Zamfara (73% at baseline, 82% at endline) said that the decision to vaccinate a child was influenced by their spouse. Considering that husbands were the top barriers and also top influencers for childhood vaccination, this reinforces the importance of targeting spousal opposition and engaging men.

From the endline results, it is clear that promoting norms and awareness of the value of routine vaccinations should be a priority area for SBC efforts. There was increasing agreement among respondents that people trust health providers with vaccination services, with notable improvements since the baseline survey, from 76% to 82% in Kebbi, from 61% to 76% in Sokoto, and from 80% to 92% in Zamfara. Further, most respondents at endline, 85% in Kebbi, 75% in Sokoto, and 81% in Zamfara, agreed that childhood vaccinations were effective in preventing illnesses, similar to baseline (Kebbi: 74%, Sokoto: 68%, Zamfara: 73%). However, the percentage of women who believed that vaccines contain dangerous chemicals that could harm a child showed no improvement at endline in Sokoto (26% at baseline, 29% at endline) and Zamfara (baseline: 23%, endline: 26%), but moved substantially lower in Kebbi (34% at baseline, 21% at endline). While trust in immunization health workers has improved, mistrust of vaccines themselves remains an area of attention for SBC programs, particularly since there is increasing attention to vaccination in relation to COVID-19 vaccines in this area and throughout Nigeria.

Acute respiratory infections: Rates of care-seeking from any medical source for children with symptoms of ARI were high and remained similar to those at baseline in Kebbi (87% at baseline, 85% at endline) and Zamfara (81% at baseline, 84% at endline) but increased in Sokoto (71% at baseline, 85% at endline). There was an increase in the percentage of children with symptoms of ARI that were taken for formal care in Sokoto (42% at baseline, 50% at endline) and Zamfara (28% at baseline, 32% at endline) but a decrease in Kebbi (39% at baseline, 28% at endline). The decline in Kebbi was offset by increased use of informal providers (48% at baseline, 57% at endline). Nonetheless, there was a large increase in the percentage of children with ARI symptoms who received antibiotics in Kebbi (41% at baseline, 63% at endline), a smaller increase in Sokoto (26% at baseline, 38% at endline), and a sharp decrease in Zamfara (53% at baseline, 28% at endline). Even with the increases in Kebbi and Sokoto, and especially with the decline in Zamfara, it is apparent that many children with ARI symptoms are still not treated with antibiotics.

Despite high treatment rates, the level of knowledge about pediatric pneumonia among caregivers is low. At both baseline and endline, only 38% of respondents in Sokoto and 36% in Zamfara with a child under 2 years recognized rapid or difficult breathing as a sign or symptom of pediatric pneumonia. However, in Kebbi, the percentage of caregivers who recognized this symptom increased from 28% at baseline to 52% at endline, a nearly two-fold increase.

Diarrhea: Approximately three-quarters of children with diarrhea in the two weeks preceding the survey were taken for care. However, in all three states, there was a significant increase in care-seeking from informal private sources, such as pharmacies and drug shops. In Kebbi, this rose from 28% to 57%, in Sokoto from 24% to 40%, and in Zamfara from 44% to 55%. The increased use of informal sources coincided with a large decline in the utilization of formal sector care in Kebbi, dropping from 45% at baseline to only 21% at endline. Sokoto and Zamfara experienced much smaller declines in formal sector care. Despite the decreased reliance on the formal sector, the percentage of children with diarrhea who were given ORS and zinc together, the gold-standard for treating diarrhea, increased from 16% to 30% in Kebbi and from 12% to 22% in Sokoto. In Zamfara, however, the percentage of children with diarrhea given ORS and zinc fell slightly from 27% to 23%. Nevertheless, only a minority of children received appropriate treatment in any of the states, potentially an indication of poor-quality care provision for diarrhea treatment due to the lack of zinc and ORS commodities and inadequate knowledge of appropriate diarrhea treatment protocols at informal providers.

Diarrhea treatment knowledge improved substantially between baseline and endline in Kebbi and Sokoto relative to Zamfara. Knowledge of zinc as effective treatment increased from 38% to 68% in Kebbi and from 22% to 42% in Sokoto, but by slightly less in Zamfara, from 50% to 65%. By endline, nearly all women in all three states knew that diarrhea can lead to dehydration and death, but again improvements in this indicator were largest in Kebbi, where it increased by 12 pp (from 85% to 97%), relative to Sokoto, where it increased by 3 pp from 88% to 91%, and Zamfara, where it decreased by 4 pp from 94% to 90%.

Albishirin Ku!

In the integrated states of Kebbi and Sokoto, Breakthrough ACTION/Nigeria conducts multilayered SBC programming across health areas through multiple channels, including radio, community events, household visits, opinion leader influencers, Airtel and mobile applications, predominantly through the umbrella of ***Albishirin Ku!*** branding. In Zamfara, Breakthrough ACTION/Nigeria conducts malaria community activities, absent the ***Albishirin Ku!*** branding, as well as malaria-specific radio spots that are run in all three states. While not focused on populations in Zamfara, ***Albishirin Ku!*** radio programming from Sokoto evidently spills over into the state.

Exposure to Breakthrough ACTION/Nigeria interventions, both branded and unbranded, increased from baseline to endline across all three states and for nearly all interventions. By the endline survey wave, self-reported exposure to any Breakthrough ACTION/Nigeria or ***Albishirin Ku!*** intervention had reached half of women in Kebbi, approximately six in ten women in Sokoto, and nearly three-quarters of women in Zamfara (Table 8.1.1). Exposure to any ***Albishirin Ku!*** radio component, as defined by Breakthrough ACTION/Nigeria, increased in all three states, with the largest increase being observed in Zamfara (35.5% at baseline, 57.4% at endline), followed by Sokoto (40.3% at baseline, 54.1% at endline) and Kebbi (25.3% at baseline, 32.1% at endline). At endline, exposure to ***Albishirin Ku!*** radio programming was highest in Zamfara, nearly twice the exposure level in the integrated state of Kebbi. The increases in exposure to ***Albishirin Ku!*** radio content increased across components. Notably, the increases in exposure to ***Albishirin Ku!*** were reflected across all wealth quintiles in all the three states, and particularly among the poorest.

In Kebbi, one in ten women at endline reported participating in a Breakthrough ACTION/Nigeria community event/dialogue, while one in five reported a home visit by a Breakthrough ACTION/Nigeria community volunteer (CV). Reporting of exposure to Breakthrough ACTION/Nigeria community events was lower in Sokoto. While 12% of women reported participating in a community dialogue, only 3% of women reported that it had Breakthrough ACTION/Nigeria branding. Similarly, while 10% of women reported a home visit by a CV, only 3% reported that it involved Breakthrough ACTION/Nigeria branding. As recall of specific logos may have been difficult for respondents, the true levels of exposure are likely to be bounded by the estimates of unbranded and branded exposure. As designed, almost no women in Zamfara reported exposure to Breakthrough ACTION/Nigeria branded community dialogues nor to household visits.

Trends by socioeconomic status: We examined changes in key indicators by state and by wealth quintile to determine if changes occurred more rapidly among some wealth groups relative to others. Overall, the most vulnerable, women in the lowest wealth quintile, showed improvements in most indicators, often substantially. Improvements in indicators were evident across all wealth groups, and there was little evidence that the poorest households fared better or worse than less poor households.

We also compared trends in indicators by levels of mother's education to determine if changes were experienced to the same extent across each of these groups. Generally, the data suggests that women with primary education in Kebbi experienced the most significant overall improvements across the studied indicators, while women with secondary+ education in Sokoto saw the greatest declines. However, the outcomes for women with Islamic education and no education showed mixed results, with both groups exhibiting smaller improvements or larger decreases compared to women with primary or secondary+ education in most instances.

Self-efficacy and couples' communication: The role of husbands in health behaviors is significant. They influence maternal and child health outcomes both directly through decisions about using healthcare and indirectly through their attitudes, norms, and beliefs. Women understand the importance of discussing their health with their husbands. Nearly all women at both baseline and endline agreed that discussing their pregnancies with their husbands is important. Additionally, over 70% of women believed it was important to discuss

contraception with their husbands, a slight improvement from baseline to endline in Sokoto and Zamfara but unchanged in Kebbi.

Women's confidence in initiating health discussions with their husbands improved across all states, though the level of confidence varied by topic. At endline, around 80% of women felt confident discussing attending ANC with their husbands (Kebbi: 80%, Sokoto: 74%, Zamfara: 84%) and about two thirds felt confident discussing, a facility delivery (Kebbi: 66%, Sokoto: 56%, Zamfara: 71%) or breastfeeding (Kebbi: 59%, Sokoto: 57%, Zamfara: 81%). For all areas, confidence in initiating discussions was higher in Zamfara than in the integrated states.

Even so, for many behaviors, discussions within couples are rare. Rates of spousal communication about contraceptive use and family size, for example, were low and largely unchanged from the baseline. At endline, only 5% of women in Kebbi, 6% of women in Sokoto, and 12% of women in Zamfara reported that they had ever had a discussion with their spouse about the number of children to have. Rates were higher for discussions of contraceptive use, but considerably more common at endline in Zamfara (33%) than in Kebbi (16%) and Sokoto (17%).

Bringing it all together: Documenting changes in priority behaviors over the life cycle of Breakthrough ACTION/Nigeria encompasses only part of the story. In order to better understand how changes have been achieved, we looked to the underlying theoretical framework on which Breakthrough ACTION/Nigeria hypothesizes that behaviors are changed. In multivariate analyses, we examine the associations between measures of three hypothesized ideational domains of the Theory of Strategic Communication—cognitive, emotional, and social—with priority behaviors targeted by Breakthrough ACTION/Nigeria.

In the multivariate results, we are able to identify a strong role for self-efficacy and self-confidence. Women who are confident that they can convince their husbands to use modern contraception are almost twice as likely to use modern contraception (18.6% versus 9.7%, p=.006). Women who report confidence in starting a conversation with their husband about ANC are also more likely to complete IPTp3 (confident: 21.8%, not confident: 14.5%), although the association was not statistically significant (p=0.090). Women who feel confident to exclusively breastfeed their child are predicted to be twice as likely to do so, with an adjusted probability of 40.6% compared to 20.1% among those who felt less confident.

Attitudes, beliefs, and knowledge are also associated with behaviors. For example, the belief that medicine given to pregnant women works well to prevent malaria was associated with a likelihood of 21.7% of IPTp3, relative to a likelihood of only 3.2% if a woman did not hold a belief in the efficacy of antimalarials during pregnancy. Women with more accurate knowledge of the timing and value of exclusive breastfeeding are predicted to be more likely to report exclusive breastfeeding their most recently born child for the first six months of life. For example, agreement that breastmilk contains essential nutrients for the first six months of life was associated with an adjusted probability of exclusive breastfeeding of 35.2%, as compared to 20.9% among those who disagreed or did not know. Agreement with the statement that couples who used contraception was associated with a higher probability of using modern contraception (16.6% compared to 6.4% for those who disagree or don't know), a difference that is statistically significant.

Education also matters. For example, the adjusted probability of a woman using modern contraception shows sizable increases with her level of education. For women with no education, the probability is 15.9%. This increases to 20.6% for those with primary education and further to 25.7% for women with secondary or higher education. A husband's education is also important. Higher levels of education for husbands seem to increase the likelihood that a woman received IPTp3**.** If the husband has a primary or tertiary level of education, the woman's probability of receiving IPTp3 increases to 26.5% and 24.8%, respectively, relative to only 17.3% if the husband has no formal education.

In a different vein, we found little evidence across any of the outcomes that exposure to Breakthrough ACTION/Nigeria SBC interventions is associated with a greater likelihood of engaging in priority behaviors. Controlling for all other factors, women who self-report exposure to any malaria jingle on the radio are no more likely to receive three or more doses of SP/F than women who do not (exposed: 21.7%, unexposed: 20.5%, p=.64). Women who reported participating in any community event with a CV were actually predicted to be less likely to complete IPTp3 (participated: 18.4%, did not participate: 21.2%, p=.443). Only for household visits by a CHW was there evidence to suggest an effect (visited: 24.7%, not visited: 20.6%),

but this association did not reach conventional levels of statistical significance (p=0.150).

We are of course unable to establish causal links between ideational factors and behaviors, as well as between exposure to Breakthrough ACTION/Nigeria interventions and those behaviors, for a number of reasons. Sample selection is an obvious problem with observational data; women holding certain attitudes and beliefs may be quite different from women who do not hold those attitudes and beliefs. Women who hear malaria jingles may be different from women who do not even controlling for differences in socioeconomic status. If women with more positive attitudes toward ANC and the efficacy of antimalarials are more likely to get three or more doses of SP/F, then it could be because of those attitudes or it could simply be due to some other characteristics of women with those attitudes and beliefs for which we are unable to control (e.g., proximity to services, stronger social networks).

Further, with cross sectional data, we are plagued by uncertainty about time order. Attitudes, beliefs, and norms. Attitudes are assessed at the time of the interview, while reporting of behaviors are measured retrospectively and refer to past events. This temporal discrepancy introduces the possibility for example that having engaged in a behavior, such as completing IPTp3, could influence a woman's sense of self-efficacy, as recorded during the interview, rather than the reverse—that more confident women are more likely to undertake IPTp3. Both scenarios are plausible and likely co-occur.

This leaves us in an unfortunate position. Attitudes, beliefs, norms and self-efficacy are clearly related to behaviors. But do they necessarily cause those behaviors? Measures of exposure to Breakthrough ACTION/Nigeria interventions do not correlate with priority behaviors. But do the interventions work indirectly through other means?

Conclusion

This research has sought to test whether integrated SBC is more effective than vertical, mono-focused SBC. This hypothesis is based on the belief that integrated SBC programming allows for a more holistic approach to health and greater access to care; multiple health issues, for example, can be targeted by a single radio program or a single home visit. Integrated SBC can also address multiple determinants of health behaviors (e.g., norms, beliefs, attitudes) or single determinants that touch on multiple health behaviors (e.g., women's empowerment). Further, integrated programming can lead to efficiency gains from shared inputs in program delivery, leading to less duplication of inputs and efforts and therefore to cost savings.[b,c]

Overall, in this context in northwest Nigeria, the integrated SBC programming of Breakthrough ACTION/Nigeria appeared to perform better than the vertical (malaria-only) programming across some indicators, while the vertical programming also demonstrated strength in some areas. There were clear improvements in the integrated states in treatment of childhood illnesses like diarrhea and pneumonia, which were priority areas for Breakthrough ACTION/Nigeria. For other areas, such as MNCH and family planning, many of the improvements in the integrated states were mirrored in Zamfara, for reasons that remain unclear. One possible explanation was the extensive spillover of integrated radio messaging from Sokoto to Zamfara. For malaria, Zamfara performed clearly better in the areas of access to and use of LLINs for under twos and pregnant women, but that improvement was potentially due to forces exogenous to the SBC program; mass LLIN distribution occurred in Zamfara in 2020 but at least two years earlier in the integrated states.

Future research

This study has also revealed areas likely to warrant further exploration beyond the study's original scope. First, husbands are clearly highly influential in decisions to use any form of health care, and this study has found that this influence may have increased since the baseline. Across all three states, approximately nine out of ten women say that a husband influences her decisions about breastfeeding, care-seeking for child illnesses, and using contraception. Importantly, as husbands' influence has grown, their opposition to many of the key health behaviors has also grown. Spousal opposition as a reason for not vaccinating children increased in all states, from 30% to 54% in Kebbi, from 34% to 45% in Sokoto, and from 33% to 47% in Zamfara. Spousal opposition to contraception

[b]Atun, R., de Jongh, T., Secci, F., Ohiri, K., & Adeyi, O. (2010). Integration of targeted health interventions into health systems: a conceptual framework for analysis. Health Policy and Planning, 25(2), 104-111. https://doi.org/10.1093/heapol/czp055

[c] Dudley, L., & Garner, P. (2011). Strategies for integrating primary health services in middle-and low-income countries at the point of delivery. The Cochrane Database of Systematic Reviews, 7, CD003318. Link: https://doi.org/10.1002/14651858.CD003318.pub3

increased as a reason for non-use in both Kebbi (14% to 25%) and Sokoto (18% to 24%).

The implications of this are evident. A stated objective of Breakthrough ACTION/Nigeria is to encourage joint decision making and communication within couples about health, particularly for taboo topics or for areas considered women's issues. In a positive sense, "influence" may be beneficial if it reflects careful and considered input from husbands as opposed to unilateral directives. On the other hand, greater involvement of husbands in health decision-making could also backfire for women and children if the husbands are not supportive of certain health services.

Second, Sokoto, an integrated SBC state, showed fewer improvements in a number of key health behaviors targeted by Breakthrough ACTION/Nigeria. These trends were evident not just in the BSS but also in the 2021 Multiple Indicator Cluster Survey and the 2021 Malaria Indicator Survey in Nigeria.[d,e] It would be useful to explore what other differences across the states—both those related to SBC and other contributory factors—can help to explain apparent lower levels of effectiveness of SBC in Sokoto state. One possibility could be that community dialogues and household visits, which were much more prevalent in Kebbi relative to Sokoto, could be particularly effective relative to other Breakthrough ACTION/Nigeria SBC interventions. Their absence in Sokoto may have contributed to lower effectiveness.

Third, low perceived need for health care remains a significant issue. At endline, in seven out of ten cases, the reason that a child with fever was not given a malaria test was because it was "not necessary" or "up to God." Similarly, nearly half of women agreed either that only first-time mothers or pregnant women who are sick need ANC. Further, such perceptions may reflect hidden opposition by spouses or other family members. It is notable that husbands' support for childhood vaccinations fell in all three states, potentially stalling improvements in these indicators. Regardless, a more detailed examination is needed of the specific perceptions held by wives and husbands which lead them to refrain from utilizing essential health services.

[d]National Bureau of Statistics (NBS) & United Nations Children's Fund (UNICEF). (2022). Multiple Indicator Cluster Survey 2021, Survey Findings Report. Abuja, Nigeria: National Bureau of Statistics and United Nations Children's Fund.

[e]National Malaria Elimination Programme (NMEP) [Nigeria], National Population Commission (NPC) [Nigeria], & ICF. (2022). Nigeria Malaria Indicator Survey 2021 Final Report. Abuja, Nigeria, and Rockville, Maryland, USA: NMEP, NPC, and ICF.

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, 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, 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 family planning (Babalola et al. 2015; Hutchinson et al. 2021; Speizer and 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 family planning 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 family planning 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 family planning 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 family planning messages either through media or other sources (National Population Commission (NPC) [Nigeria] & ICF 2019), there is ample opportunity to effect change through social and behavior change (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 oral rehydration solutions (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 (NPC [Nigeria] & ICF 2019). The main causes of maternal deaths include hemorrhage, hypertension, and indirect causes. In 2018, 57% of women attended antenatal 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 Nigeria Malaria Indicator Survey (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 net (ITNs)/long-lasting insecticidal net (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 (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 (National Malaria Elimination Program (NMEP) [Nigeria], NPC [Nigeria], and ICF 2022).

Intermittent preventive treatment in 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 therapy (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. Within the cognitive domain are beliefs and values, which indicate the perception of either the positive or negative consequence of a healthy behavior, while 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

FIGURE A-1 PERCENTAGE OF WOMEN AGED 15–49 YEARS EXPOSED TO MALARIA SOCIAL AND BEHAVIOR CHANGE COMMUNICATION IN THE PAST 6 MONTHS, BY STATE

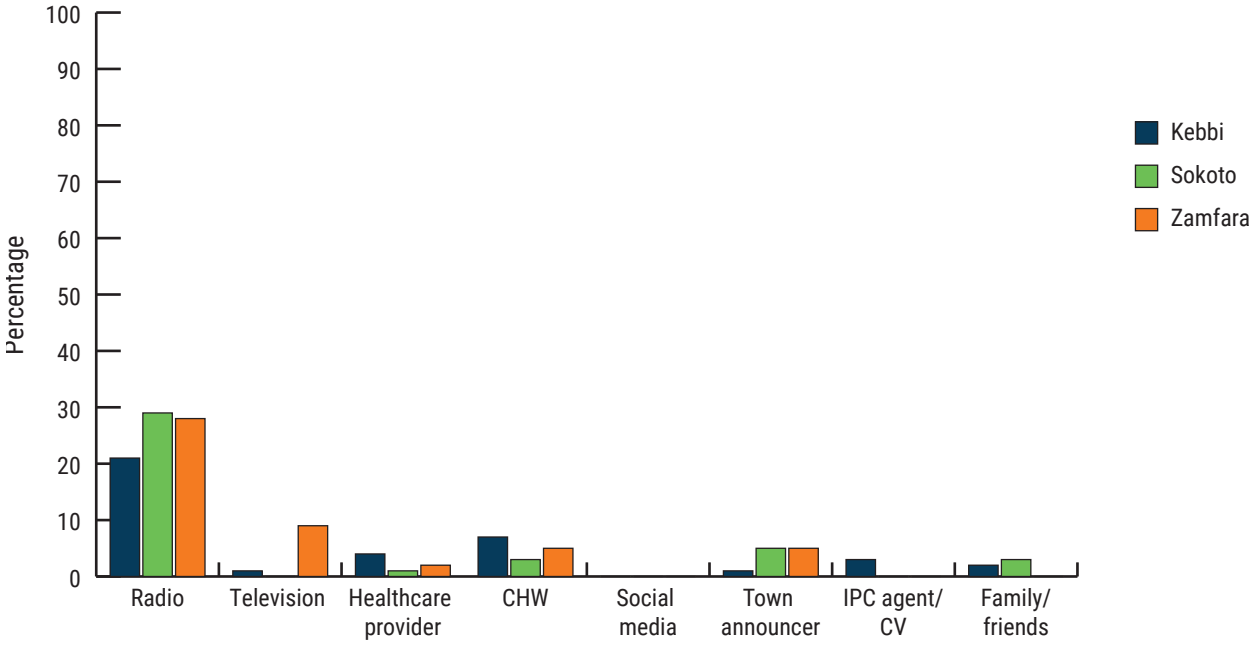
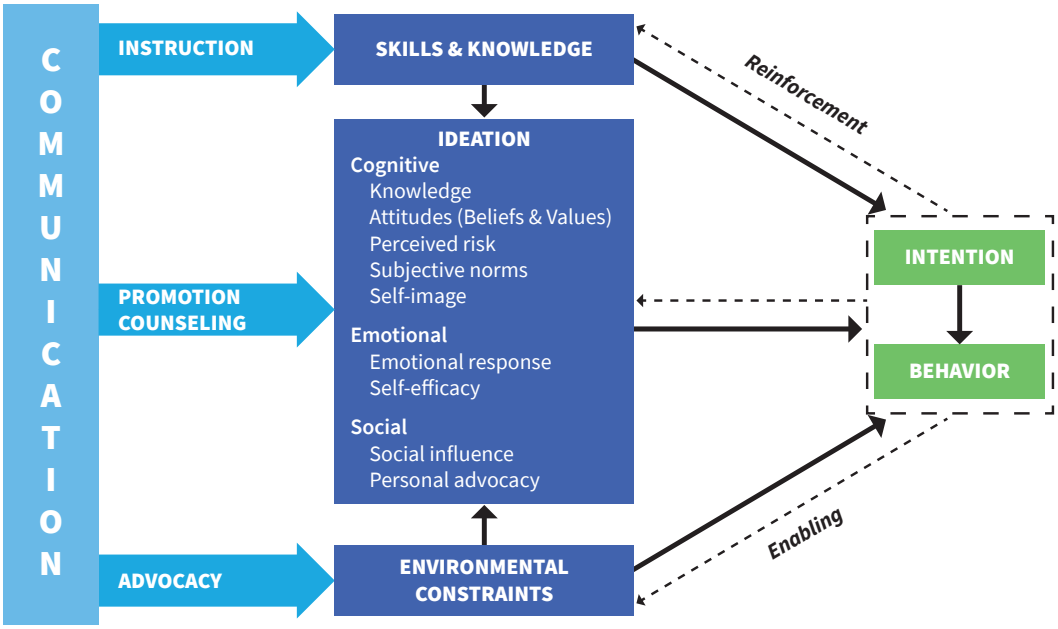


FIGURE A-2. THEORY OF STRATEGIC COMMUNICATION AND BEHAVIOR CHANGE



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. (eds.) *Public Communication Campaigns*, 4th edition. Newbury Park, CA: Sage, pp. 305–319.

person feels to be able 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 family planning 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 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.

Integrated versus health-area-specific SBC messaging

Breakthrough ACTION/Nigeria used a life stage approach to inform integrated SBC activities. Table A-1 describes the key objectives of each life stage and the target behaviors in each 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

TABLE A-1. KEY OBJECTIVES OF THE LIFE STAGE APPROACH FOR INTEGRATED SBC PROGRAMMING AREAS[†]

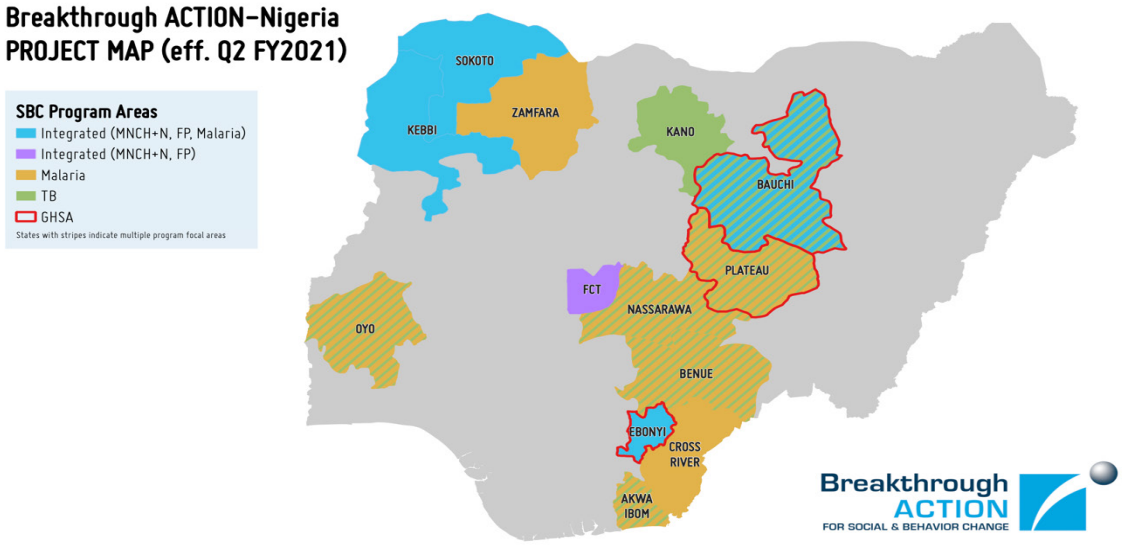
LIFE STAGE	OBJECTIVE
Life Stage 1 SBC messaging targeted to women planning for pregnancy and those in early pregnancy	Increase proportion of pregnant women who attend first ANC as soon as they become aware of pregnancy and at least four times during pregnancy and up to eight times
	Increase proportion 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

also continues to implement SBC programming in support of USAID President's Malaria Initiative (PMI) malaria programming, service delivery partners, and commodities distribution.

Breakthrough ACTION in Nigeria: Program implementation

Breakthrough ACTION/Nigeria, led by Johns Hopkins University Center for Communication Programs (JHU CCP), leverages and expands the Health Communication

FIGURE A-3 MAP OF BREAKTHROUGH ACTION/NIGERIA AREAS



Capacity Collaborative (HC3) activities in Nigeria in three targeted states (Bauchi, Kebbi and Sokoto) (Figure A-3).

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 the integrated states starting in November 2020. Over the course of 2021, there were also rising insecurities in Zamfara and Sokoto states, 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, institutional review board approval was obtained to conduct the third wave of the BSS survey, in all three states.

BSS rationale and objectives

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, family planning, and MNCH+N. The specific overall study objectives include:

- Objective 1: Assess the effectiveness of integrated SBC programming relative to malaria-only SBC programming focusing on women with a child under 2 years of age.
- Objective 2: Collect and report on a selection of ideational and priority behavioral indicators across MNCH+N, malaria, and family planning for women with a child under 2 years living in Breakthrough ACTION/Nigeria program wards in Kebbi, Sokoto and Zamfara States between baseline and endline rounds 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 1 October to 10 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.

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

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

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

This Breakthrough RESEARCH/Nigeria study utilizes a cross-sectional, multi-round quasi-experimental design intended to compare the effectiveness of integrated SBC relative to vertical (malaria-only) SBC. Toward this end, difference-in-differences estimates were calculated. These compare changes from baseline to endline in indicators in Breakthrough ACTION/Nigeria programming areas with integrated SBC messaging (Sokoto/Kebbi) relative to changes in indicators in malaria-only SBC messaging (Zamfara). This design is premised on the hypothesis that changes in non-malaria indicators (e.g., family planning, MNCH) would improve faster in the integrated states of Kebbi and Sokoto, which received SBC messaging in these health areas, than in the malaria SBC only state of Zamfara, which would receive no SBC messaging or interventions related to family planning or MNCH. It was also hypothesized that, because of more intensive malaria SBC, indicators related to malaria prevention and treatment would improve more rapidly in the malaria-only SBC state relative to the integrated states.

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.

Sampling frame

A key difference between this study and other well-known population-based surveys is the focus here on a specific segment of the population—women and households within the 1,000 Day Window of Opportunity from pregnancy through the first two years of a child's life. Hence, the focus was on collecting data from a random sample of women and households within this group, and not from a representative sample of all women of reproductive age. Because childbearing does not typically occur evenly across the reproductive life cycle of a woman, our demographic is likely to different in important respects, most notably age and parity, from the random sample of all women of reproductive age.

TABLE A-3 2022 BSS SAMPLE DESIGN

	NUMBER OF LGA'S 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

TABLE A-4 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)

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 2 years. Clusters/wards 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.

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 endline round.

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 taken 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 both baseline, and endline rounds. Development of the questionnaires was done through a collaborative process involving relevant stakeholders, including Breakthrough ACTION/Nigeria, 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 family planning, malaria and maternal, newborn and child health and nutrition between wives with a child under two years of age and their husbands. Toward this end, a separate male questionnaire was developed for the midline round and used again for the endline round 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, family planning, 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 bed net 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.

It should be noted that the wording and substance of the questionnaires largely mirror those of other common population-based household surveys, including the Demographic and Health Surveys and the Malaria Indicator Surveys.

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 five field teams per state—on average each team consisted of one supervisor and six interviewers (four females and two 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 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 SPHCDA and SMOH 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. Each fieldwork team in Kebbi, Sokoto and Zamfara States had one supervisor and six interviewers (four females and two 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 and midline survey rounds. The following quality assurance checks were also conducted during data collection:

- Use of spatial data: The GIS team used the GPS co-ordinates captured on ODK during community screening to match the location of each interview within a certain buffer zone, ensuring that the interviewers went to the selected household. With the selected households uploaded to Qfield, interviewers were able to correctly locate their clusters and respondents and localization errors were minimized.
- Use of time stamps: The time stamps in the data (at the beginning, during and at the end of each interview) provide two pieces of important information for evaluating quality—the time the interview started and how long it took. Suspicious interviews were flagged. Secondly, if the interview was too long or too short (and if this happened beyond a tolerated threshold), the supervisor or interviewer was called in to provide an explanation.
- Interviewer performance dashboard: This 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.
- 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. Checks were made to ensure that the same interview was not uploaded twice, and, if duplicates occurred, the interviewer was asked to identify the correct version for upload. Checks were also made to ensure that all variables were properly captured, and a skip analysis was conducted to ensure no incorrect skip patterns occurred within the data.
- Clarity: Additional checks were made to ensure 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

Tables A-5 presents the study sample and response rates in the endline round for female respondents, respectively. Baseline response rates are provided in the baseline report.[f]

Ethical approval

The study protocol was approved by the National Health Research Ethics Committee of Nigeria (NHREC) 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.

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%

[f] https://breakthroughactionandresearch.org/wp-content/uploads/2020/07/BR_Nigeria_BSSBsln_Report.pdf

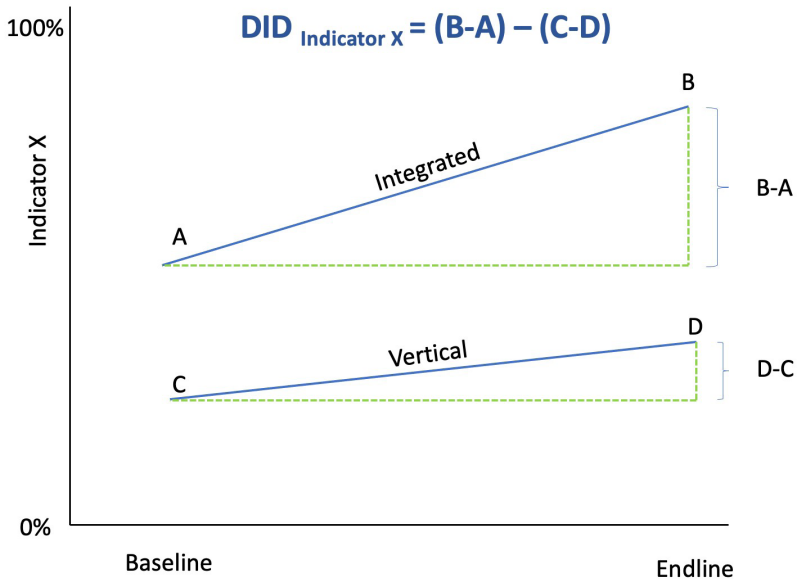
Data analysis

Because this study is intended primarily as a test of the effectiveness of integrated versus vertical SBC, comparisons are made between changes in indicators from baseline to endline in integrated states (Kebbi and Sokoto) relative to changes in those same indicators in the vertical state (Zamfara). These are referred to as difference-in-differences (DID) estimates (Figure A-3). Difference-in-differences estimates, as the name states, examine two sets of differences at the same time. The first difference is the change in an indicator (e.g., current modern family planning use) from baseline to endline in an integrated state. In the figure below, the line from A to B represents the change in Indicator X from a value of A% at baseline to B% at endline in an integrated state, yielding a difference of (B-A). This difference is then compared with the difference from baseline to endline in the same indicator in the vertical state, from C% at baseline to D% at endline yielding a change of (D-C). Subtracting one state's change from the other state's change yields the difference-in-differences estimate, in this case, (B-A)-(D-C).

Because we were concerned that contextual factors (e.g., security, resources, drug and supplies availability) might differently affect outcomes in the two integrated states, we have treated Kebbi and Sokoto as separate domains. We therefore present separate DID estimates for key indicators for the two states: (1) the DID estimate of Kebbi relative to Zamfara and (2) the DID estimate of Sokoto relative to Zamfara.

We present statistical tests only for the DID estimates since these are the most relevant for assessing the effectiveness of integrated SBC versus vertical SBC, which represents the primary objective of this research. We focus only on the Breakthrough ACTION/Nigeria priority behaviors (Table A-3), as well as selected beliefs, attitudes, and intentions that drive key behaviors in each health area (e.g., malaria, family planning, MNCH). Consequently, in the two right-most columns of the tables for the priority indicators, we present: (1) the unadjusted DID estimate for the integrated state (Kebbi or Sokoto) relative to vertical state (Zamfara) and (2) the adjusted DID estimate for the integrated state (Kebbi or Sokoto) relative to vertical state (Zamfara). The unadjusted DID estimate is taken from the linear regression of an indicator (e.g., modern contraceptive use) on three variables: a state-level dummy variable (Kebbi versus Zamfara or Sokoto versus Zamfara), a survey wave dummy variable (endline versus baseline), and an interaction of the two variables. The coefficient for the state-wave interaction represents the DID estimate.

FIGURE A-3 DIFFERENCE-IN-DIFFERENCES ESTIMATES



For the adjusted linear regression models, we include controls for a mother's age (in five-year age ranges from 15-19 through 45-49), mother's education (primary, secondary or higher, and Islamic education relative to no education), and wealth quintile. These latter models control for the fact that women in Zamfara tend to be from wealthier households and more educated. Both education and wealth have traditionally been shown to affect health behaviors and the use of health services. Not controlling for these differences between Zamfara and the integrated states might erroneously attribute the effects of education and wealth to SBC program effects, leading to over- or under-estimates of program effects. Regressions were run separately for Kebbi versus Zamfara and for Sokoto versus Zamfara. It is these latter adjusted

DID estimates (the right-most column) that we primarily discuss in the text.

In many cases, most notably for indicators for which we do not provide DID estimates, we also discuss the within-state changes in indicators but do not present tests of statistical significance associated with these. We present these within-state changes because the DID estimates can sometimes obfuscate overall patterns. For example, we occasionally found only a small improvement (or no improvement) in Kebbi or Sokoto, but a large decline in Zamfara. In such cases, this would yield a positive and sizable DID in favor of the integrated states. However, the positive DID might not be attributable to successful integrated SBC but rather a worsening in Zamfara, likely for exogenous reasons (e.g., stockouts). So, in these cases, discussing the within state changes made sense.

These within state changes in indicators from baseline to endline are not accompanied by tests of statistical significance for two main reasons. First, changes within states are tangential to the principal research question, which involves comparing the difference in changes across states, not the difference within a state. Second, we are aiming for clarity of presentation and a report that is concise in its focus. Presenting tests for changes in indicators within a state would require adding several additional columns to the tables to represent the magnitude of the change within each state and a measure of statistical significance for the difference in means from baseline to endline. Therefore, when we discuss changes within a state (e.g., indicator X increased from aa% at baseline to bb% at endline), our focus is descriptive rather than statistical.

Again, to not overwhelm readers with numbers and to have manageable table widths, we use asterisks to indicate the level of statistical significance for the DID estimates: *** represents p<.001, ** represents p<.01, and * represents p<.05. Rejection of the null indicates that differences from baseline to endline in integrated states differ from changes from baseline to endline in the malaria-only state of Zamfara. All analyses were conducted in Stata 17 (STATA Corp, College Station, TX).

All point estimates for indicators 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.

To construct measures of household wealth, we used the methodology of Filmer and Pritchett (1998), which is based on household ownership of specific assets and consumer durables. We constructed an asset-based measure of wealth based on ownership of key consumer durables. A wealth index 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.

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 locally and 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

Key findings

Study sample: Both baseline and endline surveys collected information from over 3,000 households with a woman of reproductive age and child under the age of two years (3,060 households at baseline, 3,130 households at endline). This yielded interviews with 3,020 women at baseline and 3,144 women at endline (Table 1.1.1).

Respondent Characteristics: Virtually all women were married at the time of the survey in both the baseline and endline waves (Table 1.1.2). In all states, there were statistically significant increases in older age groups. The mean age of women was higher by nearly two years in both Kebbi and Zamfara and by 1.5 years in Sokoto. While the older age of respondents in the endline wave may impact outcomes, it is assumed that, because the age changes are approximately equal in all states, the change in the age structure of the sample will affect estimates of outcomes in all three states equally.

In both Kebbi and Zamfara, there were also sizable increases in reporting of primary and secondary levels of education, alongside a sizable reduction in the percentage of women reported to have no schooling. Much of this change can be attributed to additional probing by interviewers at endline to ascertain if women had received Islamic education, which consequently increased by many multiples across all three states.

Similarly, in the endline survey, interviewers were instructed to collect more detailed information about women's employment than had been collected in the baseline survey. This led to considerable shifts in the categorization of women's employment. In all states, the percentage of women not working outside of home declined, with most of these women engaging in "sales/service" (Tables 1.1.3, 1.1.4). The detailed sources of employment for endline respondents show that many women are engaged in selling cheese/awara/kulikuli, petty trading, or being a food vendor. Almost no women were considered to be students or to be engaged in professional employment.

There generally were not statistically significant changes from baseline to endline in the composition of the sample by ethnicity or by wealth.

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	1,066	1,069	1,007	3,066	3,130
Women 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. FEMALE RESPONDENT CHARACTERISTICS

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

CHARACTERISTIC	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Marital status						
Married	99.1	99.0	99.2	99.1	96.8	98.5
Divorce/separated/widowed	0.9	1.0	0.8	0.9	3.2	1.5
Ho: BL=EL	F=0.03	P=.875	F=0.028	P=.868	F=1.11	P=.296
Age						
15–24 years	38.6	27.5	44.8	35.2	41.3	29.5
25–34 years	47.5	49.8	43.2	48.5	44.8	45.2
35–49 years	13.9	22.7	12.0	16.3	14.0	25.3
Ho: BL=EL	F=6.44	P=.004	F=3.94	P=.022	F=11.96	P=.000
Mean	25.9	27.9	25.5	27.0	26.3	28.4
p		P=.000		P=.000		P=.000
Education						
None	74.8	48.6	80.7	29.5	71.1	20.9
Primary	4.9	8.6	4.8	4.5	5.1	10.4
Secondary	8.9	12.6	3.8	4.8	13.6	25.7
Islamic	11.4	30.2	10.8	61.2	10.3	43.0
Ho: BL=EL	F=4.02	P=.023	F=13.50	P=.000	F=16.31	P=.000
Wealth quintiles						
Lowest	31.7	23.8	36.2	29.7	11.3	5.3
2nd lowest	21.7	19.6	21.3	25.0	19.1	13.9
Middle	17.9	24.0	20.5	20.0	21.2	17.8
2nd highest	13.0	19.9	11.0	13.5	23.9	27.4
Highest	15.8	12.7	11.0	11.8	24.4	35.6
Ho: BL=EL	F=1.03	P=.368	F=0.433	P=.700	F=2.00	P=.133
Ethnicity						
Hausa	69.9	78.1	92.3	94.9	91.7	94.9
Fulani	11.8	9.9	5.5	4.4	5.9	4.1
Badakare/Dakarkari	4.1	7.3	0.0	0.1	0.0	0.0
Other	14.2	4.7	3.2	0.7	2.4	1.0
Ho: BL=EL	F=1.28	P=.282	F=3.48	P=.033	F=1.37	P=.254
N	892	1,088	1,078	1,045	1,069	1,011

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

TABLE 1.1.3. FEMALE RESPONDENT CHARACTERISTICS

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

INDICATOR	KEBBI		SOKOTO		ZAMFARA	
	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %
Not working outside home	48.7	18.0	61.5	27.7	42.0	14.4
Student	0.3	0.1	0.8	0.2	0.9	1.2
Professional	2.5	4.6	0.8	3.5	2.0	4.1
Sales/service	16.6	46.6	14.1	48.7	18.7	52.3
Skilled manual labor	1.6	7.4	3.3	8.7	3.4	8.4
Unskilled manual labor	0.7	9.7	1.9	8.4	2.4	2.8
Agriculture	13.8	10.9	5.3	0.5	4.4	5.0
Domestic worker	12.5	0.8	19.5	0.3	21.1	5.3
Other	3.4	2.0	2.8	2.1	5.2	6.5
N	880	1,079	1,066	1,035	1,043	1,000

TABLE 1.1.4. FEMALE RESPONDENT OCCUPATIONS

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

MATERNAL OCCUPATION	KEBBI %	SOKOTO %	ZAMFARA %
Not working outside home	18.0	27.7	14.4
Food vendor/sales/service	12.6	13.6	10.9
Grinding	2.5	2.5	2.3
Pounding (Grain pounding)	9.7	8.4	2.8
Selling cheese/awara/kulikuli	17.5	18.6	25.3
Shea butter making	0.3	0.1	0.4
Student	0.1	0.2	1.2
Clerical	0.0	0.0	0.1
Domestic worker	0.8	0.3	5.3
Professional technical (civil servants)	2.1	0.9	1.7
Beads making	0.1	0.1	0.0
Cosmetology (Soap or cream making)	0.4	0.1	0.4
Furniture making	0.1	0.0	0.3
Hair braiding/styling	3.1	3.9	3.0
Henna design	1.5	1.0	1.7
Knitting bags	1.0	0.8	0.1
Pottery (Making traditional pots)	0.1	0.1	0.1
Tailoring	3.8	4.0	6.7
Weaving	2.1	3.6	0.7
Welder for bucket/pots/water basin	0.0	0.0	0.1
Petty trading (Buying and selling)	11.4	11.5	11.1
Contribution (Adashe)	0.3	0.2	0.3
Agriculture/animal rearing/poultry	10.9	0.5	5.0
Okada rider	0.2	0.0	1.5
Other	1.5	1.9	4.6
Total	100.0	100.0	100.0
N	1,079	1,035	1,000

Detailed occupation information was not asked in the baseline survey.

Chapter 2. Impact of Integrated versus Vertical SBC

Key findings

The primary objective of this study was to compare changes in indicators between the integrated states of Kebbi and Sokoto with the malaria-only vertical state of Zamfara. Toward that end, we examined trends in the Breakthrough ACTION/Nigeria priority indicators (Tables 2.1 and 2.2) in the integrated states relative to those in the vertical state using both unadjusted and adjusted DID models. The most important tests of integrated versus vertical SBC are in the area of malaria, where both approaches seek to change the same indicators, albeit with their different approaches. On other indicators (e.g., family planning, pregnancy-related care excluding IPTp, breastfeeding, child vaccinations and treatment of acute respiratory infections [ARI] and diarrhea), comparisons between the integrated and vertical states primarily test the effectiveness of integrated SBC versus no SBC, since Zamfara would have no SBC programming targeting these indicators. This comparison, however, is somewhat muddied by the extensive spillover of ***Albishirin Ku!*** radio programming from Sokoto to Zamfara.

Overall, the results suggest that integrated social and behavior change (SBC) interventions may offer benefits over vertical SBC, but external events, and disparate circumstances, and spillover may also have contributed to differences in trends. Our conclusions are therefore tempered by this possibility (Tables 2.1, 2.2).

Use of modern contraception improved in the integrated state of Kebbi relative to Zamfara, but this result was not statistically significant in either unadjusted or adjusted regression models (Adjusted DID=9.8 pp, p=.392). Contraceptive use indicators in Sokoto showed slight declines, leading to negative DID estimates relative to Zamfara, but these too were not statistically significant.

Independent of the SBC efforts of Breakthrough ACTION/Nigeria, ownership of LLINs, defined as a household having at least one LLIN, declined in the integrated states in the interval between the baseline and endline surveys, largely due to the absence of mass distribution campaigns. This resulted in quite divergent trends in ownership, access, and use of LLINs relative to Zamfara, where both ownership and use of LLINs increased. From baseline to endline, ownership of at least one LLIN in Zamfara increased from 74% to 88%. In contrast, the percentage of households having at least one LLIN decreased by 32 percentage points in Kebbi (from 78% at baseline to 46% at endline) and by 19 percentage points in Sokoto (from 80% at baseline to 61% at endline). The decline might have been even larger in Kebbi, but a LLIN mass distribution campaign began in the state just as data collection was wrapping up. One in five households in Kebbi reported receiving a net at this time.

In households in Zamfara with at least one LLIN, the percentage of pregnant women sleeping under an LLIN increased from 39% at baseline to 77% at endline, while the percentage of children under the age of 2 sleeping under an LLIN increased from 54% to 89%. Even with the long period since the last mass distribution campaigns, use among pregnant women in households with at least one LLIN increased in both Kebbi (29% at baseline, 51% at endline) and Sokoto (31% at baseline, 41% at endline). Similarly, among households with at least one LLIN, use by children under age 2 improved from 38% to 68% in Kebbi and from 47% to 66% in Sokoto. Nonetheless, the large increase in net availability in Zamfara yielded large adjusted DID estimates. For pregnant women sleeping under an LLIN in households with at least one LLIN, the adjusted DIDs were -15 pp in Kebbi and -24 pp in Sokoto, while the adjusted DID estimates for under-twos sleeping under an LLIN (in households with at least one LLIN) were -7 pp and -18 pp in Kebbi and Sokoto respectively. Only the adjusted DID estimates for Sokoto were statistically significant, however.

While pregnancy-related outcomes improved in both Kebbi and Sokoto, improvements were larger in Zamfara, where Breakthrough ACTION/Nigeria worked to improve the uptake of IPTp, a key component of ANC. For example, the percentage of women in Kebbi who made four or more ANC visits increased by 8 pp, from 24% at baseline to 32% at endline. However, this same indicator increased by a larger 12 pp in Zamfara, from 26% to 38%. A similar pattern was observed for facility deliveries as well. Consequently, none of the DID estimates for these

indicators were statistically significant. A similar pattern was evident for facility deliveries as well. While the percentage of women in Kebbi delivering in a health facility increased by 8 pp (from 15% to 23%), the percentage in Zamfara increased by just over 10 pp (from 16% to 26%). This pattern may in part reflect differences in the populations in the two states. Relative to respondents in Kebbi and Sokoto, respondents in Zamfara tended to have greater economic resources and higher education levels (see Table 1.1.2), which may directly or indirectly affect access and care-seeking behaviors. After controlling for these differences in regression analysis, we observe more pronounced improvements in Kebbi relative to Zamfara, as indicated by adjusted DID estimates of 3.5 pp for ANC4+, 4.0 pp. for facility deliveries, and 10.4 pp for IPTp, although these results are not statistically significant.

The integrated states generally performed better than the vertical state in terms of ensuring appropriate treatment for common child illnesses. Among children with fever in the two weeks preceding the survey, there were larger improvements in care seeking, testing for malaria, and giving ACTg in Sokoto relative to Zamfara. These were not mirrored in Kebbi. For example, treatment of diarrhea with ORS/zinc improved by 12 pp in Kebbi (from 18% to 30%) and by 11 pp in Sokoto (from 12% to 23%), as compared with a decline of 4 pp (from 27% to 23%) in Zamfara. Adjusted DID estimates for treatment with ORS/zinc were 24% in Kebbi and 16 pp in Sokoto. Similarly, treatment with antibiotics for children with ARI symptoms increased by 22 pp (from 41% to 63%) in Kebbi and by 12 pp (from 26% to 38%) in Sokoto, while this indicator declined by 24 pp (from 53% to 28%) in Zamfara during the same period. Again, this yielded large adjusted DID estimates: 45 pp in Kebbi and 35 pp in Sokoto. This latter result, however, may be attributable to frequent stockouts of antibiotics in Zamfara.

These improvements in child illness treatment came even as the use of formal sector providers in Kebbi declined for all three illnesses, from 45% to 21% for diarrhea, from 39% to 28% for ARI, and from 59% to 28% for fever. The use of the formal sector in Zamfara changed only slightly from baseline to endline, declining by 3 pp and 4 pp for diarrhea and fever care respectively and increasing by 4 pp for ARI. Lack of availability of key drugs and commodities in Zamfara may have contributed to the flat trend in appropriate treatment.

Breastfeeding indicators, including both immediate and exclusive breastfeeding, worsened in all three states, with none of the adjusted DID estimates being statistically significant. Full childhood immunization rates increased in both Kebbi and Zamfara, but the magnitudes of these changes, 4 pp in Zamfara and 3 pp in Kebbi, were so small as to be indistinguishable statistically.

[g]No question was asked about whether a given malaria test was positive, and hence it is not possible to determine the medical necessity of proving ACT for a given child with fever.

TABLE 2.1. PRIORITY INDICATORS AND DIFFERENCE-IN-DIFFERENCES ESTIMATES, KEBBI V. ZAMFARA

Percentage of priority behaviors in which women and households engaged, baseline and endline

	KEBBI		ZAMFARA		DIFFERENCE-IN-DIFFERENCES	
	BASELINE	ENDLINE	BASELINE	ENDLINE	UNADJUSTED	ADJUSTED
	%	%	%	%	PP	PP
Family planning						
Current modern family planning use	9.0	15.6	15.5	19.3	2.8	8.1
Postpartum family planning use	9.2	15.0	13.6	15.7	3.7	10.7*
Intention to start using modern contraception	15.4	11.6	17.7	21.6	-7.7	-4.6
Malaria prevention						
Ownership: Households with at least 1 LLIN	78.0	45.5	74.4	87.8	-46.0***	-44.0***
Full household coverage: Households with 1 LLIN for every two people	26.0	8.1	14.5	16.8	-20.2***	-19.1***
Access: Pct of pop that could sleep under an LLIN if each LLIN was used by 2 people	20.3	7.1	10.2	13.7	-16.7***	-15.9***
Pregnancy						
IPTp 3+ (last pregnancy)	23.7	33.3	19.1	21.4	6.2	10.4
Pregnant women sleeping under LLIN	22.7	27.0	30.5	70.1	-35.4*	-34.6*
Pregnant women sleeping under LLIN in households with at least 1 LLIN	28.6	51.4	39.0	76.7	-14.9	-15.1
ANC 1+ (last pregnancy)	42.1	45.9	38.2	48.4	-6.5	0.1
ANC 4+ (last pregnancy)	23.6	32.1	26.1	37.6	-3.2	3.5
ANC in first trimester	30.7	36.3	25.5	24.6	9.7	8.5
Made a birth plan	25.2	36.2	34.7	58.3	-9.5	-9.2
Facility delivery	14.8	22.8	16.3	26.6	-2.4	4.0
Newborn care						
Immediate breastfeeding	41.6	39.2	46.1	43.2	0.5	4.8
Placing baby on stomach immediately after birth	31.5	40.4	21.5	33.7	-3.3	1.8
Use chlorhexidine to cleanse umbilical cord	17.5	29.9	18.1	27.4	-0.6	7.4
Use misoprostol to stop bleeding	13.7	32.8	20.3	30.3	9.1	13.0
Child health						
All child vaccinations	2.4	5.8	5.9	10.3	-1.0	0.9
Exclusive breastfeeding	20.3	16.6	45.9	37.4	4.8	6.0
Under 2s sleeping under LLIN	31.0	30.6	40.1	78.5	-38.7***	-38.5***
Under 2s sleeping under an LLIN in households with at least 1 LLIN	38.4	67.8	53.9	89.1	-5.7	--7.3
Diarrhea						
Formal care	45.0	20.9	30.0	27.3	-21.3	-15.7
Child given ORS	51.8	47.5	56.0	42.7	9.5	22.8
Child given ORS/zinc	17.6	30.1	27.2	23.2	16.9	23.6*
Acute respiratory infection						
Formal care for ARI	39.3	28.1	28.1	32.2	-15.3	-14.7
Antibiotic for ARI	41.0	63.4	52.6	28.3	46.6**	45.3***
Fever						
Formal care for fever	58.6	27.8	35.3	31.7	-27.1*	-28.1*
Rapid diagnostic test	22.8	15.0	24.0	29.7	-13.7	-11.5
ACT given for fever	28.8	24.0	36.1	34.8	-3.3	-1.3
Was treatment sought same day or next day?	61.7	81.0	70.9	69.8	20.4	21.9

DID models were estimated using linear regression with state-level fixed effects (e.g., Kebbi, Sokoto) interacted with a dummy variable for endline wave. Regressions were run separately for Kebbi v. Zamfara and Sokoto v. Zamfara. Differences in sample sizes for different regression models mean that similar DID effect sizes may differ in statistical significance. In adjusted models, control variables include mother's education, age, and household wealth. *** p <.001, **p<.01, * p<.05

TABLE 2.2 PRIORITY INDICATORS AND DIFFERENCE-IN-DIFFERENCES ESTIMATES, SOKOTO V. ZAMFARA

Percentage of priority behaviors of women and households

	SOKOTO		ZAMFARA		DIFFERENCE-IN-DIFFERENCES	
	BASELINE	ENDLINE	BASELINE	ENDLINE	UNADJUSTED	ADJUSTED
	%	%	%	%	PP	PP
Family planning						
Current modern family planning use	11.3	9.4	15.5	19.3	-5.6	-0.8
Postpartum family planning use	9.7	7.8	13.6	15.7	-3.9	-0.6
Intention to start using modern contraception	8.3	12.9	17.7	21.6	0.7	3.6
Malaria prevention						
Ownership: Households with at least 1 LLIN	80.0	61.3	74.4	87.8	-32.3***	-32.2***
Full household coverage: Households with 1 LLIN for every two people	21.3	10.2	14.9	16.9	-13.5**	-13.3**
Access: Pct of pop that could sleep under an LLIN if each LLIN was used by 2 people	15.6	8.6	10.2	13.7	-10.5**	-10.3**
Pregnancy						
IPTp 3+ (last pregnancy)	14.9	14.8	19.1	21.4	-2.3	2.2
Pregnant women sleeping under LLIN	24.0	26.4	30.5	70.1	-37.3***	-31.3**
Pregnant women sleeping under LLIN in households with at least 1 LLIN	30.5	40.7	39,0	76.7	-27.5**	-23.5*
ANC 1+ (last pregnancy)	24.6	31.9	38.2	48.4	-3.0	7.1
ANC 4+ (last pregnancy)	17.0	21.9	26.1	37.6	-6.6	2.0
ANC in first trimester	25.5	24.6	20.5	16.4	3.2	0.4
Made a birth plan	30.3	32.9	34.7	58.3	-21.1*	-20.8*
Facility delivery	13.8	13.6	16.3	26.6	-10.5	-4.1
Newborn care						
Immediate breastfeeding	31.6	24.2	46.1	43.2	-4.4	-1.4
Placing baby on stomach immediately after birth	32.9	12.0	21.5	33.7	-33.2***	-27.8***
Use chlorhexidine to cleanse umbilical cord	15.9	15.4	18.1	27.4	-9.8	-4.9
Use misoprostol to stop bleeding	12.6	13.1	20.3	30.3	-9.6	-4.6
Child illnesses						
All child vaccinations	3.0	2.7	5.9	10.3	-4.7	-4.5
Exclusive Breastfeeding	29.3	11.0	45.9	37.4	-9.8	-7.0
Pct of under twos sleeping under LLIN	37.1	39.8	38.4	78.5	-35.7***	-37.1***
Under twos sleeping under an LLIN in households with at least 1 LLIN	46.6	66.3	53.9	89.1	-15.4*	-18.0**
Diarrhea						
Formal care	35.9	33.8	30.0	27.3	0.6	0.4
Child given ORS	27.2	36.9	56.0	42.7	23.1*	24.3*
Child given ORS/zinc	11.8	22.9	27.2	23.2	15.0*	16.0*
Acute Respiratory Infection						
Formal care for ARI	42.1	49.6	28.1	32.2	3.4	3.5
Antibiotic for ARI	25.6	38.0	52.6	28.3	36.7*	34.6**
Fever						
Formal care for fever	34.3	40.0	35.3	31.7	9.2	10.6
Rapid diagnostic test	16.8	25.2	24.0	29.7	2.6	0.4
ACT given for fever	17.9	27.0	36.1	34.8	10.4	7.6
Treatment sought same day or next?	64.5	60.8	70.9	69.8	-2.6	-1.1

Difference-in-differences models were estimated using linear regression with state-level fixed effects (e.g., Kebbi, Sokoto) interacted with a dummy variable for endline wave. Regressions were run separately for Kebbi v. Zamfara and Sokoto v. Zamfara. Differences in sample sizes for different regression models mean that similar DID effect sizes may differ in statistical significance. In adjusted models, control variables include Mother's education, age, household wealth. *** p <.001, **p<.01, * p<.05

Chapter 3. Trends for Socioeconomic Groups

Key finding: Wealth

To determine if changes were experienced to the same extent across different socioeconomic groups, we examined changes in key indicators by state and by wealth quintile.h Overall, improvements in indicators were evident across all wealth groups, and there was little evidence that the poorest households fared any better or any worse than less poor households (Tables 3.1–3.5).

In Kebbi, there were positive improvements in most indicators for the lowest wealth quintile, representing potentially the most vulnerable households. Modern contraceptive use increased by 13 pp (versus 7 pp for all women in Kebbi), while IPTp, 4+ ANC, and facility delivery increased by 15 pp, 7 pp, and 5 pp respectively. The only decline amongst the poorest women was with exclusive breastfeeding, which declined by 2 pp, slightly less than the average decline for all women in Kebbi (4 pp). In Zamfara, there were modest improvements among the poorest households for 4+ ANC visits (3.7 pp) and facility delivery (1.8 pp) but declines for modern contraceptive use (-0.7 pp) and IPTp (-2.1 pp). Exclusive breastfeeding by women in the poorest quintile increased substantially by 14.8 pp (from 9.2% to 24.0%), considerably better than the decline of 8.5 pp across all women in Zamfara. Sokoto showed a similar pattern to Zamfara. There were improvements in ANC4+ visits (4.4 pp) and facility delivery (5.7 pp) among women in the lowest quintile but declines in modern contraceptive use (-6.4 pp) and IPTp (-4.0 pp).

[h]Indicators for subsets of the sample, such as child immunizations or treatment seeking for ill children, are omitted here because small sample sizes (<10) within wealth quintiles prevent meaningful comparisons.

TABLE 3.1.1 MODERN CONTRACEPTIVE USE, BY WEALTH QUINTILE

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE %	ENDLINE %	CHANGE PP	BASELINE %	ENDLINE %	CHANGE PP	BASELINE %	ENDLINE %	CHANGE PP
Lowest	2.3	15.2	12.9	8.8	2.4	-6.4	7.0	6.3	-0.7
2nd lowest	8.2	12.0	3.8	7.4	10.2	2.8	4.0	9.1	5.1
Middle	5.2	9.9	4.7	10.1	13.9	3.8	5.2	8.4	3.2
2nd highest	22.5	16.5	-6.0	13.6	8.7	-4.9	18.0	15.8	-2.2
Highest	17.3	31.5	14.2	27.4	19.2	-8.2	34.6	33.4	-1.2
Total	9.0	15.6	6.6	11.3	9.4	-1.9	15.5	19.3	3.8
N	799	1,049		930	976		946	931	

TABLE 3.1.2 INTERMITTENT PREVENTIVE TREATMENT AGAINST MALARIA, BY WEALTH QUINTILE

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE
	%	%	PP	%	%	PP	%	%	PP
Lowest	8.4	22.9	14.5	11.6	7.6	-4.0	11.8	9.7	-2.1
2nd lowest	29.0	28.6	-0.4	10.2	14.6	4.4	11.6	11.6	0.0
Middle	27.6	34.8	7.2	11.7	14.0	2.3	14.5	19.1	4.6
2nd highest	34.8	36.6	1.8	23.5	24.2	0.7	17.5	20.1	2.6
Highest	33.3	52.4	19.1	32.0	23.4	-8.6	33.8	28.2	-5.6
Total	23.7	33.3	9.6	14.9	14.8	-0.1	19.1	21.3	2.2
N	892	1,045		1,078	967		1,069	929	

TABLE 3.1.3 OR MORE ANC VISITS, BY WEALTH QUINTILE

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE
	%	%	PP	%	%	PP	%	%	PP
Lowest	12.1	19.5	7.4	6.2	10.6	4.4	5.9	9.6	3.7
2nd lowest	23.5	24.0	0.5	10.5	16.2	5.7	12.7	17.7	5.0
Middle	19.8	29.5	9.7	23.6	22.0	-1.6	13.9	26.8	12.9
2nd highest	38.2	43.6	5.4	26.2	33.7	7.5	25.7	35.8	10.1
Highest	39.1	56.1	17.0	45.0	48.3	3.3	56.8	56.8	0.0
Total	23.6	32.0	8.4	17.0	21.9	4.9	26.1	37.7	11.6
N	887	1,044		1,069	967		1,069	929	

TABLE 3.1.4 FACILITY DELIVERY, BY WEALTH QUINTILE

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE
	%	%	PP	%	%	PP	%	%	PP
Lowest	5.7	10.3	4.6	5.3	11.0	5.7	3.5	5.3	1.8
2nd lowest	11.0	22.6	11.6	11.8	12.4	0.6	5.5	11.7	6.2
Middle	13.1	19.2	6.1	14.8	16.0	1.2	9.1	14.1	5.0
2nd highest	28.1	25.0	-3.1	15.6	9.2	-6.4	10.8	24.2	13.4
Highest	29.5	50.1	20.6	42.1	23.8	-18.3	42.5	44.3	1.8
Total	14.8	22.7	7.9	13.8	13.6	-0.2	16.3	26.6	10.3
N	892	1,044		1,078	964		1,069	1,011	

TABLE 3.1.5 EXCLUSIVE BREASTFEEDING, BY WEALTH QUINTILE

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE
	%	%	PP	%	%	PP	%	%	PP
Lowest	14.6	11.9	-2.7	27.4	11.9	-15.5	9.2	24.0	14.8
2nd lowest	20.9	11.5	-9.4	35.3	13.3	-22.0	43.6	19.3	-24.3
Middle	27.9	21.0	-6.9	30.9	3.7	-27.2	41.1	41.8	0.7
2nd highest	17.6	17.9	0.3	22.6	9.9	-12.7	53.0	42.4	-10.6
Highest	23.3	26.3	3.0	28.0	24.2	-3.8	60.9	41.5	-19.4
Total	20.3	16.6	-3.7	29.3	11.0	-18.3	45.9	37.4	-8.5
N	212	216		276	213		233	207	

Key finding: Education

We also compared trends in indicators by levels of mother's education to determine if changes were experienced to the same extent across each of these groups (Table 3.2). Generally, the data suggests that women with primary education in Kebbi experienced the most significant overall improvements across the studied indicators, while women with secondary+ education in Sokoto saw the greatest declines. However, the outcomes for women with Islamic education and no education showed mixed results, with both groups exhibiting smaller improvements or larger decreases compared to women with primary or secondary+ education in most instances.

1. No education: This group showed overall improvements in Kebbi, albeit of only a few percentage points, across almost all indicators except exclusive breastfeeding. For example, modern contraceptive use increased by 2 pp from 6% to 8%, IPTp 3+ increased by 3 pp from 21% to 24%, and facility deliveries increased by 4 pp from 9% to 13%. In Sokoto, there were declines in all indicators except for ANC4+, which remained almost unchanged, and in Zamfara, there were improvements in all indicators except contraceptive prevalence rate and exclusive breastfeeding.
2. Primary education: In Kebbi, this group improved the most of any education group in contraceptive prevalence rate (by 20 pp from 13% to 33%) and even for exclusive breastfeeding (by 38 pp from 15% to 53%) but showed declines in all indicators in Sokoto except for 4+ ANC visits. In terms of IPTp. For delivery in a health facility, it improved in Kebbi and Zamfara, but decreased in Sokoto. Exclusive breastfeeding improved significantly in Kebbi but decreased in Sokoto and Zamfara.
3. Secondary+education: This group improved in almost all indicators in Kebbi, except exclusive breastfeeding which declined from 43% to 28%. In Sokoto, this group declined across all indicators except 4+ ANC visits. In Zamfara, it declined in contraceptive prevalence rate, IPTp and exclusive breastfeeding but improved slightly in 4+ ANC visits and facility deliveries.
4. Islamic education: In Kebbi, Sokoto, and Zamfara, this group had mixed results. In Kebbi, it had minor increases in contraceptive prevalence rate and 4+ ANC visits but declines in IPTp, delivery in a health facility, and exclusive breastfeeding. In Sokoto, it saw decreases in all indicators except 4+ ANC visits. In Zamfara, it increased in 4+ ANC visits and exclusive breastfeeding but declined in the rest.

When comparing changes for women with Islamic education to those with no education, it seems that, in general, women with Islamic education experienced smaller positive changes or larger negative changes in the indicators compared to women with no education.

It is important to keep in mind that these conclusions depend on the specific state and health indicator under consideration and are subject to the influence of various unaccounted-for factors. They are also highly variant due to the small numbers of women with primary and secondary levels of education relative to the other two educational categories.

TABLE 3.2 TRENDS IN INDICATORS, BY WOMEN'S EDUCATION LEVELS

	KEBBI			SOKOTO			ZAMFARA		
EDUCATION LEVEL	BASELINE %	ENDLINE %	CHANGE PP	BASELINE %	ENDLINE %	CHANGE PP	BASELINE %	ENDLINE %	CHANGE PP
Modern contraceptive use									
None	6.3	8.4	2.1	8.9	8.1	-0.8	9.6	9.3	-0.3
Primary	12.6	32.9	20.3	24.3	17.1	-7.2	30.7	21.8	-8.9
Secondary+	28.1	41.4	13.3	37.3	34.7	-2.6	44.1	40.0	-4.1
Islamic	9.8	11.8	2.0	14.4	7.5	-6.9	11.7	11.3	-0.4
Total	9.0	15.6	6.6	11.3	9.4	-1.9	15.5	19.3	3.8
N	799	1,049		930	976		946	931	
IPTp									
None	21.7	24.3	2.6	11.7	8.5	-3.2	14.0	23.5	9.5
Primary	35.1	50.1	15.0	37.1	25.8	-11.3	25.2	24.1	-1.1
Secondary+	28.9	59.8	30.9	54.5	33.1	-21.4	43.4	33.9	-9.5
Islamic	39.4	32.6	-6.8	18.2	16.1	-2.1	20.3	11.9	-8.4
Total	23.7	33.3	9.6	14.9	14.8	-0.1	19.1	21.3	2.2
N	892	1,045		1,078	967		1,069	929	
ANC 4+									
None	17.7	20.2	2.5	14.8	14.9	0.1	17.6	32.2	14.6
Primary	43.6	52.9	9.3	40.8	54.4	13.6	53.6	38.4	-15.2
Secondary+	53.2	62.7	9.5	63.0	69.1	6.1	67.7	70.2	2.5
Islamic	30.5	32.6	2.1	9.8	19.3	9.5	15.8	20.6	4.8
Total	23.6	32.0	8.4	17.0	21.9	4.9	26.1	37.7	11.6
N	892	1,088		1,078	1,045		1,069	1,011	
Facility delivery									
None	8.8	12.5	3.7	10.3	8.4	-1.9	9.0	18.7	9.7
Primary	36.9	40.4	3.5	26.9	17.7	-9.2	18.8	26.0	7.2
Secondary+	40.5	61.7	21.2	68.1	42.4	-25.7	54.4	55.5	1.1
Islamic	24.8	18.2	-6.6	15.5	13.4	-2.1	15.4	13.3	-2.1
Total	14.8	22.7	7.9	13.8	13.6	-0.2	16.3	26.6	10.3
N	892	1,044		1,078	964		1,069	1,011	
Exclusive breastfeeding									
None	17.1	9.9	-7.2	26.3	8.8	-17.5	44.4	34.6	-9.8
Primary	15.4	53.4	38.0	30.4	19.2	-11.2	56.3	42.8	-13.5
Secondary+	43.4	28.1	-15.3	46.2	24.5	-21.7	62.8	51.9	-10.9
Islamic	21.2	17.8	-3.4	60.8	10.5	-50.3	24.2	29.1	4.9
Total	20.3	16.6	-3.7	29.3	11.0	-18.3	45.9	37.4	-8.5
N	212	216		276	213		233	207	

Chapter 4. Malaria

Key findings

The key behaviors targeted by Breakthrough ACTION/ Nigeria for malaria are ITN use and care by vulnerable groups (pregnant women and under twos), IPTp with at least three or more doses of sulfadoxine-pyrimethamine (SP)/Fansidar, malaria testing for children with fever, prompt treatment of positive malaria cases with ACT, children's receipt and completion of seasonal malaria chemoprophylaxis provided by community health workers. Malaria SBC in Kebbi and Sokoto was just one component of their integrated messaging while the SBC in Zamfara was solely focused on malaria.

Malaria prevention: As noted in previous sections, ownership of LLINs decreased considerably in Kebbi (from 78% of households at baseline to 46% at endline) and Sokoto (from 80% at baseline to 61% at endline), while ownership grew to nearly nine out of ten households in Zamfara (from 74% at baseline to 88% at endline) (Table 4.1.1). This finding is consistent with the timing of mass net distributions.[i] The percentage of households with at least one LLIN for every two household members fell from 26% to 8% in Kebbi and from 21% to 10% in Sokoto. Even though household net ownership (of at least one LLIN) increased by 14 pp in Zamfara, the percentage of households with at least one LLIN for every two household members increased only slightly, from 15% at baseline to 17% at endline.

LLIN use among households with at least one LLIN increased in all states for both under 2s and pregnant women. In Zamfara among households with at least one LLIN, the percentage of pregnant women sleeping under an LLIN increased from 39% at baseline to 77% at endline, while the percentage of children under the age of 2 sleeping under an LLIN increased from 54% to 81%. Increases, albeit of smaller magnitude, were also apparent in the integrated states. In Kebbi, the percentage of pregnant women sleeping under an LLIN in households with at least one LLIN increased from 29% at baseline to 51% at endline, while the percentage of children under the age of 2 sleeping under an LLIN increased from 38% to 68%. Overall use among the entire population in households with at least one LLIN increased from 32% to 46%, with increases evident among all age groups (Figure 4.1.1). Similarly, in Sokoto, the percentage of pregnant women sleeping under an LLIN in households with at least one LLIN increased from 31% at baseline to 41% at endline, while the percentage of children under the age of 2 sleeping under an LLIN increased from 47% to 67%. Overall use among the entire population in Sokoto households with at least one LLIN increased from 34% to 46%, with increases evident among all age groups (Figure. 4.1.2). The corresponding figures for Zamfara were 39% at baseline and 71% at endline (Figure 4.1.3).

Malaria during pregnancy: The percentage of women who reported receiving the recommended three or more (3+) doses of SP/Fansidar—intermittent preventive treatment for malaria during pregnancy (IPTp) - increased by nearly 10 percentage points (pp) from baseline to endline in Kebbi (24% at baseline, 33% at endline) but changed minimally in the other two states—Sokoto (15% at baseline, 15% at endline) and Zamfara (19% at baseline, 21% at endline) (Table 4.2.1). In line with the baseline data, the majority of women in all three states received their first dose of intermittent preventive treatment in pregnancy (IPTp) during their second trimester (refer to Table 2.2.1). There was a 14-percentage point (pp) increase from baseline in Kebbi, a 4-pp increase in Zamfara, and no change in Sokoto. The timing of the first dose of SP/Fansidar correlated with the timing of the first ANC visit. For instance, in Kebbi, even among women who initiated ANC during their first trimester, 44% of those who received at least one dose of SP/Fansidar did so in their second trimester. In contrast, among women who had their first ANC visit in their second trimester and received at least one dose of SP/Fansidar, 85% received it during their second trimester (Figure 4.2.1). The three most common reasons cited for not taking IPTp were that it was not necessary because the pregnant woman was not sick, not attending ANC, and that it was "Up to God" (Table 4.2.2). In Kebbi, there was an increase in awareness from baseline to endline of all risks to the baby if the mother contracts malaria during pregnancy, including premature birth (26% at baseline, 44% at endline), low birth weight (13% at baseline, 27% at endline), and miscarriage (35% at baseline, 57% at endline) (Table 4.2.3). In Sokoto, awareness of risks declined, while the results for Zamfara were mixed. In multivariate modeling,

[i]Prior to this survey, mass distribution occurred in 2020 in Zamfara, but only in 2017 in Sokoto and in 2018 in Kebbi. In the latter case, net distribution was occurring just as data collection was being finalized.

awareness that malaria during pregnancy could lead to fetal death was positively associated with a 6-pp increase in the likelihood of receiving IPTp, from 18% to 24%.

Pediatric fever prevalence and treatment: Prompt and effective treatment of fevers in children is essential to prevent mortality and morbidity. Fever prevalence increased in all three states as compared with the baseline survey, which was conducted approximately one calendar month earlier in the rainy season (Table 4.3.1a, 2.3.1b). Malaria testing of children with fever was not widely prevalent. Across all three states, only a minority of children with fever were given a malaria test, although there was a substantial increase in testing in Sokoto (17% at baseline, 25% at endline) that was not matched in the other integrated state. In Kebbi, testing rates fell (23% at baseline, 15% at endline), while they increased in Zamfara (from 24% at baseline to 30% at endline). None of the estimated adjusted DIDs were statistically significant, however. The most common reason for not testing for malaria was that respondents felt the test was unnecessary (Kebbi: 52%, Sokoto: 36%, Zamfara: 23%) or that the test was not offered (Kebbi: 28%, Sokoto: 25%, Zamfara: 33%) (Table 4.3.3). A significant percentage of women felt that fever outcomes and treatment were "Up to God" (Kebbi: 19%, Sokoto: 13%, Zamfara: 11%).

Sokoto showed increases in several treatment behaviors, including increases in obtaining medicines for fever (74% at baseline, 91% at endline), treatment with ACT (18% at baseline, 27% at endline), seeking care (54% at baseline, 79% at endline). These latter results yielded DID estimates relative to Zamfara of 14.8 pp ($p<.01$), 7.6 pp (NS), and 22.8 pp ($p<.01$) respectively. However, prompt treatment within the first 24-48 hours showed no improvement in Sokoto, decreasing slightly from 65% to 61%. No information was collected on whether a child tested positive for malaria to determine if treatment with ACT was appropriate. Across all treatment seeking indicators, Zamfara showed no changes while Kebbi showed declines in every indicator with the exception of prompt treatment of fever within 24-48 hours, which increased from 62% to 81%, yielding an adjusted DID estimate of 22 pp (NS). There was also an improvement in completion of the full course of ACT in Kebbi, from 62% to 94%, as compared with an improvement from 79% to 95% in Zamfara, and a decline in Sokoto from 82% to 73%.

Across all three states, the most important reasons for choosing the source of care were trust in the provider, effective treatment, and availability of transport (Table 4.3.5). This result underscores the importance to mothers of convenient, trusted, and high-quality health care provision for effective treatment of their sick children. Reasons for not seeking care were that treatment was too expensive, that the fever was not severe enough, and fatalism ("Up to God") (Table 4.3.6).

Seasonal malaria chemoprevention (SMC): Information on awareness of seasonal malaria chemoprophylaxis was not collected during the baseline wave. At endline, most women were aware of medicine given to children during the rainy season to prevent malaria (Kebbi: 88%, Sokoto: 86%, Zamfara: 79%) (Table 4.4.1). Most households also reported that a CHW had visited their household during the rainy season to give out medication to the children (Kebbi: 86%, Sokoto: 71%, Zamfara: 64%). For both indicators, prevalence was higher in the integrated states than in the malaria-only state.

In all three states, most but not all visited children took all doses provided by the CHW, including 86% in Kebbi, 71% in Sokoto and 76% in Zamfara. For those that did not, the most common reasons given were that the child was unavailable during the visit (Kebbi: 51%, Sokoto: 19%, Zamfara: 34%), that the child was not sick (Kebbi: 15%, Sokoto: 17%, Zamfara: 11%), or that they forgot (Kebbi: 5%, Sokoto: 30%, Zamfara: 14%) (Table 2.4.2).

Again, most mothers (Kebbi: 92%, Sokoto: 82%, Zamfara: 89%) correctly perceived that malaria chemoprophylaxis for children during the rainy season is effective. Nonetheless, there were important misconceptions, with one-third to one-half believing that healthy children do not need medicine to prevent malaria (Kebbi: 34%, Sokoto: 45%, Zamfara: 39%), Further, 18% of mothers in Kebbi, 20% of mothers in Sokoto, and 13% of mothers in Zamfara believe that medicines to prevent malaria during the rainy season can harm children (Table 4.4.3).

Malaria ideations: In Kebbi, Sokoto, and Zamfara, an overwhelming majority of mothers display a strong understanding of the cause of malaria. Specifically, over 90% of them correctly identify mosquito bites as the primary mode of malaria transmission. Reporting of incorrect transmission mechanisms, while not the norm, did occur, including eating dirty food, drinking dirty water, getting wet in the rain, cold weather, and teething (Table 4.5.1). The vast majority of women know that sleeping under a mosquito net can help to prevent malaria in children (Table 4.5.2).

We looked at the adjusted DID models to ascertain whether ideational factors such as attitudes, norms, and beliefs improved more in the integrated states or more in the malaria-only state. When comparing Kebbi to Zamfara (Table 4.5.3), the adjusted DID estimates indicate Kebbi improved more than Zamfara in most of the attitudinal and behavior indicators related to malaria, suggesting that malaria SBC efforts may have been more effective there, although almost none of the adjusted DID estimates are statistically different from zero.

For example, in Kebbi, there was a more significant reduction in the perception that a child's fever is nearly always malaria, with an adjusted DID of 4.3 percentage points. Similarly, beliefs surrounding malaria prevention, like the necessity of children under five and pregnant women sleeping inside nets, increased more in Kebbi (with an adjusted DID of 4.9 and 3.6 percentage points respectively). Other beliefs, such as the seriousness of malaria for pregnant women and unborn children and the effectiveness of antimalarials for pregnant women, also showed greater improvement in Kebbi. This evidence extends to actions as well, with Kebbi seeing a larger increase in behaviors like seeking advice promptly for a child's fever, ensuring that children under five always sleep under nets, and completing a full course of malaria treatment.

With respect to Sokoto and Zamfara, the picture was more nuanced. While Sokoto improved more than Zamfara in several of the attitudinal and behavioral indicators, Zamfara also showed greater progress in some areas. Yet, the magnitude of improvement was generally larger in Sokoto for the areas it did better, indicating overall more effective interventions in Sokoto.

For instance, Sokoto saw a larger increase in the perception that a child's fever is nearly always malaria, the belief in the importance of children under five and pregnant women sleeping inside nets, and the conviction that a health provider is best when a child is sick. Sokoto also outperformed Zamfara in terms of the belief that health facilities usually have medicines and the likelihood to seek advice promptly for a child's fever or to ensure that children under five always sleep under nets.

Contrarily, Zamfara improved more in the understanding that malaria can only be confirmed by a blood test, and in the concern about the possibility of malaria despite a negative test. Zamfara also saw a greater increase in the belief that malaria is very serious for pregnant women and unborn children, as well as the belief in the effectiveness of antimalarials for pregnant women. These findings suggest that while progress has been made in both states, the impact of the interventions has varied, underscoring the need for tailored strategies moving forward.

4.1 Malaria prevention

TABLE 4.1.1. LLIN AVAILABILITY AND USE IN HOUSEHOLD

Percentage of households with at least one LLIN and use of nets, by baseline and endline rounds

INDICATOR	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
LLIN ownership						
Households with at least one LLIN	78.0	45.5	80.0	61.3	74.4	87.8
LLIN availability in household (at least one for every 2 household members)	26.0	8.1	21.3	10.2	14.8	16.8
N (households)	892	1,088	1,078	1,045	1,069	1,005
Pregnant women						
% pregnant women sleeping under an LLIN the previous night	22.7	27.0	24.0	26.4	30.5	70.1
N (pregnant women)	492	202	687	435	728	373
% pregnant women sleeping under an LLIN in HHs with at least one LLIN	28.6	51.4	30.5	40.7	39.0	76.7
N	368	98	529	280	543	272
% pregnant women sleeping under an LLIN the previous night in households with 1 LLIN for every 2 people	50.6	87.8	35.6	58.1	45.6	97.9
N	69	19	137	40	87	45
Children under 2 years						
% children under 2 years sleeping under an LLIN the previous night	31.0	30.6	37.1	39.8	40.1	78.5
N (children < 2 years)	813	1,118	929	1,030	1,042	952
% children under 2 years sleeping under an LLIN the previous night in HHs with at least one LLIN	38.4	67.8	46.6	66.3	53.9	89.1
N	648	529	732	615	788	845
% children under 2 years sleeping under an LLIN the previous night in households with 1 LLIN for every 2 people	35.2	78.0	31.5	71.2	46.8	92.0
N (children < 2 years)	194	80	134	95	131	165

FIGURE 4.1.1 SLEPT UNDER LLIN PREVIOUS NIGHT AMONG HOUSEHOLDS WITH AT LEAST ONE LLIN, KEBBI

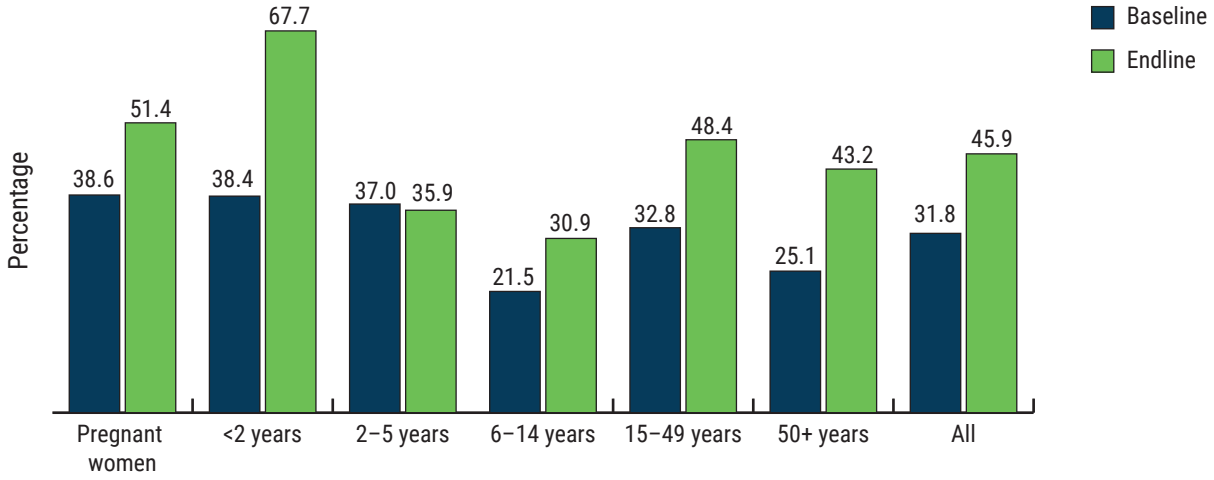


FIGURE 4.1.2 SLEPT UNDER LLIN PREVIOUS NIGHT AMONG HOUSEHOLDS WITH AT LEAST ONE LLIN, SOKOTO

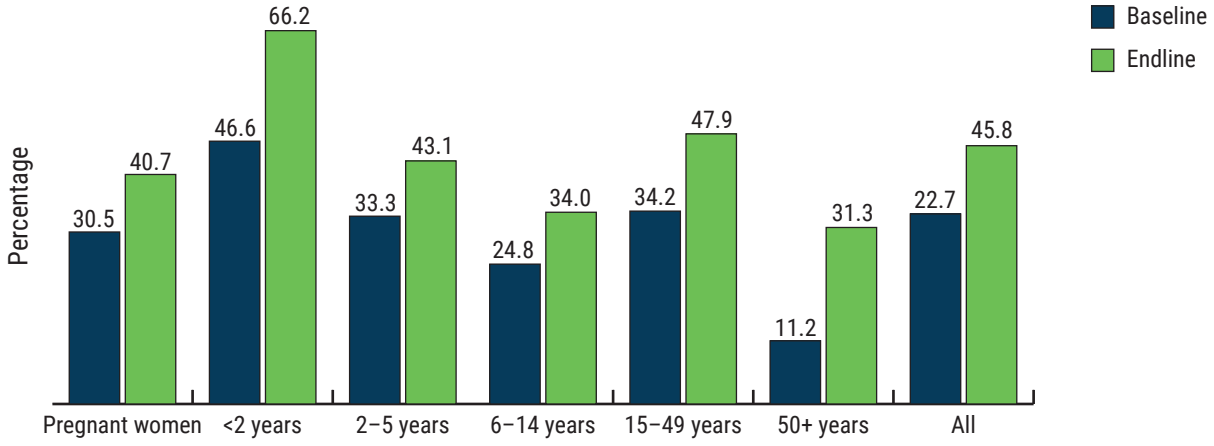
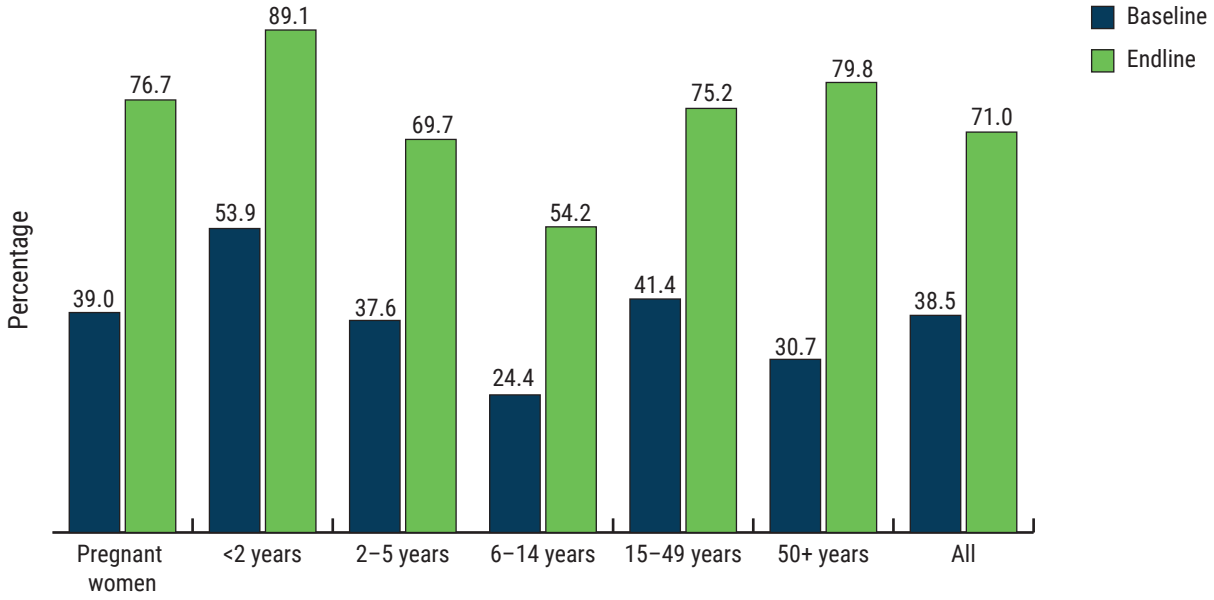


FIGURE 4.1.3 SLEPT UNDER LLIN PREVIOUS NIGHT AMONG HOUSEHOLDS WITH AT LEAST ONE LLIN, ZAMFARA



4.2 Malaria in pregnancy

TABLE 4.2.1. IPTP DURING LAST PREGNANCY

Number of doses of SP/Fansidar received and timing of doses during last pregnancy among women 15 to 49 years with a child under 2 years, by baseline and endline rounds

SOURCE	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Number of doses:						
Don't know	4.0	3.7	0.9	2.3	2.2	0.4
None	51.7	42.9	61.9	49.9	45.7	44.8
1	10.8	6.5	11.7	14.8	13.8	12.5
2	9.8	13.7	10.7	18.3	19.2	21.0
3+	23.7	33.3	14.9	14.8	19.1	21.3
N	892	1,045	1,078	967	1,069	929
Months pregnant when received first dose						
0–3 months	33.4	25.3	15.9	16.1	20.3	13.2
4–6 months	50.3	64.4	68.6	68.1	64.3	68.5
7–9 months	13.3	10.1	12.4	14.3	13.5	18.0
Don't know	0.3	0.2	3.1	1.5	1.9	3.6
N	435	608	460	491	603	522

FIGURE 4.2.1 TIMING OF FIRST DOSE OF SP/FANSIDAR BY TIMING OF FIRST ANC VISIT, ENDLINE ONLY

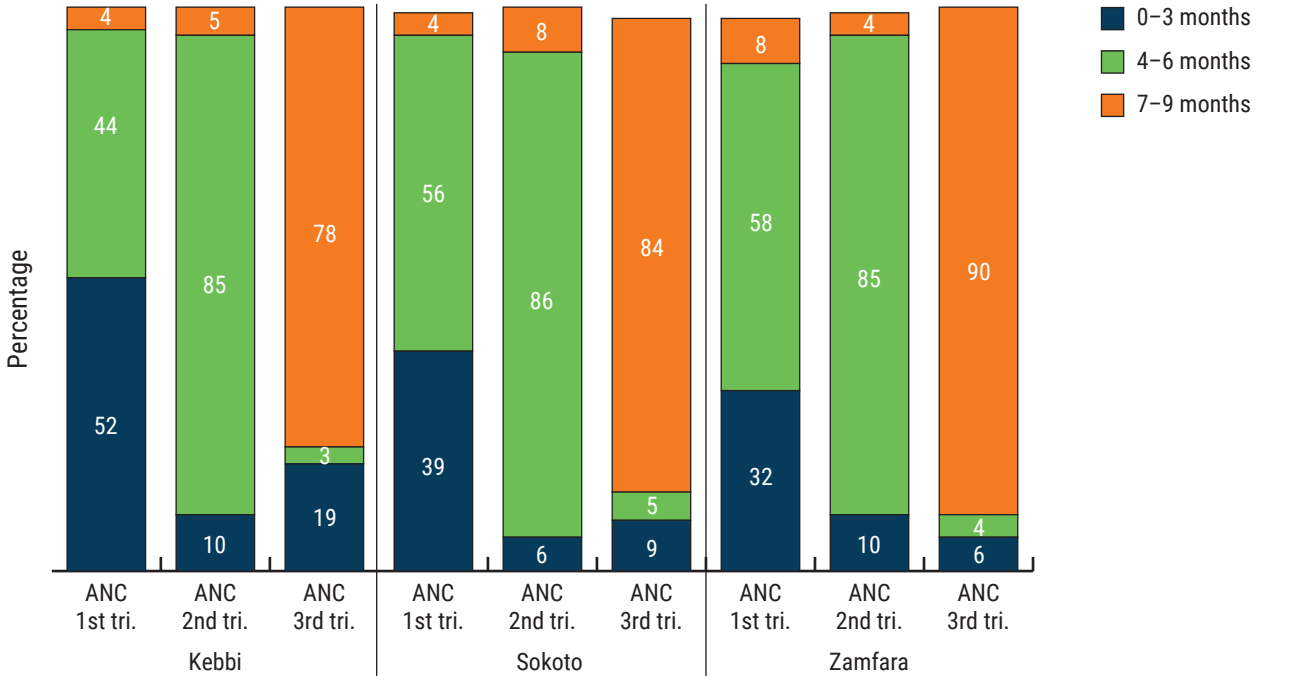


TABLE 4.2.2. REASONS FOR NO IPTP FOR MALARIA DURING LAST PREGNANCY

Percentage of women 15 to 49 years who did not receive IPTp for their last-born child in past two years by reason, by baseline and endline rounds

REASON	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Not available at facility	11.6	1.8	1.9	2.9	10.9	9.0
Provider did not offer	11.8	12.0	10.6	9.1	6.3	13.7
Fear side effects	7.2	3.1	3.4	1.5	3.2	1.7
Costs too much	9.5	1.8	4.1	4.7	4.7	0.6
Respondent opposes	16.9	7.8	28.6	8.3	29.4	6.8
Spouse opposes	20.1	16.5	12.0	6.2	27.9	9.9
Religious leader opposes	0.7	0.0	1.2	1.3	0.3	0.0
Not necessary	NA	40.6	NA	43.2	NA	28.6
No ANC attendance	NA	41.6	NA	49.2	NA	50.1
Up to God	NA	25.6	NA	10.7	NA	15.9
N	410	431	593	460	459	404

TABLE 4.2.3 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, by baseline and endline rounds

RISK	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Fetal death	41.3	50.9	31.3	13.9	53.7	61.0
Premature birth	25.7	44.1	18.3	14.2	28.5	55.1
Low birth weight	12.7	27.4	11.3	7.9	20.4	17.7
Miscarriage	35.0	57.8	35.4	28.1	51.1	45.0
N	892	1,088	1,078	1,045	1,069	1,011

4.3 Fever care and treatment

TABLE 4.3.1A. CARE AND TREATMENT FOR PEDIATRIC FEVERS

Percentage of last-born children under 2 years who had a fever in the past two weeks and care received for the fever, by baseline and endline rounds

VARIABLE	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Did the child have a fever in the last 2 weeks?	21.8	27.1	16.4	25.5	-3.7	-2.6
Was the child given a blood test for malaria?	22.8	15.0	24.0	29.7	-13.7	-11.5
Was the child given medicines?	93.6	91.1	81.4	82.7	-3.7	-4.5
Was the child given ACT?	28.8	24.0	36.1	34.8	-3.3	-1.3
Was treatment sought for the child's fever?†	80.9	76.9	72.8	74.8	-5.9	-7.2
Was treatment sought same day or next day?	61.7	81.0	70.9	69.8	20.4	21.9
When was treatment sought?						
Same day	20.3	32.3	23.9	8.9		
Next day	41.4	48.6	47.0	61.0		
2 days after	24.7	19.1	21.7	23.4		
3+ days after	13.6	0.0	7.4	6.8		
N	200	279	285	369		

***indicates p<0.001, ** indicates p<0.01 and * indicates p<.0.05

†Includes any of government hospital, government PHC, dispensary/health post, community health outreach post, nursing/maternity home, private hospital/clinic, patent and proprietary medicine vendor (PPMV), pharmacy/community pharmacy, chemist, drug shop

TABLE 4.3.1B. CARE AND TREATMENT FOR PEDIATRIC FEVERS

Percentage of last-born children under 2 years who had a fever in the past two weeks and care received for the fever, by baseline and endline rounds

VARIABLE	SOKOTO		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Did the child have fever in last two weeks?	27.5	36.3	16.4	25.5	-0.4	-1.9
Was the child given blood test for malaria?	16.8	25.0	24.0	29.7	2.5	0.4
Was the child given medicines?	74.1	91.0	81.4	82.7	15.5*	14.8 *
Was the child given ACT?	17.9	27.0	36.1	34.8	10.7	7.6
Was treatment sought for child's fever? †	53.6	79.4	72.8	74.8	23.8*	22.8*
Treatment sought same day or next?	64.5	60.8	70.9	69.8	-2.6	-1.1
When was treatment sought?						
Same day	28.2	14.3	23.9	8.9		
Next day	36.3	46.6	47.0	61.0		
2 days after	25.9	24.3	21.7	23.4		
3+ days after	9.6	14.9	7.4	6.8		
N	188	250	285	369		

***indicates p<0.001, ** indicates p<0.01 and * indicates p<.0.05

†Includes any of government hospital, government PHC, dispensary/health post, community health outreach post, nursing/maternity home, private hospital/clinic, PPMV, pharmacy/community pharmacy, chemist, drug shop

TABLE 4.3.2. REASONS FOR TESTING THE FEBRILE CHILD FOR MALARIA

Percentage of last-born children under 2 years with fever in the past two weeks who were tested for malaria and reasons for getting the child tested, endline round

REASON	KEBBI %	SOKOTO %	ZAMFARA %
To confirm malaria	78.7	57.0	77.3
Trusted provider	51.5	12.6	19.9
Provider offered	35.5	28.0	12.4
Test was available	20.8	3.4	1.2
Free/Inexpensive	5.6	1.0	1.5
Transport available	2.1	0.7	0.0
Short wait time	8.7	2.0	5.7
Husband recommended	12.8	4.1	3.2
Other recommended	1.1	0.0	1.0
Concern for worsening	8.3	6.4	3.6
N	43	81	76

TABLE 4.3.3. REASONS FOR NOT TESTING THE FEBRILE CHILD FOR MALARIA

Percentage of last-born children under 2 years with fever in the past two weeks who were not tested for malaria and reasons for not getting the child tested, endline round

REASON	KEBBI %	SOKOTO %	ZAMFARA %
Test not offered	28.0	24.8	33.4
Not necessary	51.5	36.4	22.5
Not customary	2.8	4.9	3.8
No permission	3.4	7.1	3.9
Don't trust tests	1.1	0.0	0.0
Up to God	18.5	12.8	10.6
Symptoms not severe	20.2	10.5	15.5
Child too young	5.7	7.5	4.8
Costs too much	2.8	3.3	3.0
Don't know where	0.9	0.0	0.9
Facility distance	4.3	0.8	2.4
Facility closed	0.0	2.8	2.0
Testing not available	2.2	1.2	0.4
N	237	279	176

TABLE 4.3.4. CARE-SEEKING FOR PEDIATRIC FEVERS

Percentage of last-born children under 2 years with fever in the past two weeks who sought any advice or treatment by source of care, by baseline and endline rounds

SOURCE	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Sought treatment	83.8	77.4	58.5	81.6	74.4	74.9
Type of care						
No care	16.2	22.7	41.5	18.5	25.9	25.1
Informal care	25.2	50.1	24.2	42.1	38.8	43.2
Formal care	58.6	27.2	34.3	39.3	35.3	31.7
Source of care						
Government hospital	31.2	11.5	6.0	5.6	15.3	11.8
Government PHC	17.7	12.7	19.0	24.4	15.6	14.6
Dispensary/health post	1.7	0.9	5.3	8.4	3.1	2.5
Community health outreach	6.1	1.0	0.2	0.0	0.0	2.5
Maternity home	0.0	0.7	0.0	0.0	0.0	0.6
Private hospital/clinic	1.5	0.3	4.0	1.0	0.9	0.0
Pharmacy/chemist/drug shop	24.4	50.7	19.9	40.8	40.5	43.5
N	200	279	285	369	188	250

Note that the respondent was not prompted about the type of facility attended. The interviewer is trained to code any secondary level government (or general) hospital mentioned as “government hospital.”

TABLE 4.3.5. REASONS FOR CHOOSING SOURCE OF CARE FOR PEDIATRIC FEVERS

Percentage of last-born children under 2 years with fever in the past two weeks taken to any source of care by reason for choosing treatment location, by baseline and endline rounds

REASON	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Free or inexpensive care	8.3	5.6	17.8	3.9	7.5	10.9
Transport available	38.6	50.8	37.7	37.4	28.9	35.4
Medicines often in stock	7.7	16.4	13.1	4.3	5.7	3.2
Respectful care	6.1	12.2	11.5	12.6	16.6	24.5
Trust to care for child	36.4	50.0	26.1	30.9	40.4	38.4
Effective treatment	19.7	46.9	25.0	33.1	31.9	33.0
Short wait time	8.0	20.6	8.6	23.7	14.0	17.8
Privacy	0.3	2.0	1.1	0.5	1.6	1.9
Family/friends recommend	9.9	21.3	11.9	9.5	19.1	14.0
Religious/community leaders	15.0	0.5	0.0	0.0	0.0	0.0
N	167	218	174	304	145	194

TABLE 4.3.6. REASONS FOR NOT SEEKING CARE FOR PEDIATRIC FEVERS

Percentage of last-born children under 2 years with fever in the past two weeks not taken to any source of care by reasons for no care-seeking, by baseline and endline rounds

REASON	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Too expensive/not enough money	15.6	43.6	31.0	34.0	39.6	11.5
Facility closed	10.3	3.5	0.0	0.0	0.0	9.9
Distance/no transportation	0.0	3.0	7.2	0.0	3.2	8.5
Medicine often not available	5.6	0.0	1.6	5.8	0.0	2.1
Poor quality service	0.0	0.0	0.0	3.0	0.0	0.0
Not severe/provided home care	22.9	45.6	27.3	30.9	16.9	36.1
Husband/partner oppose	0.0	6.8	10.2	14.4	10.0	11.6
Unable to leave work/home	0.0	4.1	1.4	0.0	0.0	3.4
Up to God	0.0	45.5	35.7	14.3	41.1	32.4
N	10	27	73	35	26	39

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

TABLE 4.3.7. ANTI-MALARIAL TREATMENT FOR PEDIATRIC FEVERS

Percentage of last-born children under 2 years with fever in the past two weeks given antimalarials by type, by baseline and endline rounds

SOURCE	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%		%	%
Any medicine taken?	93.6	91.1	74.1	91.1	81.4	82.7
Took ACT?	28.8	24.0	17.9	27.0	36.1	34.8
Child finished ACT?	62.2	93.5	81.8	72.5	79.0	95.2
Other medicines taken:						
SP/Fansidar	16.5	15.8	3.6	2.8	11.7	4.2
Chloroquine	20.9	10.3	8.2	7.9	6.9	5.7
Amodiaquine	4.7	4.1	2.9	3.3	0.8	0.0
Quinine pills	1.6	2.5	0.0	1.4	3.2	0.5
Quinine injection	6.3	4.5	1.8	4.3	1.7	3.4
Artesunate rectal	0.7	6.7	1.6	0.5	6.1	1.9
Other antimalarial	3.6	4.4	2.6	9.9	4.6	2.2
Antibiotic: pill/syrup	12.2	28.8	10.8	17.0	17.3	19.5
Antibiotic: injection	3.1	6.9	2.9	3.0	7.1	5.2
Aspirin	3.3	6.1	7.1	2.4	4.3	1.6
Acetaminophen	1.3	12.7	5.2	1.5	1.7	5.6
Ibuprofen	4.6	11.9	10.3	13.8	18.1	13.2
ORS	0.0	2.3	1.0	0.9	2.0	2.1
Zinc	0.3	3.5	0.7	0.3	2.0	0.9
Herbal remedy	8.6	5.4	4.6	6.4	5.4	2.9
N	200	279	285	369	188	250

4.4 Seasonal malaria chemoprevention

TABLE 4.4.1. SMC AWARENESS AND UPTAKE

Percentage of last-born children under 2 years who have heard of and were given medicine to prevent malaria in the past six months, endline

	KEBBI ENDLINE	SOKOTO ENDLINE	ZAMFARA ENDLINE
	%	%	%
Heard of medicine given to children to prevent malaria rather than to treat malaria?	87.7	86.3	79.0
During the past rainy season, community health worker come to household to give out medication that prevents malaria?	86.3	71.3	64.3
N	1,083	1,032	986
Child took all the doses of medication that the community health worker provided?	86.2	71.4	76.3
N	917	724	642

TABLE 4.4.2. REASONS FOR NOT TAKING SMC MEDICINES TO PREVENT MALARIA

Percentage of last-born children under 2 years who did not take medicine to prevent malaria in the past six months by reasons for not taking medicines, endline

	KEBBI ENDLINE	SOKOTO ENDLINE	ZAMFARA ENDLINE
	%	%	%
Child unavailable during CHW visit	51.2	18.5	34.3
Child not sick	15.3	16.8	11.0
Forgot	4.9	29.6	14.3
Lost medication	4.8	9.8	11.4
No water/food for medicine	0.0	0.0	0.9
Difficulty crushing tablets	2.8	7.6	10.1
Fear side effects	4.6	8.8	6.2
Do not know enough about medicine	0.8	1.0	2.9
Don't trust distributor	0.0	0.9	3.4
N	124	219	137

Table 4.4.3. SMC awareness and uptake

Percentage of last-born children under 2 years who have heard of and were given medicine to prevent malaria in the past six months, endline

IDEATION	KEBBI ENDLINE	SOKOTO ENDLINE	ZAMFARA ENDLINE
	%	%	%
Medicine to prevent malaria during rainy season is effective	92.0	82.3	89.4
Healthy children do not need medicine to prevent malaria	33.9	44.5	38.6
Meds to prevent malaria in rainy season can harm children	18.2	19.7	12.7
If child takes medicine, seeking care for fever is not needed	27.2	35.0	32.2
N	1,083	1,032	986

4.5 Malaria ideations

TABLE 4.5.1. REPORTED CAUSES OF MALARIA IN CHILDREN

Percentage of women aged 15 to 49 years with a child under 2 years reporting the causes of malaria in children, by baseline and endline rounds

CAUSE	KEBBI		SOKOTO		ZAMFARA	
	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %
Mosquito bites	94.1	98.6	93.4	95.9	99.5	96.6
Eating dirty food	11.1	12.2	4.8	0.9	4.7	1.3
Unripe mangoes	1.3	1.4	1.3	0.1	0.2	0.1
Eating cold corn	0.8	1.7	0.5	0.4	1.9	0.1
Drinking dirty water	16.4	17.4	4.2	2.0	11.0	2.1
Dirty surroundings	25.0	26.3	6.0	8.4	20.7	26.4
Drinking beer	0.7	1.1	0.4	0.1	0.2	0.5
Getting wet in rain	7.3	10.9	4.0	4.1	2.9	3.3
Cold weather	7.8	16.1	6.4	7.4	7.9	12.8
Witchcraft	0.2	1.8	2.0	0.4	0.6	0.3
Teething	3.1	7.5	6.1	7.7	5.8	1.6
Indigestion	1.1	2.6	0.6	0.2	0.3	0.0
People sneezing	3.2	3.2	1.0	0.7	0.2	0.1
N	892	1,088	1,078	1,045	1,069	1,011

Table 4.5.2. Reported ways to prevent malaria in children

Percentage of women aged 15 to 49 years with a child under 2 years reporting ways to prevent malaria in children, by baseline and endline rounds

PREVENTION MECHANISM	KEBBI		SOKOTO		ZAMFARA	
	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %
Sleep under mosquito net	92.1	94.8	90.2	89.7	95.3	94.3
Avoid mosquito bites	57.9	77.3	49.1	42.9	60.0	61.7
Take preventive medicine	15.0	25.6	12.8	15.9	25.3	19.6
Spray house with insecticide	20.9	34.6	11.9	11.6	19.9	26.7
Cut grass around house	26.1	37.9	9.3	5.4	16.7	23.2
Fill puddles/stagnant water	11.9	13.9	3.0	1.9	6.0	5.4
Keep surroundings clean	22.8	28.2	8.7	6.8	20.9	24.9
Burn leaves	6.9	16.8	2.7	4.7	6.5	12.7
Don't drink dirty water	6.9	12.7	1.9	1.8	2.7	1.1
Don't eat bad food	4.1	9.0	1.5	0.4	0.8	0.4
Put screens on windows	0.9	6.8	1.2	0.7	3.2	13.4
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 4.5.3. MALARIA-RELATED BELIEFS AND ATTITUDES: KEBBI V ZAMFARA

Percentage of women aged 15 to 49 years with a child under 2 years reporting malaria beliefs, or self-efficacy, by baseline and endline rounds

IDEATIONAL STATEMENT	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %	DID PP	DID PP
Child's fever is nearly always malaria	88.3	68.8	85.5	63.2	2.8	4.3
Malaria can only be confirmed by blood test	74.6	80.2	79.3	87.8	-3.0	-0.2
I still worry it could be malaria if test is negative	66.0	57.4	61.8	57.7	-4.5	-3.3
Children under 5 should always sleep inside net	90.4	95.1	97.2	97.2	4.7	4.9
Pregnant women should always sleep inside net	90.8	95.2	97.2	98.1	3.5	3.6
Very serious for mother and unborn child when a pregnant woman gets malaria	89.9	98.6	94.3	97.5	5.5	6.1
Antimalarials work well for pregnant women	89.1	95.5	91.8	95.3	2.9	4.2
Health provider is best when child is sick	88.6	96.5	91.8	97.7	2.1	3.4
Health facilities usually have medicines	65.8	73.5	74.3	89.4	-7.3	-2.1
Likely to …						
…seek advice same/next day for child's fever	90.8	96.7	96.0	98.0	3.9	4.5
…ensure that under 5s always sleep under net	91.4	93.9	97.0	96.1	3.4	3.5
…ensure that children take full malaria course	87.7	98.0	95.2	97.2	8.2	9.0*
Confident to convince husband to seek care	88.4	94.9	94.5	96.9	4.0	4.8
N	892	1,083	1,069	986		

*** p<.001, **p<.01, * p<.05

Table 4.5.4. Malaria-related beliefs and attitudes: Sokoto v Zamfara

Percentage of women aged 15 to 49 years with a child under 2 years reporting malaria beliefs, or self-efficacy, by baseline and endline rounds

IDEATIONAL STATEMENT	SOKOTO		ZAMFARA		UNADJUSTED DID	ADJUSTED DID
	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %	PP	PP
Child's fever is nearly always malaria	85.4	85.5	85.5	63.2	7.6	5.4
Malaria can only be confirmed by blood test	60.7	79.3	79.3	87.8	-5.3	-1.6
I still worry it could be malaria if test is negative	54.1	61.8	61.8	57.7	-0.2	-0.8
Children under 5 should always sleep inside net	84.6	97.2	97.2	97.2	6.0	6.5
Pregnant women should always sleep inside net	86.3	97.2	97.2	98.1	5.8	6.1
Very serious for mother and unborn child when a pregnant woman gets malaria	85.2	94.3	94.3	97.5	1.7	2.3
Antimalarials work well for pregnant women	84.8	91.8	91.8	95.3	-1.0	0.1
Health provider is best when child is sick	82.7	91.8	91.8	97.7	4.5	5.7
Health facilities usually have medicines	64.5	74.3	74.3	89.4	2.1	4.8
Likely to …						
…seek advice same/next day for child's fever	83.2	96.0	96.0	98.0	3.4	4.1
…ensure that under 5s always sleep under net	83.1	97.0	97.0	96.1	6.0	6.5
…ensure that children take full malaria course	85.6	95.2	95.2	97.2	1.1	1.9
Confident to convince husband to seek care	86.7	94.5	94.5	96.9	1.4	2.0
N	1,078	1,069	1,069	986		

*** p<.001, **p<.01, * p<.05

Chapter 5. Family planning

Key findings

Breakthrough ACTION/Nigeria targeted family planning indicators in Kebbi and Sokoto but not Zamfara, but there was a clear spillover of radio programming from Sokoto to Zamfara that covered many family planning issues. The key behaviors targeted by Breakthrough ACTION/Nigeria for family planning are use of modern contraception and post-partum use of modern contraception.

Contraceptive use: Modern contraceptive use increased in both Kebbi (9.0% at baseline, 15.6% at endline) and Zamfara (15.5% at baseline, 19.3% at endline) (Table 5.1.1). The adjusted DID estimate for Kebbi relative to Zamfara (2.8 pp) was not statistically significant. Modern contraceptive use declined slightly in Sokoto (11.3% at baseline, 9.4% at endline). This yielded a negative adjusted DID of 5.6 pp, but this too was not statistically significant. Upward trends in both Kebbi and Zamfara were driven largely by increased use of injectables (Zamfara: 8.3% at baseline, 9.4% at endline; Kebbi: 5.8% at baseline, 6.4% at endline) and implants (Zamfara: 3.9% at baseline, 5.6% at endline; Kebbi: 2.1% at baseline, 5.3% at endline). In Kebbi, the use of oral contraception also increased by 2.0 percentage points (1.2% at baseline, 3.2% at endline). Across all three states, changes in postpartum modern contraceptive use paralleled that for the full sample of women with a child under the age of two years (Table 5.1.1).

Contraceptive methods and access issues: Most women are aware of at least one method of modern contraception, and awareness has increased since the baseline survey in all states. Nearly all women in Zamfara (98%) are aware of at least one modern method, as compared with 89% in Kebbi and 85% in Sokoto (Table 5.1.2) The most commonly known methods are injectables (Kebbi: 85%, Sokoto: 83%, Zamfara: 97%) and implants (Kebbi: 82%, Sokoto: 70%, Zamfara: 95%). For each of these, there were slight increases in awareness from the baseline.

As in the baseline survey, most contraceptive users reportedly obtained their current method at a government hospital or government PHC (Table 5.1.3). At endline, only a small percentage of women reported difficulties in obtaining a method (Kebbi: 6%, Sokoto: 5%, Zamfara: 2%) (Table 5.1.4); reporting of difficulties in Sokoto fell by nearly two-thirds, from 13% at baseline to 5% at endline.

The rationale for using modern contraception among most users was principally for spacing ("to delay child-bearing") (Kebbi: 93%, Sokoto: 88%, Zamfara: 86%), but there were also notable increases in the percentage of women using contraception for limiting births: from 8% to 13% in Kebbi, from 5% to 16% in Sokoto, and from 11% to 16% in Zamfara (Table 5.2.1). Roughly a third of women using contraception cited their partner's desire to use contraception as a reason for use. The most common reason for not using contraception among current non-users was fatalism ("It's up to God") (Kebbi: 26%, Sokoto: 25%, Zamfara: 32%), although husband's opposition was also a common rationale (Table 5.2.2). This latter reason actually increased in importance in both Kebbi (14% at baseline, 25% at endline) and Sokoto (18% at baseline, 24% at endline), though it declined in Zamfara (24% at baseline, 15% at endline).

Intentions to start using contraception among non-users increased in Sokoto (8% at baseline, 13% at endline) and Zamfara (18% at baseline, 22% at endline) but declined in Kebbi (15% at baseline, 12% at endline) (Table 5.2.3). Across all three states, the vast majority of current users intended to continue using modern contraception (Kebbi: 84%, Sokoto: 86%, Zamfara: 90%).

Contraceptive beliefs, attitudes and myths: The picture regarding contraceptive beliefs, attitudes and myths is nuanced. Many indicators improved in the integrated states of Kebbi and Sokoto, but they also did so in Zamfara. In the area of injunctive norms, women's approval of contraception for birth spacing increased in Sokoto (36% at baseline, 44% at endline) but remained largely unchanged in Kebbi (48% at baseline, 46% at endline). The adjusted DID estimate for Sokoto relative to Zamfara (11.2 pp) was sizable but not statistically significant (Tables 5.3.3a, 5.3.3b). The adjusted DID of 2.2 pp for Kebbi relative to Zamfara was also not statistically significant.

The percentage of women who agreed that it is important for couples to discuss family planning increased

slightly in Sokoto (63% at baseline, 70% at endline) but by a larger amount in the malaria-only state of Zamfara (73% at baseline, 82% at endline). In Kebbi, there was no change. Women in all three states became more likely to agree that couples using family planning have a better quality of life but the increases in Zamfara outpaced those in the other two states (Kebbi: 65% at baseline and 72% at endline; Sokoto: 57% at baseline and 69% at endline; Zamfara: 60% at baseline and 75% at endline). Across all three states, there was little change in the percentage of women who agreed that people in the community would call them bad names if they were known to use contraception (Kebbi: 15% at baseline and 16% at endline; Sokoto: 34% at baseline and 35% at endline; Zamfara: 23% at baseline and 17% at endline).

In terms of contraceptive knowledge and myths, there were no clear patterns of greater improvements in the integrated states than in Zamfara. For example, the percentage of women who agreed that side effects are normal and usually go away increased in both Kebbi (52% at baseline, 68% at endline) and Sokoto (42% at baseline, 52% at endline) but by an even larger amount in Zamfara (52% at baseline, 68% at endline), thereby yielding negative but statistically insignificant adjusted DID estimates. In other cases, indicators worsened in the integrated states (e.g., "contraceptives can reduce a man's sexual urge," "contraceptives can reduce a woman's sexual urge") but worsened by an even larger amount in Zamfara. There were some positive findings in Kebbi relative to Zamfara, although none of them were statistically significant, including decreasing agreement that "contraceptives can give you deformed babies," "contraceptives can give women health problems," and "family planning can make women promiscuous."

The percentage who cited no benefits to the mother from using contraception fell slightly in all three states (Table 5.3.1). The most commonly cited benefits to mothers were "rest after birth" and "better health." There were large increases in reporting of specific benefits to the mother in Kebbi that were not evident in the other two states. The same was true for cited benefits to children (Table 5.3.2). The most commonly cited benefit of contraception for children was "better growth."

Spousal communication and decision-making: Rates of spousal communication about contraceptive use and family size were low and largely unchanged from the baseline (Table 5.3.5). At endline, only 5% of women in Kebbi, 6% of women in Sokoto, and 12% of women in Zamfara reported that they had ever had a discussion with their spouse about the number of children to have. Rates were higher for discussions of contraceptive use, but considerably more common at endline in Zamfara (33%) than in Kebbi (16%) and Sokoto (17%).

Decision-making patterns surrounding contraceptives showed some signs of change. In Kebbi, there was a slight increase in the percentage of women who said that they decide together with their husband but there was also a slight increase in the percentage who said that the husband mainly decides. Women in Sokoto also indicated a large increase in reporting that their husbands were the main deciders (26% at baseline, 39% at endline) (Table 5.3.6).

5.1 Contraception: current use, knowledge, and access issues

TABLE 5.1.1. CURRENT USE OF MODERN CONTRACEPTIVE METHODS

Percentage of non-pregnant women aged 15 to 49 years with a child under 2 years using any modern contraceptive method, by baseline and endline rounds

METHOD	ZAMFARA		KEBBI		SOKOTO		ADJUSTED DID KEBBI - ZAMFARA	ADJUSTED DID SOKOTO - ZAMFARA
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE		
	%	%	%	%	%	%	PP	PP
Any modern method	15.5	19.3	9.0	15.6	11.3	9.4	2.8	-5.6
Any modern method (postpartum only)	13.6	15.7	9.2	15.0	9.7	7.8	10.7	-9.8
Any method	17.5	21.8	9.9	17.5	12.3	11.6	3.3	-5.1
Female sterilization	0.1	0.1	-0.0	0.1	0.0	0.1	0.1	0.1
Male sterilization	0.1	-0.0	0.0	-0.0	0.0	-0.0	0.1	0.1
Intrauterine device	1.3	1.1	0.1	0.1	0.1	0.1	0.2	0.2
Injectables	8.3	9.4	5.8	6.4	5.5	3.8	-0.6	-2.7
Implants	3.9	5.6	2.1	5.3	4.3	3.9	1.5	-2.1
Daily pill	3.0	2.0	1.2	3.2	1.8	0.8	3.0*	0.0
Male condom	0.4	0.0	0.1	-0.0	0.0	-0.0	0.3	0.4
Emergency contraception	0.3	-0.0	-0.0	-0.0	0.0	0.1	0.3	0.4
Cycle beads	0.1	0.5	-0.0	0.0	0.2	0.0	-0.4	-0.6
Lactational amenorrhea method	0.7	0.2	0.1	0.0	0.0	0.2	0.5	0.7
Withdrawal	0.7	-0.0	0.2	-0.0	0.2	0.0	0.5	0.5
Traditional methods	0.0	2.2	-0.0	2.0	0.0	2.0	-0.2	-0.2
N	799	1,049	930	976	946	946		

*** indicates p<0.001, ** indicates p<0.01 and * indicates p<.0.05

TABLE 5.1.2. HAVE YOU EVER HEARD OF THE FOLLOWING CONTRACEPTION METHODS?

Percentage of women aged 15 to 49 years with a child under 2 years who have ever heard of contraceptive methods by type, by baseline and endline rounds

METHOD	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Any modern method	81.9	88.8	79.6	85.1	90.3	97.7
Female sterilization	31.7	36.8	19.8	12.8	27.4	59.6
Male sterilization	17.9	23.4	7.5	6.6	16.5	43.5
Intrauterine device	25.3	30.4	25.4	19.9	33.8	57.3
Injectables	72.3	85.4	74.4	82.8	86.4	97.1
Implants	65.3	82.4	63.3	70.1	78.1	94.8
Daily pill	71.6	83.4	67.2	75.3	82.9	88.2
Male condom	35.7	42.6	25.9	28.3	36.9	57.0
Female condom	14.3	27.5	12.5	13.0	16.6	40.5
Emergency contra.	13.7	21.3	13.3	18.8	15.5	38.6
Cycle beads	21.8	21.2	8.4	14.0	16.3	37.2
Lactational amenorrhea method	46.9	19.0	23.9	26.1	34.3	45.9
Rhythm method	25.4	14.5	5.8	7.8	12.3	29.5
Withdrawal	41.9	32.0	24.8	22.7	29.3	56.1
Spermicide	9.0	11.2	3.6	5.7	5.0	23.8
Diaphragm	8.5	11.4	3.9	4.5	5.2	23.4
Sayana press	12.7	22.4	7.4	12.7	6.7	28.8
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 5.1.3. WHERE DID YOU OBTAIN THE [CURRENT METHOD] THE LAST TIME?

Percentage of non-pregnant women aged 15 to 49 years with a child under 2 years using any contraception method by location obtained the last time, by baseline and endline rounds

LOCATION	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Don't know	0.0	0.0	0.0	0.0	1.3	0.4
Other (Specify)	1.2	0.0	12.8	1.5	13.7	0.0
Other private sector	5.8	0.0	0.0	0.0	1.3	0.0
Other public sector	0.0	0.0	0.4	0.0	0.0	0.0
Government hospital	34.6	43.7	33.8	21.2	46.9	50.2
Governmental PHC	42.1	29.9	28.1	37.6	21.6	23.3
Dispensary/health post	1.9	0.4	13.2	10.8	2.1	2.9
Community health outreach post	0.0	0.0	0.0	0.0	1.3	1.3
Nursing/maternity home	2.6	1.3	0.4	3.3	2.0	0.0
Private hospital/clinic	3.3	0.0	2.6	0.5	1.4	1.1
Pharmacy/chemist/drug shop	8.6	4.2	8.7	5.9	8.3	8.3
Traditional provider	NA	11.3	NA	18.4	NA	7.8
N	72	187	126	112	188	210

Note that the respondent was not prompted about the type of facility attended. The interviewer is trained to code any secondary level government (or general) hospital mentioned as "government hospital."

TABLE 5.1.4. DIFFICULTIES FACED OBTAINING [CURRENT METHOD] THE LAST TIME?

Percentage of non-pregnant women aged 15 to 49 years with a child under 2 years using any contraception method by difficulties faced in obtaining method last time, by baseline and endline rounds

LOCATION	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Any difficulties obtaining the method?	5.8	6.0	13.3	4.8	1.4	2.0
N	72	187	126	112	188	210

TABLE 5.1.5. CONTENT OF CONTRACEPTIVE DISCUSSIONS WITH HEALTH PROVIDER

Percentage of non-pregnant women aged 15 to 49 years with a child under 2 years using any contraception method by content of discussions with health provider, by baseline and endline round

LOCATION	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Asked about preferred method	74.3	82.1	82.1	70.4	76.1	87.1
Discussed how to use method	79.7	96.4	85.6	77.5	82.6	87.0
Discussed side effects	72.5	74.8	67.8	53.3	69.3	85.4
Discussed danger signs	59.3	70.9	65.9	58.0	66.8	82.9
Treated respectfully	83.7	93.1	87.3	70.7	86.5	88.6
Answered questions	75.1	76.0	83.3	58.4	81.4	86.7
N	72	187	126	112	188	210

5.2 Contraception: reasons for use/non-use and intentions

TABLE 5.2.1. REASONS FOR USING A CONTRACEPTIVE METHOD

Percentage of non-pregnant women aged 15 to 49 years with a child under 2 years using any contraception method by reasons for method use, by baseline and endline rounds

REASON	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Delay childbearing	82.1	93.4	79.5	88.1	77.9	85.8
Stop childbearing	7.8	12.7	4.5	15.8	11.3	15.5
Partner wants to use	24.7	30.9	37.9	30.1	29.7	35.2
Provider recommends	2.0	15.5	5.5	3.4	7.5	7.8
Protect against sexually transmitted infections	0.9	0.9	0.0	0.0	1.2	0.3
N	72	187	126	112	188	210

TABLE 5.2.2. REASONS FOR NOT USING A CONTRACEPTIVE METHOD

Percentage of non-pregnant women aged 15 to 49 years with a child under 2 years not using any contraception method by reasons for method non-use, by baseline and endline rounds

REASON	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Fear infertility	12.8	10.2	10.0	20.0	5.8	4.7
Infrequent sex	2.1	0.8	1.3	0.9	2.5	2.9
Can't get pregnant	4.2	15.0	1.0	3.6	6.2	4.5
Breastfeeding	17.2	16.2	12.0	14.2	31.3	19.4
Away from husband	1.1	3.0	2.7	3.0	2.6	2.9
Trying to get pregnant	1.4	20.7	3.3	11.1	1.4	8.9
Respondent opposes	13.6	11.0	15.8	17.2	20.3	12.8
Husbands opposes	14.2	25.0	17.6	24.3	24.3	14.6
Others oppose	0.5	0.0	0.5	1.1	0.3	0.1
Knows no method	4.7	6.2	1.1	2.5	0.8	0.8
Knows no place	1.5	1.2	0.9	0.5	0.7	1.5
Fear side effects	3.4	3.7	3.3	7.9	2.5	5.8
Facility distance	0.1	1.3	0.0	0.1	0.4	0.6
Transportation difficult	0.2	0.2	0.2	0.0	0.2	1.8
Costs too much	0.2	0.8	0.7	0.9	0.5	0.8
Inconvenient to use	2.5	1.1	3.1	3.0	1.5	8.5
Preferred method unavailable	0.1	0.1	0.0	0.0	0.1	0.4
Interferes with natural body processes	1.6	2.1	5.3	5.7	6.9	6.0
Up to God	23.8	26.3	33.6	25.1	20.1	31.8
N	727	862	804	864	758	736

TABLE 5.2.3. INTENTION TO USE/CONTINUE TO USE CONTRACEPTION IN THE NEXT 6 MONTHS

Percentage of women aged 15 to 49 years with a child under 2 years intending to start or continue to use contraception in next six months by method, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
METHOD	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Intention to start	15.4	11.6	8.3	12.9	17.7	21.6
N	727	861	804	864	758	734
Intention to continue	84.2	83.7	92.0	85.8	73.6	90.0
N	72	187	126	112	188	208

5.3 Contraception: beliefs, perceptions, and self-efficacy

TABLE 5.3.2. PERCEIVED CONTRACEPTION BENEFITS FOR MOTHERS

Percentage of women aged 15 to 49 years with a child under 2 years who report any contraceptive benefits for themselves by type of benefit, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
BENEFIT	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
No benefits	11.0	8.1	14.4	9.1	11.1	9.8
Rest after birth	62.2	76.5	62.4	66.8	70.9	78.3
Better health	29.4	45.9	22.6	21.9	43.3	44.4
Beauty and youth	14.5	35.0	15.5	14.0	32.8	35.3
Fewer complications	8.1	18.8	13.1	11.4	18.9	20.2
Fewer unwanted pregnancy	8.5	19.6	10.7	13.6	19.4	19.6
Fewer children to school	1.0	7.1	1.6	2.3	5.1	8.6
Family has more money	0.5	5.6	1.0	1.8	3.2	7.9
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 5.3.2. PERCEIVED CONTRACEPTION BENEFITS FOR FUTURE CHILDREN

Percentage of women 15 to 49 years with a child under 2 years reporting contraceptive benefits for future children by benefit, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
METHOD	BASELINE	ENDLINE	BASELINE	METHOD	BASELINE	ENDLINE
	%	%	%	%	%	%
Better nutrition	17.0	35.7	18.9	12.5	37.7	37.4
Better growth	59.2	73.9	54.0	65.7	64.4	73.2
Better nutrition	17.0	35.7	18.9	12.5	37.7	37.4
Better health	25.6	41.8	15.3	27.9	42.2	36.6
Better survival	5.3	23.0	9.2	8.3	20.2	20.5
More maternal attention	19,5	28.2	22.4	12.4	32.4	29.3
Better education	2.6	8.7	3.2	1.7	9.0	13.2
More opportunities	2.8	5.8	1.8	1.9	9.9	17.7
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 5.3.3A. CONTRACEPTION BELIEFS, ATTITUDES, AND PERCEIVED SOCIAL NORMS—KEBBI V ZAMFARA

Percentage of women aged 15 to 49 years with a child under 2 years reporting contraception beliefs, attitudes, or perceived social norms, by baseline and endline rounds

	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
IDEATION	BASELINE	ENDLINE	BASELINE	METHOD	DID	DID
	%	%	%	%	PP	PP
Approve of family planning for birth spacing	47.5	45.8	46.6	49.0	-4.1	2.2
It is important for couples to discuss family planning	72.3	72.8	73.1	81.8	-8.2	-5.5
Would be called bad names if use family planning	14.6	16.0	23.0	17.1	7.2	5.4
Couples using family planning have a better quality of life	64.7	72.1	59.7	74.9	-7.8	-2.4
Religious leaders should speak about family planning	53.2	76.8	50.2	64.8	9.1	12.7
Most couples in community use family planning	43.1	55.5	53.0	76.6	-11.2	-6.5
Side effects are normal and usually go away	52.4	68.0	51.7	68.2	-1.0	4.0
Contraceptives can make women infertile	28.8	22.3	26.4	20.6	-0.6	-1.5
Contraceptives can harm a woman's womb	30.2	23.2	25.7	22.3	-3.5	-2.9
Family planning can reduce a man's sexual urge	13.1	13.6	12.6	16.8	-3.6	-1.5
Family planning can reduce a woman's sexual urge	12.9	13.3	14.3	17.1	-2.5	-0.2
Contraceptives can cause cancer	16.1	13.8	16.3	18.0	-4.1	-2.8
Contraceptives can give you deformed babies	16.1	13.6	16.4	15.0	-1.1	0.2
Contraceptives can give women health problems	32.4	25.6	31.2	29.6	-5.3	-5.6
Family planning can make women promiscuous	14.1	12.2	11.3	17.8	-8.4	-7.7
Women's bodies are not ready for children until 18	27.2	35.3	28.8	40.6	-3.7	-0.4
Women over 35 have more pregnancy complications	35.8	47.6	44.0	59.9	-4.2	-1.9
N	892	1,088	1,045	1,069		

*** indicates p<0.001, ** indicates p<0.01 and * indicates p<.0.05.

TABLE 5.3.3B. CONTRACEPTION BELIEFS, ATTITUDES, AND PERCEIVED SOCIAL NORMS—SOKOTO V ZAMFARA

Percentage of women aged 15 to 49 years with a child under 2 years reporting contraception beliefs, attitudes, or perceived social norms, by baseline and endline rounds

IDEATION	SOKOTO		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	METHOD	DID	DID
	%	%	%	%	PP	PP
Approve of family planning for birth spacing	35.7	43.9	46.6	49.0	5.8	11.2
It is important for couples to discuss family planning	63.4	69.6	73.1	81.8	-2.5	1.0
Would be called bad names if use family planning	34.4	34.9	23.0	17.1	6.3	3.9
Couples using family planning have a better quality of life	56.5	68.9	59.7	74.9	-2.8	1.9
Religious leaders should speak about family planning	50.9	63.9	50.2	64.8	-1.5	2.0
Most couples in community use family planning	34.6	51.7	53.0	76.6	-6.6	-0.9
Side effects are normal and usually go away	42.0	52.4	51.7	68.2	-6.3	-2.6
Contraceptives can make women infertile	32.5	36.9	26.4	20.6	10.3	7.9
Contraceptives can harm a woman's womb	35.9	35.5	25.7	22.3	3.1	0.6
Family planning can reduce a man's sexual urge	19.9	21.2	12.6	16.8	-2.9	-5.1
Family planning can reduce a woman's sexual urge	20.1	20.9	14.3	17.1	-2.0	-4.1
Contraceptives can cause cancer	25.1	25.0	16.3	18.0	-1.9	-4.8
Contraceptives can give you deformed babies	24.1	23.2	16.4	15.0	0.5	-2.2
Contraceptives can give women health problems	36.9	47.5	31.2	29.6	12.2	9.0
Family planning can make women promiscuous	22.2	26.9	11.3	17.8	-1.8	-4.3
Women's bodies are not ready for children until 18	22.7	30.3	28.8	40.6	-4.3	-2.0
Women over 35 have more pregnancy complications	33.0	37.8	44.0	59.9	-11.1	-9.7
N	1,078	1,045	1,069	1,011		

*** indicates p<0.001, ** indicates p<0.01 and * indicates p<.0.05.

TABLE 5.3.5. SPOUSAL COMMUNICATION ABOUT CONTRACEPTION

Percentage of women aged 15 to 49 years with a child under 2 years reporting on spousal communication about contraception, by baseline and endline round

TOPIC	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Number of children	4.4	5.3	6.3	5.7	8.5	11.9
Discuss use of family planning	17.1	15.5	16.1	17.1	26.4	32.8
Total	892	1,088	1,078	1,045	1,069	1,011
Topic (Among those couples who discussed)						
Which method to use	44.7	74.1	51.5	50.6	57.7	78.6
Spacing	72.4	82.1	67.8	64.3	70.7	67.8
Limiting	5.3	26.5	5.0	18.6	18.5	13.6
Side effects	9.0	22.6	11.7	17.2	18.6	25.7
N	149	177	190	192	308	325

TABLE 5.3.6. WHOSE DECISION IS IT TO USE CONTRACEPTION?

Percentage of women aged 15 to 49 years with a child under 2 years reporting on who else influences a woman's decision about contraceptive use, by baseline and endline rounds

WHOSE DECISION IS IT TO USE CONTRACEPTION?	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Mainly my decision	23.5	16.1	17.7	17.0	27.1	25.5
Mainly partner	30.1	34.1	26.4	39.3	17.0	19.5
Decide together	46.4	49.6	56.0	41.6	55.8	52.6
Someone else	0.0	0.1	0.0	2.1	0.0	2.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	892	1,088	1,078	1,045	1,069	1,011

Chapter 6. Antenatal, delivery, and newborn care

6.1 Antenatal care

ANC attendance: Among women with a completed pregnancy in the past two years, the percentage who made the recommended 4 or more ANC (ANC4+) visits during their last pregnancy increased from 24% at baseline to 32% at the endline in Kebbi; and from 26% to 38% at baseline and endline respectively in Zamfara (Table 6.1a). In Sokoto, the percentage also increased, albeit by a smaller margin (17% at baseline, 22% at endline) (Table 6.1b). None of these DID estimates were statistically significant. Across all three states, more than nine out of ten women with a completed pregnancy in the past two years reported that they had wanted to get pregnant at that time (Table 6.1.1). Among those who had not wanted to get pregnant at the time that they did, most had wanted to wait longer, however among the others with mistimed pregnancies, 26% of women in Kebbi, 20% in Sokoto, and 30% in Zamfara had not wanted to have more children.

In Kebbi, there was an increase in the percentage of women who made their first ANC visit during their first trimester, rising from 31% at baseline to 36% at endline (Table 6.1.2). However, this percentage remained unchanged in Sokoto, with 26% at baseline and 25% at endline. In Zamfara, there was a slight decrease, with 21% at baseline and 16% at endline. It's important to note that this trend may be influenced by an increase in the overall number of women attending any ANC visits, which could include women who initiated ANC later but might not have sought care at all previously.

The vast majority of pregnant women who went for ANC attended either a government hospital or PHC, with slight increases in each of the three states (Kebbi: 87% at baseline and 92% at endline; Sokoto: 79% at baseline and 82% at endline; Zamfara: 88% at baseline and 90% at endline) (Table 6.1.2). In both Kebbi and Zamfara, there was increasing reliance on government hospitals (Kebbi: 32% at baseline and 48% at endline; Zamfara: 47% at baseline and 56% at endline). In Sokoto, the pattern was reversed (31% at baseline and 24% at endline).

ANC content: Among women who reported attending ANC, there were improvements from baseline to endline in the services they reported that they received during those ANC visits (Table 6.1.4). Over 90% of these women who reported that they had their blood pressure measured, and most reported that they had urine (Kebbi: 66% at baseline and 78% at endline; Sokoto: 67% at baseline and 77% at endline; Zamfara: 80% at baseline and 88% at endline) and blood samples taken (Kebbi: 72% at baseline and 91% at endline; Sokoto: 78% at baseline and 76% at endline; Zamfara: 82% at baseline and 92% at endline). The discussion of a child's due date with a provider also showed improvement, with increases in Kebbi (45% to 73%), Sokoto (40% to 52%), and Zamfara (54% to 84%). However, the distribution of mosquito nets during ANC visits decreased, from 26% to 8% in Kebbi, from 17% to 5% in Sokoto, and from 36% to 19% in Zamfara.

There were large improvements in the percentage of women taking iron supplements during their most recent pregnancy from baseline to endline (Kebbi: 49% at baseline and 83% at endline; Sokoto: 37% at baseline and 70% at endline; Zamfara: 53% at baseline and 76% at endline) (Table 6.1.5). Similarly, the prevalence of tetanus toxoid injections improved in all three states (Kebbi: 38% at baseline and 47% at endline; Sokoto: 32% at baseline and 42% at endline; Zamfara: 47% at baseline and 55% at endline), as did folic acid supplementation (Kebbi: 45% at baseline and 55% at endline; Sokoto: 38% at baseline and 44% at endline; Zamfara: 54% at baseline and 57% at endline).

Birth Planning: The development of a birth plan with the assistance of a healthcare provider does not seem to be a common practice in the study areas. The endline results indicate a continued need for more intensive SBC messaging to improve this practice in the future (Table 6.1.6). At endline, only Zamfara state had more than 50% of women reporting discussions of birth plans with a healthcare provider, which was a significant increase from 35% at baseline. Of the women who had discussions about birth planning, the healthcare provider most frequently talked about the delivery location.

ANC awareness and non-use reasons: Although attendance of 4+ ANC visits remained low, there was a notable increase in the percentage of women who were aware of the recommended number of ANC visits in all three states, with the largest increase occurring in Kebbi (29% at baseline, 51% at endline) but notable increases in the other two states as well (Sokoto: 36% at baseline, 45% at endline; Zamfara: 50% at baseline, 59% at endline (Table 6.1.7). Among women who chose not to make any ANC visits during their last pregnancy, the most common reasons were a lack of perceived need, spousal opposition, facility distance, and fatalism ("Up to God") (Table 6.1.8). The latter reason declined in importance in Sokoto (30% at baseline, 15% at endline) but not in Kebbi (10% at baseline, 24% at endline) nor Zamfara (19% at baseline and 19% endline) Other provider-side barriers, such as closed facility, mistrust of provider, poor treatment by provider, poor quality of service, or absence of a female provider, were generally cited by fewer than 2% of respondents in Kebbi and Sokoto, but by slightly more in Zamfara but still fewer than 5% of respondents.

ANC decision-making, self-efficacy, and intentions: Husbands play a clearly important role in the use of antenatal and other pregnancy-related care (Table 6.1.9). Nearly all women in Kebbi (94%) reported that their husband influences their decision to make 4 or more ANC visit. Most women In Sokoto (86%) and Zamfara (83%) also report that their husband is influential. Mothers-in law In Kebbi (16%) and Sokoto (12%) also play an influential role, as do mothers in Kebbi (12%). Approximately one in six women in Zamfara (16%) and one in nine women in Sokoto (12%) report that no one else influences their ANC decisions.

Women acknowledge the importance of discussing their pregnancies with their husbands, and this recognition increased in all three states over the study period (Kebbi: 91% at baseline and 95% at endline; Sokoto: 88% at baseline and 91% at endline; Zamfara: 95% at baseline and 97% at endline). Commendably, there were also improvements in women's confidence in initiating a conversation with their husband about ANC (Kebbi: 77% at baseline and 78% at endline; Sokoto: 65% at baseline and 75% at endline; Zamfara: 74% at baseline and 86% at endline). This confidence also appears to carry over to confidence about getting to a health facility, which also increased across all states (Kebbi: 68% at baseline and 74% at endline; Sokoto: 61% at baseline and 68% at endline; Zamfara: 71% at baseline and 81% at endline). Most women also believed that they would make 4+ ANC visits for the next pregnancy (Kebbi: 75%, Sokoto: 71%, Zamfara: 84%).

ANC benefits and myths: Common maternal benefits of ANC are to monitor the mother's health and the baby's growth, as reported by over 50% of respondents across the states (Table 6.1.11, 6.1.12). However, there are still common myths about ANC, and agreement with these myths actually increased in Sokoto and Zamfara states (6.1.12). Kebbi showed improvements, with a notable decline in the number of respondents agreeing with ANC-related myths at the endline. For instance, the percentage of women who agreed that only first-time pregnant mothers need ANC decreased from 44% to 38% in Kebbi, while it actually increased in Zamfara from 34% to 39%. In adjusted models, this yielded a DID of -17 pp. There was also greater agreement in Kebbi that the health facility is the best place to deliver a baby, with an adjusted DID of 12 pp, although this was not statistically significant. In Sokoto, however, the trends were in the other direction. The percentage of women who agreed at endline that "using a traditional provider is better than a health facility for ANC" increased from 39% to 44%, as compared with a small decrease from 30% to 28% in Zamfara.

TABLE 6.1A. ANTENATAL CARE VISITS AND DIFFERENCE-IN-DIFFERENCES ESTIMATES, KEBBI V. ZAMFARA

Percentage of women 15 to 49 years with a child under 2 years reporting 1+, 4+ and 8+ ANC visits during last pregnancy, by baseline and endline rounds

	KEBBI		ZAMFARA		DID	
	BASELINE	ENDLINE	BASELINE	ENDLINE	UNADJUSTED	ADJUSTED
	%	%	%	%	PP	PP
ANC 1+ (last pregnancy)	42.1	45.9	38.2	48.4	-6.5	0.1
ANC 4+ (last pregnancy)	23.6	32.1	26.1	37.6	-3.2	3.5
ANC 8+ (last pregnancy)	NA	7.9	NA	3.8		
ANC in first trimester	30.7	36.3	25.5	24.6	9.7	8.5
Made a birth plan	25.2	36.2	34.7	58.3	-9.5	-9.2
Facility delivery	14.8	22.8	16.3	26.6	-2.4	4.0
N	887	1,044	1,069	929		

TABLE 6.1B. ANTENATAL CARE VISITS AND DIFFERENCE-IN-DIFFERENCES ESTIMATES, SOKOTO V. ZAMFARA

Percentage of women 15 to 49 years with a child under 2 years reporting 1+, 4+ and 8+ ANC visits during last pregnancy, by baseline and endline rounds

	SOKOTO		ZAMFARA		DID	
	BASELINE	ENDLINE	BASELINE	ENDLINE	UNADJUSTED	ADJUSTED
	%	%	%	%	PP	PP
ANC 1+ (last pregnancy)	24.6	31.9	38.2	48.4	-3.0	7.1
ANC 4+ (last pregnancy)	17.0	21.9	26.1	37.6	-6.6	2.0
ANC 8+ (last pregnancy)	NA	4.2	NA	3.8		
ANC in first trimester	25.5	24.6	20.5	16.4	3.2	0.4
Made a birth plan	30.3	32.9	34.7	58.3	-21.1*	-20.8*
Facility delivery	13.8	13.6	16.3	26.6	-10.5	-4.1
N	1,078	967	1,069	929		

TABLE 6.1.1. PREGNANCY INTENTIONS DURING LAST PREGNANCY

Percentage of women 15 to 49 years with a child under 2 years reporting pregnancy intentions for their last-born child in the past two years, by baseline and endline rounds

PREGNANCY INTENTIONS	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
When you got pregnant with child, did you want to get pregnant at that time?						
No	8.8	5.2	7.8	9.5	14.1	10.0
Yes	91.2	94.8	92.2	90.5	86.0	90.0
Total	892	1,045	1,078	967	1,069	929
Did you want to have a baby later on or did you not want any more children?						
No more/None	24.4	26.1	22.7	20.2	23.7	30.1
Later	75.6	73.9	77.3	79.8	76.3	69.9
Total	86	49	87	95	143	104
How much longer did you want to wait (in months)?						
0–6 months	97.3	88.8	87.2	56.9	95.6	65.1
7–12 months	0.7	0.0	1.4	14.8	3.6	13.6
13–24 months	0.0	5.9	0.0	15.7	0.0	15.0
25-36 months	0.0	2.6	0.0	6.6	0.0	2.7
37–48 months	0.0	0.0	0.0	1.7	0.0	2.3
48+ months	0.0	2.6	0.0	0.0	0.0	1.4
Don't know	2.0	0.0	11.4	4.4	0.9	0.0
N	64	38	66	77	106	70

TABLE 6.1.2. SOURCE AND TIMING OF ANC DURING LAST PREGNANCY

Percentage of women 15 to 49 years with a child under 2 years reporting source and timing of ANC for their last-born child in the past two years, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Did you see anyone for ANC?	52.7	57.7	37.5	50.0	53.0	60.6
When did you first receive ANC for this pregnancy?						
0–3 months	30.7	36.3	25.5	24.6	20.5	16.4
4–6 months	53.7	55.1	60.6	63.0	63.2	68.1
7+ months	9.0	8.2	11.0	10.0	15.0	15.3
Don't know	6.6	0.4	3.0	2.4	1.4	0.2
Where did you first receive ANC?						
Her home	4.2	2.0	2.5	1.9	0.8	0.6
Other home	0.6	1.2	0.0	1.5	0.1	0.7
Government hospital or PHC	87.0	91.9	79.0	82.2	87.6	90.4
Government hospital	31.8	47.8	30.8	23.5	46.6	55.8
Governmental PHC	55.2	44.1	48.2	58.7	41.0	34.6
Dispensary/health post	2.0	1.6	12.6	11.2	3.2	3.6
Community health outreach post	2.7	1.0	0.9	0.1	4.1	1.2
Nursing/maternity home	0.2	0.4	0.6	0.6	0.0	0.2
Private hospital/clinic	1.4	1.8	3.2	1.9	0.8	0.9
Pharmacy/community pharmacy	0.5	0.0	0.4	0.0	2.6	0.0
Chemist/drug shop	0.0	0.0	0.0	0.2	0.0	1.1
Don't know/don't remember	1.0	0.0	0.0	0.0	0.0	0.0
Other (specify)	0.3	0.0	0.0	0.3	0.5	1.2
Other public source	0.2	0.0	0.0	0.0	0.0	0.0
Other private source	0.0	0.2	0.9	0.1	0.4	0.0
N	452	621	457	493	593	558

TABLE 6.1.3. WHOM DID YOU SEE FOR THE FIRST ANC VISIT DURING YOUR LAST PREGNANCY

Percentage of women 15 to 49 years with a child under 2 years reporting whom they saw for their first ANC visit for their last-born child in the past two years, by baseline and endline rounds

PROVIDER	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Doctor	16.1	18.9	19.3	13.7	10.6	19.8
Nurse/midwife	64.8	69.4	51.5	56.1	67.9	75.4
CHW	19.2	19.8	37.3	38.2	31.0	24.9
Chemist	0.8	0.0	0.0	0.7	1.4	0.0
Traditional/birth attendant	0.3	0.7	0.0	0.2	0.2	0.0
Family	1.2	1.1	0.1	0.0	0.3	0.1
Friend/neighbor	0.2	0.5	0.0	0.7	0.0	0.1
Itinerant drug seller	0.2	0.1	0.0	0.0	0.0	0.0
N	452	621	457	493	593	558

TABLE 6.1.4. ANC CONTENT DURING LAST PREGNANCY

Percentage of women 15 to 49 years with a child under 2 years reporting on the content of ANC visits for their last-born child in the past two years, by baseline and endline rounds

ITEM	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Was your blood pressure measured?	78.1	95.6	88.6	93.5	90.1	97.7
Did you give a urine sample?	66.2	78.0	67.2	77.3	79.6	88.0
Did you give a blood sample?	71.8	91.3	77.6	76.1	82.0	92.0
Were you tested for HIV?	42.6	63.2	38.7	43.1	62.7	86.5
Was your weight measured?	58.8	88.3	82.9	90.1	90.1	94.6
Did provider ask about antenatal diet?	NA	78.5	NA	67.7	NA	87.8
Did provider ask about vaginal bleeding?	48.2	77.7	45.9	58.5	54.	83.4
Were you told to pay attention to baby movements?	64.9	82.9	72.7	75.1	72.5	89.6
Did you discuss the baby due date?	44.7	72.5	39.7	51.8	53.5	83.1
Did the provider tell you about pregnancy danger signs?	54.9	72.8	63.7	70.1	62.3	82.6
During ANC, were you given a mosquito net?	25.6	7.5	17.1	5.0	36.0	18.8
N	452	621	457	493	593	558

TABLE 6.1.5. MEDICINES OR VACCINATIONS RECEIVED DURING LAST PREGNANCY

Percentage of women 15 to 49 years who received certain medicines or vaccinations during pregnancy for their last-born child in past two years, by baseline and endline rounds

MEDICATION	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Tetanus injection	38.3	46.7	32.1	42.2	47.3	54.7
Iron supplement	49.4	82.8	36.9	69.7	52.7	75.5
Folic acid supplement	45.3	55.1	38.3	44.3	53.5	57.0
Drugs for intestinal worms	28.9	45.6	18.2	19.4	17.3	30.8
N	892	1,045	1,078	967	1,069	929

TABLE 6.1.6. BIRTH PLANNING DURING LAST PREGNANCY

Percentage of women 15 to 49 years with a child under 2 years who discussed a birth plan with a health worker for their last-born child in past two years by content, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Did you discuss a birth plan with a provider?	25.2	36.2	30.3	32.9	34.7	58.4
N	892	1,087	1,078	1,045	1,069	1,011
Birth plan discussion						
Where to deliver baby?	81.0	95.3	89.3	86.2	95.3	97.3
Having a relative/friend with you in labor?	70.1	80.5	57.0	50.7	68.2	87.5
Transport to the facility?	52.6	74.4	49.3	44.5	64.2	84.6
Funds to pay for delivery?	49.2	75.0	65.5	56.6	80.4	84.0
Finding a skilled birth attendant?	63.8	86.0	72.1	54.1	73.8	87.7
N	116	227	147	161	215	340

TABLE 6.1.7. KNOWLEDGE OF ANC TIMING AND VISITS

Percentage of women aged 15 to 49 years with a child under 2 years who report the number and timing of ANC visits during pregnancy, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Number of times women should get a checkup during pregnancy						
None	3.6	0.1	1.9	3.4	4.6	5.5
1–3	6.4	14.8	5.4	11.0	9.2	10.1
4 or more	29.3	50.9	36.2	45.4	49.7	58.5
Don't know	60.8	34.2	56.5	40.1	36.5	25.9
When should women first go to ANC in pregnancy?						
As soon as she thinks she is pregnant	23.6	9.7	16.3	12.0	11.2	10.1
In the 1st trimester	9.0	23.4	10.0	21.0	16.1	22.5
At the beginning of the 2nd trimester	12.8	29.3	17.1	28.2	28.1	41.4
At the beginning of 3rd trimester	12.0	13.1	7.3	7.4	5.4	6.1
Any time during the pregnancy	19.4	15.1	12.8	13.7	15.8	5.5
Others	2.1	0.6	0.73	2.6	1.6	1.1
Don't know	21.1	8.8	35.7	15.1	21.9	13.4
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 6.1.8. REASONS FOR NOT ATTENDING ANC DURING LAST PREGNANCY

Percentage of women 15 to 49 years who did not attend ANC for their last-born child in past two years by reason, by baseline and endline rounds

REASON	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Costs too much	8.6	17.9	6.1	3.8	6.4	6.0
Don't know where to go	2.7	1.7	3.1	0.8	6.1	1.6
Facility closed	3.5	3.3	1.5	0.8	4.0	4.1
Facility distance	4.4	15.8	3.2	2.9	11.3	4.2
Transport difficult	3.0	5.7	0.8	0.7	4.6	3.1
Don't trust provider	1.0	1.0	0.3	0.4	0.2	1.2
Provider treats clients badly	0.2	1.0	0.3	0.4	0.3	0.0
Poor quality service	1.4	0.2	0.8	0.1	1.8	2.6
No female provider	1.1	0.0	4.9	0.8	5.9	3.4
Spouse opposes	23.8	22.5	17.5	24.0	29.6	19.4
Religious leader opposes	0.6	0.7	1.0	2.3	0.6	0.6
Others oppose (specify)	0.2	0.4	0.1	1.7	1.4	0.5
Don't want to go alone	1.9	1.8	1.7	2.8	1.3	4.4
Not necessary to go	52.9	44.4	47.3	54.2	35.7	42.3
Not customary	7.0	10.8	20.9	15.4	10.3	11.5
Up to God	9.8	23.7	29.8	14.7	18.7	19.4
Not yet time	0.5	0.0	0.7	0.0	5.3	1.2
N	435	466	612	552	476	453

TABLE 6.1.9. INFLUENCERS OF ANTENATAL CARE VISITS

Percentage of women aged 15 to 49 years with a child under 2 years who report influences on their decision to go to make four or more ANC visits, endline round

INFLUENCER	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
No one else	NA	4.5	NA	11.7	NA	15.5
Husband	NA	94.3	NA	85.9	NA	82.8
Mother-in-law	NA	15.6	NA	12.0	NA	3.5
Mother	NA	12.1	NA	4.1	NA	5.4
Own family	NA	0.5	NA	0.8	NA	1.8
Partner family	NA	0.0	NA	1.6	NA	0.6
Friends	NA	1.0	NA	1.0	NA	2.2
Health provider	NA	1.8	NA	1.0	NA	3.6
Community/religious leader	NA	0.0	NA	0.9	NA	0.4
N	892	1,087	1,078	1,045	1,069	1,011

This question was not asked during the baseline round.

TABLE 6.1.10. SELF-EFFICACY FOR ANC

Percentage of women aged 15 to 49 years with a child under 2 years who report confidence to recognize pregnancy complications, start a conversation with a spouse, or get to a facility for ANC, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Important to discuss pregnancy with husband	91.1	94.5	88.0	90.7	94.9	97.0
Confidence to recognize signs of pregnancy complications	NA	93.7	NA	88.4	NA	91.1
Confidence to start a conversation with husband about ANC	76.5	78.3	65.4	74.8	74.1	85.8
Confidence that you could get to the facility for ANC	68.3	74.2	61.3	68.1	70.6	81.4
Likely to make 4+ ANC visits for next pregnancy	NA	75.3	NA	71.3	NA	83.6
Likelihood to take SP/Fansidar to prevent malaria if you become pregnant again	80.8	84.4	66.3	77.6	82.2	84.8
N	892	1,087	1,078	1,045	1,069	1,011

TABLE 6.1.11. PERCEIVED MATERNAL BENEFITS OF ANC

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who report ANC benefits for themselves by type of benefit, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
MATERNAL BENEFIT	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
No benefits	3.8	2.2	7.2	3.6	4.5	4.2
Monitor baby's growth by provider	62.6	76.2	59.0	59.0	68.6	77.1
Monitor mother's health by the provider	61.0	76.5	59.0	65.1	71.5	73.1
Receive mosquito net	20.8	19.9	9.0	5.2	27.4	21.7
Receive medicine to prevent malaria during pregnancy	25.9	39.1	15.2	16.7	28.7	31.9
Reduce risk of pregnancy complications	16.4	27.1	11.6	19.1	17.6	24.7
Reduce risk of delivery complications	12.1	26.1	7.9	11.2	16.3	21.3
Help mother prepare for postpartum and neonatal	0.0	14.3	0.0	2.5	0.0	8.8
N	892	1,087	1,078	1,045	1,069	1,011

TABLE 6.1.12. WHAT ARE SOME DANGER SIGNS DURING PREGNANCY?

Percentage of women 15 to 49 years with a child under 2 years who report any danger signs during pregnancy by type, by baseline and endline rounds

DANGER SIGN	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
No knowledge of danger signs	9.9	3.2	10.3	2.9	7.3	3.1
Severe weakness	37.1	39.4	32.4	35.2	49.6	43.5
Convulsions or fits	24.1	36.0	16.1	14.5	31.7	32.6
Severe headache	33.2	37.1	24.9	24.4	41.8	35.8
Blurred vision	20.0	30.0	11.5	14.8	16.5	20.9
Fever	39.0	43.5	44.5	50.6	44.7	52.5
Severe stomach pain	39.9	48.3	32.0	27.4	32.4	26.2
Fast or difficult breathing	19.5	20.7	20.5	15.5	27.4	27.0
Swollen feet	15.9	20.4	12.6	5.3	14.9	28.0
Vaginal bleeding	0.0	65.4	0.0	42.5	0.0	56.7
Child not moving	0.0	48.4	0.0	29.4	0.0	34.4
N	892	1,087	1,078	1,045	1,069	1,011

6.2 Delivery care

Key findings

Breakthrough ACTION/Nigeria SBC interventions sought to increase the percentage of women in Kebbi and Sokoto who deliver in a health facility.

Delivery location and assistance: The percentage of births occurring in a health facility increased by 7 pp in Kebbi (15% at baseline, 23% at endline) but by a larger amount, 11 pp, in Zamfara (16% at baseline, 27% at endline) (Table 6.2.1). In Sokoto, the percentage remained the same (14%). About 70% of women aged 15 to 49 years with a completed pregnancy in the past two years had home deliveries across the study states. There were slight declines in home deliveries in both Zamfara state (72% at baseline, 66% at endline) and Kebbi (77% at baseline, 71% at endline); however, Sokoto had an increase from 76% at baseline to 84% at endline. Births were most commonly assisted by traditional birth attendants across the three states (Table 6.2.2). At baseline, it was common to have family assisting with the delivery (Kebbi: 42%, Sokoto: 33%, Zamfara: 36%). At endline, there was an appreciable decline to 23%, 17% and 12% for Kebbi, Sokoto, and Zamfara states respectively. There was a slight increase in the percentage of women who delivered in a health facility in Kebbi (12% at baseline, 17% at endline); and Zamfara (18% at baseline, 22% at endline); Sokoto experienced a decline (15% at baseline, 12% at endline).

Among women who did not have a facility delivery, the most common reasons for not doing so were a lack of perceived need to go to a health facility, spousal opposition, and costs. However, when compared with the endline, there was a notable decline across all three states in the percentage of respondents who mentioned a lack of perceived need to go to a health facility (Kebbi: 76% at baseline, 57% at endline; Sokoto: 74% at baseline, 66% at endline; Zamfara: 61% at baseline, 49% at endline) (Table 6.2.3).

Self-efficacy and decision-making: As with ANC, the majority of women (Kebbi: 93%: Sokoto: 85%; Zamfara: 81%)) reported that their husbands influence their decision to have a facility delivery. (Table 6.2.4). Even so, while husbands are critical to decision-making, discussions with husbands about where to deliver are infrequent; only 21% of women in Kebbi, 13% in Sokoto, and 30% in Zamfara reported that they had discussed where to deliver (Table 6.2.5). This absence of discussion is puzzling, as most women—66% in Kebbi, 56% in Sokoto, and 71% in Zamfara—indicate that they are confident that they could initiate such a discussion, perhaps indicating an implicit understanding of the delivery location as between husbands and wives. Self-efficacy to get to a facility for delivery varied across states women and was far from universal, increasing from 47% to 59% in Kebbi and from 43% to 64% in Zamfara but remaining largely unchanged in Sokoto (43% at baseline and 43% at endline). Confidence to get to a health facility for delivery was higher, however, if complications were to arise (87% in Kebbi, 80% in Sokoto, and 92% in Zamfara) (Table 6.2.8).

Delivery ideations: While many women cited lack of perceived need as a reason for not delivering in a health facility, 73% (Kebbi), 53% (Sokoto), and 64% (Zamfara) of women agreed that a health facility is the best place to deliver a baby, with larger increases in the integrated states relative to Zamfara (adjusted DID Kebbi—Zamfara: 12 pp; adjusted DID Sokoto—Zamfara: 4.5 pp), although these estimates were not statistically significant. Further, increasing majorities of women in Kebbi: (56% at baseline, 63% at endline) and Zamfara (53% at baseline, 66% at endline) reported intentions to deliver their next child at a health facility (Table 6.2.6). In Sokoto, less than half of women (46%) indicated that they planned to deliver their next child in a health facility.

TABLE 6.2.1. DELIVERY LOCATION AND RESPECTFUL CARE DURING THE LAST PREGNANCY

Percentage of women 15 to 49 years with a child under 2 years reporting where they gave birth during the delivery of their last-born child in past two years and respectful care among facility births, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Where did you give birth?						
Any health facility	14.8	22.8	13.8	13.6	16.3	26.6
Own home	77.1	71.4	75.6	83.7	72.2	65.8
Other home	7.1	4.1	6.3	2.1	10.2	2.9
Government hospital	7.4	13.7	7.6	5.2	11.4	19.6
Government PHC	7.0	7.5	4.8	7.5	3.1	5.8
Dispensary/health post	0.1	0.1	0.5	0.4	0.0	0.2
Community health outreach post	0.1	0.0	0.0	0.0	0.8	0.4
Nursing/maternity home	0.0	0.5	0.0	0.2	0.6	0.2
Private hospital/clinic	0.2	0.7	0.9	0.3	0.5	0.4
Other	0.8	1.8	4.1	0.4	0.9	4.7
Don't know	0.2	0.0	0.2	0.0	0.4	0.0
Total	892	1,045	1,078	967	1,069	929
When you were in labor or giving birth, did you ever feel like you were being ignored or neglected by health facility staff?	15.1	8.0	12.4	26.0	14.8	14.2
When giving birth, did you have privacy?						
No	25.5	14.5	3.2	4.4	13.1	3.4
Yes, separate room	44.5	34.5	47.2	27.9	25.7	24.6
Yes, curtains	28.8	47.7	48.5	67.7	59.8	71.7
Yes, other	0.0	3.3	0.0	0.0	1.3	0.3
Don't know	1.2	0.0	1.1	0.0	0.0	0.0
N	138	242	156	138	194	249

TABLE 6.2.2. WHO ASSISTED IN THE DELIVERY OF YOUR CHILD DURING THE LAST PREGNANCY?

Percentage of women 15 to 49 years with a child under 2 years reporting who had assistance in the delivery of their last-born child in the past two years by person who assisted, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
PROVIDER	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Doctor	3.9	3.6	4.1	1.3	3.0	7.3
Nurse/midwife	22.2	19.2	10.2	10.0	17.0	23.2
CHW	5.1	7.8	5.2	6.2	7.5	8.2
Traditional/birth attendant	15.5	34.0	36.5	35.1	29.9	24.9
Religious leader	0.3	0.1	0.1	0.1	0.1	0.1
Family	42.0	23.4	32.5	16.6	35.5	11.9
Friend/neighbor	17.9	11.6	8.0	10.3	15.4	13.7
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 6.2.3. REASONS FOR NOT DELIVERING IN A HEALTH FACILITY DURING THE LAST PREGNANCY

Percentage of women 15 to 49 years with a child under 2 years who did not deliver their last-born child in the past two years in a health facility by reasons for non-facility delivery, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
REASON	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Costs too much	7.3	10.8	4.5	3.9	4.5	7.1
Facility closed	2.2	1.4	1.3	2.5	4.7	2.7
Facility distance	3.0	8.5	2.6	1.9	7.8	4.3
Poor quality service	0.7	0.4	0.6	0.4	0.4	1.0
No female provider	0.6	0.1	1.3	0.1	4.4	1.7
Spouse opposes	15.9	19.5	14.1	16.2	35.7	19.0
Not necessary to go	75.7	57.4	74.3	66.0	61.4	49.0
N	750	846	908	907	860	762

TABLE 6.2.4. WHO ELSE INFLUENCES DECISION ABOUT FACILITY DELIVERY?

Percentage of women aged 15 to 49 years with a child under 2 years who report influences on their decision to go to a facility for delivery, endline round

INFLUENCER	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
No one else	NA	5.2	NA	13.0	NA	16.1
Husband	NA	93.3	NA	84.7	NA	81.1
Mother-in-law	NA	18.0	NA	12.8	NA	4.0
Mother	NA	12.7	NA	5.3	NA	6.4
Own family	NA	0.2	NA	0.7	NA	1.0
Partner family	NA	0.2	NA	0.8	NA	0.8
Friends	NA	0.9	NA	0.5	NA	1.1
Health provider	NA	3.1	NA	1.4	NA	3.5
Community/religious leader	NA	0.4	NA	1.0	NA	0.4
N	892	1,087	1,078	1,045	1,069	1,011

This question was not asked during the baseline round.

TABLE 6.2.5. SPOUSAL DISCUSSION ABOUT DELIVERY CARE

Percentage of women 15 to 49 years with a child under 2 years who reported having a discussion with their spouse about where to give birth by discussion topic at endline round

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Discuss with partner about facility birth?	NA	21.3	NA	13.4	NA	30.0
Discussion topic:						
Benefits?	NA	18.3	NA	7.3	NA	24.6
Where to deliver?	NA	14.1	NA	7.3	NA	18.6
Who should assist?	NA	12.0	NA	2.4	NA	13.7
Who goes with you?	NA	9.2	NA	1.6	NA	12.3
Transport?	NA	8.0	NA	1.6	NA	11.3
Cost?	NA	7.0	NA	2.1	NA	11.9
Birth plan	NA	5.0	NA	0.9	NA	5.0
Potential complications	NA	3.3	NA	0.6	NA	3.6
Immediate breastfeeding?	NA	2.3	NA	0.0	NA	1.5
N	892	1,045	1,078	967	1,069	929

TABLE 6.2.6. PREGNANCY-RELATED BELIEFS, ATTITUDES AND VALUES, KEBBI V ZAMFARA

Percentage of women aged 15 to 49 years with a child under 2 years who agree with certain beliefs, attitudes, or values about ANC, by baseline and endline rounds

ATTITUDE	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
The health facility is the best place to deliver a baby	57.7	72.6	56.5	64.4	7.0	11.8
Severe complications may occur during child-birth	NA	95.4	NA	91.8	NA	NA
N	892	1,088	1,069	1,011		

*** p<.001, **p<.01, * p<.05

TABLE 6.2.7. PREGNANCY-RELATED BELIEFS, ATTITUDES AND VALUES, SOKOTO V ZAMFARA

Percentage of women aged 15 to 49 years with a child under 2 years who agree with certain beliefs, attitudes, or values about ANC, by baseline and endline rounds

ATTITUDE	SOKOTO		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
The health facility is the best place to deliver a baby	46.4	52.8	56.5	64.4	-1.5	4.5
Severe complications may occur during child-birth	NA	90.1	NA	91.8	NA	NA
N	1,078	1,045	1,069	1,011		

*** p<.001, **p<.01, * p<.05

TABLE 6.2.8. SELF-EFFICACY AND INTENTIONS FOR FACILITY BIRTH DURING THE NEXT PREGNANCY

Percentage of women aged 15 to 49 years with a child under 2 years who report self-efficacy to get to a health facility and talk to a husband and intent to attend ANC and have a facility birth during the next pregnancy, by baseline and endline rounds

LOCATION	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Confident to start a conversation with the husband about facility delivery?	55.2	65.6	46.8	56.3	49.8	70.5
Confident that you could get to a facility for delivery?	47.1	59.0	43.1	42.6	43.2	63.8
Confident that you could get to the facility if complications arise?	NA	87.4	NA	80.2	NA	91.5
Likelihood to have a facility delivery if you become pregnant again	56.2	62.6	44.2	45.7	52.6	65.7
Total	892	1,088	1,078	1,045	1,069	1,011

6.3 Newborn care

Key findings

In Kebbi and Sokoto, Breakthrough ACTION/Nigeria targets improved newborn practices, including putting the newborn on the mother's chest immediately after birth, cutting the cord with a new blade, putting chlorhexidine on the cord, and providing misoprostol use to prevent bleeding.

Newborn care practices: Among women who delivered in a health facility, nearly all newborn practices improved in all three states. The percentage of newborns who were wiped dry after birth increased in Kebbi (89% at baseline, 97% at endline), Sokoto (84% at baseline, 95% at endline), and Zamfara (94% at baseline, 97% at endline) (Table 6.3.1). The percentage of mothers who reported placing the newborn on a bare chest immediately after birth also increased in Kebbi (56% at baseline, 78% at endline) and Zamfara states (65% at baseline, 84% at endline), while Sokoto experienced a decline from 72% at baseline to 60% at the endline. At endline, nearly all babies delivered in facilities had their umbilical cord cut with a new blade (Kebbi: 98%, Sokoto: 96%, Zamfara: 98%), an improvement from baseline (Kebbi: 82%, Sokoto: 94%, Zamfara: 92%). About three quarters of facility-born infants at endline in Kebbi (76%) and Zamfara (77%) had chlorhexidine applied to their stump at the endline, higher than in Sokoto (61%). At endline, only a minority of babies delivered in health facilities were bathed (30% in Kebbi, 36% in Sokoto, and 13% in Zamfara). Nearly all of these were bathed in the first 24 hours. In facility-born infants, the use of misoprostol increased from 51% to 82% in Kebbi and from 53% to 60% in Sokoto, and from 62% to 80% in Zamfara.

Among babies delivered outside of formal health facilities, the above practices were less commonly followed. The percentage of newborns who were wiped dry after birth decreased in Kebbi (48% at baseline, 29% at endline), increased in Sokoto (42% at baseline, 49% at endline), and decreased in Zamfara (43% at baseline, 29% at endline) (Table 6.3.1b). Most babies delivered at home were bathed (78% in Kebbi, 79% in Sokoto, and 72% in Zamfara), and nearly all of these were bathed in the first 24 hours. Placing the newborn on the mother's bare chest immediately after birth was uncommon, performed for only 30% of newborns in Kebbi, 4% of newborns in Sokoto, and 15% of newborns in Zamfara at endline. There were, however, improvements in the practice of cutting the umbilical cord with a new blade in Kebbi (from 86% to 96% in Kebbi) and in Sokoto (from 90% to 94%) but the practice remained unchanged in Zamfara (90% at baseline and 89% at endline). Very few homebirths involved applying chlorhexidine applied to the umbilical stump at the endline (Kebbi: 16%, Sokoto: 8%, Zamfara: 10%). The use of misoprostol was also uncommon: 18% in Kebbi, 6% in Sokoto, and 12% in Zamfara at endline.

Postpartum care and counseling: Among respondents with a completed pregnancy in the past two years, about one-third received a postpartum check following birth in Kebbi and Zamfara states (Table 6.3.2). However, while there was a notable increase at the endline for Kebbi state, postpartum checks in Sokoto and Zamfara were roughly the same at baseline and endline. Among women who had a postpartum check, over 70% in Kebbi and Zamfara received a check within the first 12 hours postbirth in Kebbi, only 39% of postpartum checks in Sokoto occurred in the first 12 hours, a decrease from 66% at baseline. Most respondents received postpartum care from nurses/midwives. Other providers of care included community health workers and doctors.

Less than one in five of respondents were counseled on postpartum family planning in the first few days after delivery at the endline (Table 6.3.2). Kebbi and Zamfara experienced an increase from baseline whereas Sokoto had a slight decline. Similarly, counseling on maternal nutrition was generally low across the three states and at baseline and endline. Sokoto showed a sharp decline in this indicator from 21% at baseline to 11% at the endline.

While most respondents at baseline mentioned immediate breastfeeding as a way to protect a newborn after delivery (Table 6.3.3), there was a notable decline across the three states for this indicator (Kebbi: 71% at baseline, 53% at endline; Sokoto: 54% at baseline, 31% at endline; Zamfara: 67% at baseline, 53% at endline). Other measures mentioned include skin-to-skin contact, bathing the baby, keeping the baby warm, and use of chlorhexidine for the baby's stump, although reporting of the latter was uncommon across all three states at endline (7% in Kebbi, 1% in Sokoto, and 3% in Zamfara). Surprisingly, more respondents from Kebbi at the endline (23%) also mentioned the use of traditional medicine for baby stump than at baseline (16%).

All respondents were asked about ways to help a mother recover from childbirth. While most respondents reported rest and good nutrition, far fewer reported the

need to take misoprostol immediately after birth, thereby indicating low awareness of this practice, similar to the baseline findings across the three states. These results point to low awareness and provision of postpartum care and counseling in study areas to help women recover from childbirth. (Table 6.3.4)

TABLE 6.3.1. NEWBORN CARE IMMEDIATELY AFTER DELIVERY: FACILITY DELIVERIES

Percentage of women 15 to 49 years with a child under 2 years reporting the following procedures done immediately after delivery for her last-born child in the past two years, by baseline and endline rounds

LOCATION	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Was the child wiped dry after birth?	88.8	96.7	84.4	95.4	94.1	97.1
Was the child bathed after birth?	20.0	29.8	23.2	36.3	29.2	13.0
N	142	242	169	135	209	249
How long after birth was child first bathed?						
<1 hour	0.0	8.7	0.0	16.5	0.0	9.8
1	38.8	28.3	69.6	7.2	44.8	34.4
2	18.5	19.3	8.0	10.5	18.7	11.6
3–5	20.1	26.5	16.8	22.9	26.7	9.6
6–11	5.8	8.3	0.0	19.9	5.6	4.7
12–23	0.0	5.9	2.7	21.9	4.3	6.6
24+	9.5	3.0	0.0	1.1	0.0	23.4
Don't know	7.2	0.0	2.9	0.0	0.0	0.0
N	24	71	36	46	53	34
Care after birth						
Child put on bare skin	55.8	77.8	71.9	60.0	65.1	84.3
Cut cord with new blade	82.3	97.8	94.2	96.2	91.8	97.6
Chlorhexidine for stump	64.9	76.3	65.3	61.1	66.2	76.8
Given misoprostol (miso miso)	51.1	81.7	53.1	60.2	61.8	79.5
N	142	242	169	135	209	249

TABLE 6.3.1B. NEWBORN CARE IMMEDIATELY AFTER DELIVERY: HOME DELIVERIES

Percentage of women 15 to 49 years with a child under 2 years reporting the following procedures done immediately after delivery for her last-born child in the past two years, by baseline and endline rounds

LOCATION	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Was the child wiped dry after birth?	47.8	28.8	41.5	49.2	42.8	28.6
Was the child bathed after birth?	73.9	77.7	75.3	79.4	73.1	72.3
N	750	802	909	829	860	680
How long after birth was child first bathed?						
<1 hour	0.0	44.7	0.0	20.2	0.0	36.9
1	59.4	34.1	49.7	28.9	49.1	35.6
2	9.7	15.0	15.1	23.0	13.0	10.3
3-5	4.1	3.2	10.5	14.6	21.1	4.8
6-11	2.0	1.4	7.5	3.1	6.2	1.5
12–23	3.0	1.1	7.4	5.5	5.1	1.7
24+	9.1	0.6	6.2	4.5	4.2	9.2
Don't know	12.8	0.0	3.7	0.2	1.3	0.0
N	515	624	689	660	624	498
Care after birth						
Child put on bare skin	27.3	29.5	26.7	4.3	13.0	15.4
Cut cord with new blade	86.1	96.1	90.0	94.3	90.4	88.5
Chlorhexidine for stump	9.2	16.2	7.9	8.0	8.7	9.5
Given misoprostol (miso miso)	7.2	18.4	6.2	5.5	12.2	12.4
N	750	802	909	829	860	680

TABLE 6.3.2. POSTPARTUM CARE FOR MOTHERS AFTER DELIVERY

Percentage of women 15 to 49 years with a child under 2 years reporting the following procedures done within two days after delivery for her last-born child in the past two years, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Did anyone check your health after birth?	18.2	30.8	22.2	22.7	33.1	32.2
How long after delivery did the first check take place?						
0–11 hours	82.5	71.1	65.7	39.3	63.8	75.1
12–23 hours	2.1	0.1	0.7	0.0	1.0	1.0
24+ hours	15.4	28.8	33.7	60.7	35.2	23.9
Who checked on your health at that time?						
Other health personnel (specify)	0.0	0.6	0.0	0.0	0.4	0.0
Doctor	19.4	28.0	22.1	10.8	22.6	33.0
Nurse/midwife	52.5	38.4	23.0	42.2	31.8	36.2
Community health worker	20.1	24.9	18.9	34.9	30.0	25.4
Chemist	0.8	0.8	0.1	1.6	8.0	2.2
Traditional healer/birth attendant	4.5	6.0	8.8	3.6	4.9	3.0
Religious leader	0.0	0.0	0.4	0.0	0.0	0.0
Family/husband	2.8	0.7	22.8	5.1	1.1	0.0
Friends/neighbors	0.0	0.4	3.5	1.0	0.5	0.2
After birth, did anyone talk to you about using contraception?	7.9	13.8	11.2	9.5	12.	16.3
Did anyone counsel you on mother nutrition?	11.5	23.4	21.3	10.8	15.0	18.4
N	892	1,044	1,078	967	1,069	929

TABLE 6.3.3. WHAT ARE SOME WAYS TO PROTECT A NEWBORN IMMEDIATELY AFTER BIRTH?

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who report ways to protect a newborn immediately after birth by method, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
WAYS TO PROTECT	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Skin to skin contact	20.3	22.1	20.7	3.5	17.9	14.8
Immediate breastfeeding	71.1	52.8	53.6	31.0	67.2	53.2
Give fluids excluding breastmilk	16.9	11.1	20.5	17.3	9.9	5.5
Get child immunized	15.3	19.7	18.6	10.0	26.1	17.9
Chlorhexidine for baby's stump	3.9	7.3	5.6	1.4	8.4	2.8
Traditional medicine for stump	15.9	23.3	21.3	13.4	18.5	8.0
Bathe the baby	NA	63.9	NA	66.3	NA	42.5
Keep baby warm/give clothes	NA	69.6	NA	44.3	NA	50.5
Gave baby dates	NA	14.6	NA	19.7	NA	21.4
Put baby in mosquito net	NA	24.7	NA	16.7	NA	28.5
Up to God	NA	8.5	NA	11.9	NA	3.3
N	892	1,087	1,078	1,045	1,069	1,011

TABLE 6.3.4. WHAT ARE SOME WAYS TO HELP A MOTHER RECOVER WELL AFTER BIRTH?

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who report ways to help a mother recover well from childbirth by method, by baseline and endline rounds

WAYS TO RECOVER	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Take misoprostol immediately after birth	5.3	10.2	10.6	4.7	17.8	10.7
Ensure good nutrition is taken	63.3	61.8	46.2	38.6	60.7	62.1
Lose weight gained during pregnancy	4.8	5.8	6.2	0.7	12.3	5.5
Resume regular activity immediately	13.0	11.7	14.5	4.9	24.9	24.6
Rest	53.1	88.6	73.0	55.2	62.1	75.0
Bathe in hot water	NA	87.2	NA	88.6	NA	63.1
Consume hot water/ traditional drinks	NA	58.8	NA	68.1	NA	36.1
Initiate postpartum family planning	NA	2.8	NA	1.3	NA	1.8
N	892	1,087	1,078	1,045	1,069	1,011

Chapter 7. Nutrition and breastfeeding

Breastfeeding key findings

In Kebbi and Sokoto, Breakthrough ACTION/Nigeria promotes immediate breastfeeding after birth and exclusive breastfeeding for the first six months of a child's life. The program also promotes proper nutrition for pregnant women and new mothers. Nonetheless, many of the indicators related to breastfeeding worsened in the integrated states, but these changes were also apparent in the malaria-only state.

Despite high rates of ever breastfeeding children in Kebbi (98% at baseline, 96% at endline), Sokoto (98% at baseline, 99% at endline), and Zamfara (95% at baseline, 97% at endline), initiation of breastfeeding within one hour of birth (e.g., immediate breastfeeding) trended downwards in all three states (Table 7.1.1). However, there was a sharp difference in immediate breastfeeding practices between infants delivered in health facilities and infants delivered at home. In all three states, infants delivered in a health facility were more likely at endline (Kebbi: 57%, Sokoto: 39%, Zamfara: 64%) to be put to the breast immediately relative to baseline (Kebbi: 50%, Sokoto: 37%, Zamfara: 51%). However, the opposite was the case for infants delivered at home, which declined in all three states (Kebbi: 40% at baseline and 33% at endline, Sokoto: 31% at baseline and 22% at endline, Zamfara: 45% at baseline and 37% at endline). Given that most births still occur outside of health facilities, this meant that the overall prevalence of immediate breastfeeding declined.

Exclusive breastfeeding among children under 6 months of age was lower in Kebbi (17%), Sokoto (11%) and Zamfara (37%) at endline, compared to baseline values of 20%, 29% and 46% respectively (Table 7.1.2). This low coverage is in large part due to high rates of giving non-breastmilk liquids to a child in the first three days after birth, with practice of this behavior remaining roughly constant from baseline to endline in Kebbi (77% at baseline, 80% at endline) but increasing in Sokoto (70% at baseline, 89% at endline) and Zamfara (50% at baseline, 66% at endline) (Table 7.1.1). Furthermore, the study found that at endline, 17% of respondents in Kebbi, 32% in Sokoto and 19% in Zamfara at endline agreed that the mother's breast milk after birth is bad (Tables 5.2.5, 5.2.6). While this represents a substantial decrease from baseline in Kebbi (29%), Sokoto showed a slight increase (32%), and there was no notable improvement in Zamfara (19%). This belief may be linked with giving non-breastmilk liquids to a newborn. Taken together, these point to a potential area for SBC activities to continue to promote exclusive breastfeeding and dispel myths about a mother's breast milk following birth.

Among the very few respondents (<2%) who never breastfed, the most common reasons differed across the states (7.1.3). For example, in Kebbi, the most common reasons at endline were partner opposition (73%), respondent opposition (65%) and fatalism ("Up to God") (22%). In Sokoto, the reasons were introduction of other fluids (20%), partner opposition (15%) and perception of breastfeeding as not necessary (10%), while in Zamfara they were respondent opposition (52%), partner opposition (25%) and fatalism ("Up to God") [23%]. This highlights that differences in context for Breakthrough ACTION/Nigeria SBC interventions as barriers and facilitators to breastfeeding may differ across states, hence interventions need to be tailored according to each state's context.

Notably, while reported spousal opposition to breastfeeding declined in Sokoto (25% at baseline, 15% at endline) and Zamfara (30% at baseline, 25% at endline), it increased two-fold in Kebbi (37% at baseline, 73% at endline) (Table 7.1.3). Furthermore, respondent opposition increased by almost 13-fold in Kebbi (5% at baseline, 65% at endline), meanwhile, Sokoto had the largest decline (34% at baseline, 0% at endline) with a slight decrease in respondent opposition in Zamfara (54% at baseline, 52% at endline). Because the number of children who were not breastfed was quite small, these numbers should be taken with extreme caution.

Respondents were also asked about the benefits of breastfeeding for women and for infants (Tables 7.2.1, 7.2.2). At endline, the most commonly reported benefits to mothers were convenience (Kebbi: 36%, Sokoto: 12%, Zamfara: 36%) and promoting infant bonding (Kebbi: 29%, Sokoto: 9%, Zamfara: 32%). In all three states, roughly one in five women reported no benefits to the mother of breastfeeding. The most commonly identified benefits to the child were good nutrition (Kebbi: 49%,

Sokoto: 23%, Zamfara: 55%) and prevention of illness (Kebbi: 35%, Sokoto: 18%, Zamfara: 44%).

Awareness that children should be breastfed for at least two years was low. At endline, only 16% of women in Kebbi provided this response, an almost 50% decline from baseline (30%). Declines in Sokoto (24% at baseline, 16% at endline) and Zamfara (19% at baseline, 16% at endline) were smaller. At endline, nearly four in five (Kebbi: 81%, Sokoto: 84%, Zamfara: 82%) of respondents reported that breastfeeding should last 12 to 23 months,

Most women, including about three in five women in Kebbi (64%) and Sokoto (62%) and three-quarters in Zamfara (78%), agreed that exclusive breastfeeding was important. Most respondents (Kebbi: 87%, Sokoto: 90%, Zamfara: 90%) also agreed that breast milk contains essential nutrients for the child's first six months of life, a modest increase from baseline (Kebbi: 79%, Sokoto: 85%, Zamfara: 88%) (Table 7.2.4, 7.2.5)

While women largely believe in the importance of breastfeeding, self-efficacy to correctly breastfeed was not universal. Only about half of respondents in Kebbi (44%) and Sokoto (44%) and almost three in four women in Zamfara (70%) at endline felt confident to exclusively breastfeed their child for the first six months, a similar or modest increase from baseline (Kebbi: 39%, Sokoto: 44%, Zamfara, 65%) (Table 7.2.4, 7.2.5).

Descriptive norms about breastfeeding suggest inherent gaps and weak social norms favoring exclusive breastfeeding. Only 30% (Kebbi), 29% (Sokoto) and 50% (Zamfara) of respondents at baseline and 36% (Kebbi), 31% (Sokoto) and 67% (Zamfara) at endline believed that most women in their communities gave breastmilk alone to infants. Further, intentions to exclusively breastfeed the next child for the first six months remained largely unchanged at endline (Kebbi: 49%, Sokoto: 50%, Zamfara: 68%) from baseline (Kebbi: 46%, Sokoto: 46%, Zamfara: 68%).

All respondents were asked who else influences decisions about breastfeeding, with the most common responses across the three states being husband (Kebbi: 87%, Sokoto: 73%, Zamfara: 72%) and no one else for Sokoto (20%) and Zamfara (23%) alone, in contrast to Kebbi where mothers-in-law (19%) were also influential (Table 7.2.3).

Nutrition key findings

According to the IYCF guidelines, at around six months of age, complementary foods should be introduced alongside continued breastfeeding. Complementary foods should be nutrient-dense, safe, and culturally appropriate, meeting the child's evolving nutritional needs.

Regarding the frequency of complementary feeding, most respondents reported feeding their child aged 6–23 months with solid or semi-solid food three or more times in Kebbi (67%), Sokoto (53%), and Zamfara (58%), with an increase at endline (Kebbi 80%, Sokoto 63%, Zamfara 70%). The proportion of women feeding their infants and young children two times uniformly decreased across Kebbi (baseline 24%, endline 14%), Sokoto (baseline 29%, endline 23%), and Zamfara (baseline 29%, endline 18%) [Table 7.1.5]. This may not necessarily reflect that fewer women at endline are feeding their child at least two times a day relative to baseline. It could be that more women are moving from feeding their children twice a day to feeding them three or more times, given the increase in the proportion of self-reported meal frequency. Monitoring the frequency of solid or semi-solid food consumption provides valuable information on the progress of children's transition from exclusive breastfeeding to complementary feeding. It helps identify gaps and challenges in achieving optimal feeding practices and can guide interventions aimed at improving child nutrition outcomes.

Furthermore, the diet should include a diverse range of nutrient-dense foods, such as fruits, vegetables, grains, proteins (meat, poultry, fish, legumes), dairy products, and healthy fats, with special attention given to foods rich in iron, vitamin A, zinc, and other essential nutrients crucial for growth and development.

In addition to breast milk, the majority of the children aged 6–23 months were given grains at both baseline and endline in Kebbi (baseline 85%, endline 88%), Sokoto (baseline 88%, endline 89%), and Zamfara (baseline 84%, endline 86%) in the previous 24 hours. While more than half of the infants and young children consumed dairy products the previous day in Zamfara alone, dairy consumption did not improve at endline (Kebbi 48%, Sokoto 53%, Zamfara 57%) relative to baseline (Kebbi 34%, Sokoto 43%, Zamfara 58%). Furthermore, consumption of beans and nuts was relatively low across all states at endline (Kebbi 39%, Sokoto 42%, Zamfara 36%), and about a third were given flesh foods at endline (Kebbi

34%, Sokoto 22%), with the largest decline observed in Zamfara (28%) from baseline (43%). Among all food groups, Vitamin A-rich foods were the least consumed in Kebbi (baseline 9%, endline 7%), Sokoto (baseline 6%, endline 3%), and Zamfara (baseline 11%, endline 13%).

These results show that emphasis should be placed on the importance of nutrient-dense complementary foods, and information through SBCC should be provided on the specific food groups that should be included in the child's diet. Additionally, messaging should be tailored to incorporate local and available food products that can promote optimal feeding practices within communities.

7.1 Child nutrition and breastfeeding

TABLE 7.1.1. BREASTFEEDING PRACTICES IMMEDIATELY AFTER BIRTH

Percentage of last-born children in past two years who ever breastfed, initiated breastfeeding within one hour of birth, or received non-breastmilk liquids in first three days, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Did you ever breastfeed a child?	98.1	96.4	97.6	98.9	95.1	97.2
Immediate breastfeeding (All births): Did the child start breastfeeding within 1 hour of birth?	41.6	39.2	31.6	24.2	46.1	43.2
Immediate breastfeeding (Facility births): Did the child start breastfeeding within 1 hour of birth?	49.9	57.3	37.3	38.7	51.2	64.0
Immediate breastfeeding (Home deliveries): Did the child start breastfeeding within 1 hour of birth?	40.1	33.3	30.6	22.3	45.4	36.5
N	892	1083	1078	1032	1069	986
First 3 days, was child given something to drink apart from breastmilk?	76.9	79.5	70.3	88.5	49.7	65.9
N	864	1,046	1,045	1,021	1,004	958

TABLE 7.1.2. BREASTFEEDING PRACTICES AMONG INFANTS AGED 0-5 MONTHS

Percentage of last-born children in past two years aged 0-5 months who were ever breastfed, are still breastfeeding, and are exclusively breastfed,** by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%.	%	%	%	%	%
Did you ever breastfeed child?	98.7	96.9	99.2	100.0	95.7	99.4
N	212	216	276	213	233	207
First 3 days, was child given something to drink apart from breastmilk?	73.9	78.9	62.0	88.6	47.7	58.4
Are you still breastfeeding?	96.1	98.3	94.8	96.7	97.4	98.1
N	206	209	273	213	221	205
Are you giving child soft or semi-solid food?	14.7	17.8	18.3	21.1	17.7	20.3
Exclusive breastfeeding: (Derived). Was the child exclusively breastfed (0–5 months)?	20.3	16.6	29.3	11.0	45.9	37.4
N	212	216	276	213	233	207

Note that exclusive breastfeeding in BSS is defined as infants 0-5 months who are currently breastfeeding and who received no solid or semi-solid foods in the past 24 hours and no non-breastmilk liquids in the first three days after birth.

TABLE 7.1.3. REASONS FOR CHOOSING NOT TO EVER BREASTFEED YOUR CHILD

Percentage of women 15 to 49 years with a child under 2 years who did not ever breastfeed their last-born child by reasons for choosing not to breastfeed, by baseline and endline rounds

REASON	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Respondent opposes	4.6	65.0	34.4	0.0	54.1	52.1
Partner opposes	36.8	72.8	25.1	15.3	29.6	24.6
Religious leaders oppose	0.0	0.0	0.0	7.9	4.1	0.0
Inadequate milk	7.6	10.6	9.3	5.5	3.5	6.4
Too painful	2.7	2.7	17.5	0.0	0.0	0.0
Not necessary	22.8	13.4	14.0	10.1	7.6	2.7
Up to God	22.5	21.7	19.7	7.9	9.5	22.7
Introduce other fluids	10.1	0.0	2.2	20.4	4.7	5.4
N	28	37	33	11	65	28

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

TABLE 7.1.4. REASONS FOR GIVING NON-BREASTMILK LIQUIDS TO A NEWBORN IN THE FIRST THREE DAYS AFTER BIRTH

Percentage of women 15 to 49 years with a child under 2 years who gave non-breastmilk liquids in the first three days to last-born child by reasons for not exclusively breastfeeding, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Respondent opposes	37.3	15.5	36.3	18.6	43.2	33.5
Partner opposes	29.7	37.5	26.0	18.5	39.2	36.1
Religious/community leaders oppose	2.1	2.7	7.1	4.1	2.8	2.8
Inadequate milk for newborn	14.5	10.9	13.5	8.3	17.7	8.9
Painful breastfeeding	0.9	0.9	1.1	1.0	1.0	5.1
Not necessary	24.9	26.3	17.1	21.8	21.8	12.2
Health worker attitude	0.0	0.1	0.1	0.1	0.4	0.0
Up to God	12.4	16.0	11.4	8.9	12.8	16.9
Introduce food <6 months	2.0	8.3	3.7	1.2	8.3	9.8
N	657	823	738	908	508	648

TABLE 7.1.5. BREASTFEEDING AND NUTRITION AMONG CHILDREN AGED 6–23 MONTHS

Percentage of last-born children in past two years aged 6–23 months who are still breastfeeding, or given solid or semi-solid foods by type of food, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Are you still breastfeeding?	87.5	90.8	89.8	84.7	87.4	82.2
N	649	829	757	757	768	727
Are you giving the child soft or semi-solid food?	83.7	90.0	87.5	91.8	87.0	88.7
N	671	859	787	766	819	753
How many times did the child eat solid or semi-solid food yesterday?						
No times	0.5	0.1	1.2	1.2	0.4	2.1
1 time	4.5	1.7	8.8	6.9	8.3	4.7
2 times	23.8	14.2	29.0	23.0	28.9	18.2
3+ times	66.6	79.5	53.2	62.6	57.8	70.3
Don't know	4.7	4.5	7.9	6.4	4.6	4.7
Did the child eat any of these yesterday?						
Milk, cheese, yoghurt, other dairy?	48.2	34.2	52.8	43.3	57.0	57.5
Bread, rice, two, other grains?	84.5	88.4	88.1	88.6	83.8	85.9
Potato, other roots or tubers?	20.7	33.2	16.2	10.4	27.2	24.6
Pumpkin squash or similar food?	11.0	12.0	7.6	9.8	13.1	23.9
Dark or leafy vegetables?	43.1	34.2	26.0	14.1	25.3	21.8
Mango, pawpaw or vitamin A fruits?	9.3	6.8	5.5	3.3	11.1	13.4
Any other vegetables?	27.9	22.4	17.6	7.2	26.0	16.4
Eggs?	20.2	13.5	19.0	8.3	28.3	18.9
Meat, poultry, fish?	38.2	34.0	28.4	22.2	42.9	28.1
Bean food, peas, lentils?	47.2	38.5	29.9	41.7	57.4	36.3
Any oil, fats, butter, or foods made with these?	50.9	17.2	33.6	13.2	50.3	20.9
Dates, sweets, biscuits?	42.6	22.4	46.2	25.8	56.5	35.9
N	551	767	681	702	713	673

7.2 Breastfeeding ideations

TABLE 7.2.1. PERCEIVED BENEFITS OF EXCLUSIVE BREASTFEEDING FOR THE MOTHER

Percentage of women aged 15 to 49 years with a child under 2 years who report breastfeeding benefits for the mother by perceived benefit, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
BENEFIT TO MOTHER OF EXCLUSIVE BREASTFEEDING	%	%	%	%	%	%
None	33.5	16.9	20.2	18.6	21.9	21.6
Free/no cost	12.3	23.5	12.3	4.4	16.2	9.3
Convenient	11.2	35.6	15.9	12.0	26.9	36.1
Promotes bonding with infant	7.8	28.8	28.4	8.6	36.6	32.2
Promotes weight loss	2.4	8.8	5.9	2.2	17.2	12.6
Reduce blood postdelivery	1.2	7.7	6.1	2.5	16.3	6.8
Pain relief after birth	2.3	7.2	6.4	3.8	12.3	8.1
Promote maternal health	4.3	7.4	8.6	7.8	13.0	8.4
Improve emotional well-being	6.7	9.6	6.8	7.0	11.3	9.6
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 7.2.2. PERCEIVED BENEFITS OF EXCLUSIVE BREASTFEEDING FOR THE BABY

Percentage of women aged 15 to 49 years with a child under 2 years who report breastfeeding benefits for the baby by perceived benefit, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
BENEFIT TO BABY	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Good nutrition	5.5	49.1	5.2	22.6	2.8	55.4
Prevents illness	1.0	35.0	3.5	17.5	2.4	44.0
Promotes long-term health	0.3	19.6	0.9	10.6	2.1	21.7
Promotes bonding with mother	0.5	20.4	0.9	7.9	0.6	15.8
Leads to weight gain	0.1	19.2	1.1	14.1	0.7	10.2
Leads to higher IQ	0.4	12.7	0.4	5.6	2.1	15.5
N	892	1,088	1078	1,045	1069	1,011

TABLE 7.2.3. BREASTFEEDING KNOWLEDGE, BELIEFS, INTENTIONS, AND SELF-EFFICACY

Percentage of women aged 15 to 49 years with a child under 2 years with breastfeeding knowledge, beliefs, intentions, and self-efficacy, by baseline or endline rounds

IN YOUR OPINION, HOW LONG SHOULD A WOMAN BREASTFEED HER CHILD?	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Less than six months	2.6	0.1	1.1	0.0	2.0	0.0
6–11 months	1.7	2.8	7.2	0.1	5.3	0.9
12–23 months	63.8	80.9	66.8	83.5	66.2	81.8
24 months or more (correct response)	30.2	15.6	23.8	16.0	19.0	16.0
Other	1.4	0.3	1.1	0.1	6.2	1.4
Don't know	0.4	0.3	0.1	0.3	1.3	0.0
N	892	1,083	1,078	1,032	1,069	986

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

TABLE 7.2.4. BREASTFEEDING KNOWLEDGE, BELIEFS, INTENTIONS, AND SELF-EFFICACY

Percentage of women aged 15 to 49 years with a child under 2 years with breastfeeding knowledge, beliefs, intentions, and self-efficacy, by baseline or endline rounds

	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Breastmilk contains essential nutrients for first 6 months of life	79.4	87.1	88.3	89.7	6.2	7.8
Mother's breastmilk after birth is bad milk	28.8	17.1	19.0	19.1	-11.8	-13.6
Likelihood you would exclusively breastfeed next child for first 6 months	45.8	49.3	59.6	68.0	-4.8	0.6
Most women in my community only give infants breastmilk	29.9	36.2	49.5	67.1	-11.3	-7.3
Important for mothers to only give child breastmilk in first 6 months	48.9	63.7	70.1	78.4	6.5	9.5
Confident to exclusively breastfeed your child for the first 6 months	39.2	43.7	64.6	69.9	-0.9	3.8
Confident to start conversation with husband about breastfeeding child	60.3	58.9	74.9	80.6	-7.1	-3.7
N	892	1,083	1,069	986		

*** p<.001, **p<.01, * p<.05

TABLE 7.2.5. BREASTFEEDING KNOWLEDGE, BELIEFS, INTENTIONS, AND SELF-EFFICACY

Percentage of women aged 15 to 49 years with a child under 2 years with breastfeeding knowledge, beliefs, intentions, and self-efficacy, by baseline or endline rounds

	SOKOTO		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Breastmilk contains essential nutrients for first 6 months of life	85.0	90.1	88.3	89.7	3.7	5.4
Mother's breastmilk after birth is bad milk	29.0	31.9	19.0	19.1	2.8	1.6
Likelihood you would exclusively breastfeed next child for first 6 months	46.3	49.7	59.6	68.0	-4.9	-2.4
Most women in my community only give infants breastmilk	29.3	30.5	49.5	67.1	-16.4	-12.0
Important for mothers to only give child breastmilk in first 6 months	53.9	61.5	70.1	78.4	-0.7	2.6
Confidence to exclusively breastfeed your child for the first 6 months	43.8	44.1	64.6	69.9	-5.0	-1.8
Confidence to start conversation with husband about breastfeeding child	62.1	57.1	74.9	80.6	-10.7	-7.5
N	1,078	1,032	1,069	986		

*** p<.001, **p<.01, * p<.05

TABLE 7.2.6. WHO ELSE INFLUENCES DECISIONS ABOUT BREASTFEEDING?

Percentage of women aged 15 to 49 years who are currently pregnant or with a child under 2 years who report influencers on a woman's decisions about breastfeeding, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
INFLUENCER	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
No one else	30.4	9.2	36.1	19.9	35.2	23.0
Partner	64.6	87.0	55.2	72.9	59.9	72.2
Mother in-law	6.9	19.4	15.0	12.9	4.4	4.3
Mother	7.0	10.8	8.2	3.6	6.4	3.6
Other own family	0.5	0.4	1.3	0.7	0.7	1.4
Other partner family	0.4	0.4	0.8	1.1	0.9	1.1
Friends	0.2	0.4	0.6	0.7	2.8	1.2
Health provider	2.3	3.0	3.0	0.5	7.2	3.5
Religious/community leader	0.6	0.1	0.2	0.6	0.3	0.1
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 7.2.7. WHAT ARE SOME WAYS TO RECOGNIZE POOR NUTRITION IN A CHILD?

Percentage of women aged 15 to 49 years with a child under 2 years who report ways of recognizing poor nutrition in a child by symptom, by baseline and endline rounds

SIGN	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Lack of energy	40.8	58.3	38.1	39.8	46.7	58.1
Trouble paying attention	27.6	25.1	17.6	9.2	25.1	33.4
Trouble learning	15.8	15.9	9.2	8.5	18.4	28.5
Irritability	25.7	13.5	8.8	5.4	15.0	9.5
Becomes ill easily	34.6	32.2	23.3	8.3	25.8	18.8
Weakness	29.3	33.3	25.1	23.9	36.2	34.3
Dry/scaly skin	10.1	25.3	19.0	24.7	23.8	20.6
Longer time to healing for wounds	4.8	14.7	5.0	2.0	8.0	5.0
Stunted growth	24.1	40.3	34.4	27.9	36.4	36.9
Thin arms and legs	20.5	34.3	29.5	19.7	34.1	23.3
Visible ribs	14.3	38.4	28.7	13.2	33.5	29.3
N	892	1,088	1,078	1,045	1,069	1,011

Chapter 8. Child health

8.1 Vaccination

Key findings

Overall, in spite of small increases in vaccination rates from baseline to endline, vaccination coverage remained low in all three states (Tables 8.1.1, 8.1.2). Relative to baseline in Kebbi (4%), Sokoto (5%) and Zamfara (8%) only 9%, 4% and 15% of children 12–23 months had received all basic vaccinations (BCG, measles, DPT3, polio3) in Kebbi, Sokoto and Zamfara respectively before the endline survey interview.

According to women in Kebbi, spousal opposition as a reason for not vaccinating a child increased in importance, from 30% at baseline to 54% at endline. Increases were also evident in Sokoto (34% at baseline, 45% at endline) and in Zamfara (33% at baseline, 47% at endline). Fear of side effects also grew in importance as a reason for not vaccinating, from 20% to 34% in Kebbi, from 17% to 37% in Sokoto, and from 4% to 16% in Zamfara (Table 8.1.3).

An increasing majority of women across Kebbi (73% at baseline, 93% at endline), Sokoto (74% at baseline, 84% at endline) and Zamfara (73% at baseline, 82% at endline) said that the decision to vaccinate a child was influenced by her spouse. Considering that male spouses were the top barriers and also top influencers for childhood vaccination, this reinforces the importance of targeting spousal opposition and engaging men (Table 8.1.4).

Women in all three states showed positive changes in attitudes and behaviors toward vaccines and immunization services when adjusted for other influences (Tables 8.1.6, 8.1.7). However, the areas of greatest improvement varied between states. Kebbi showed stronger improvements in vaccine perceptions and knowledge of vaccination logistics. Sokoto demonstrated significant progress in vaccine perceptions, knowledge of logistics, and trust in health workers. Meanwhile, Zamfara displayed stronger improvements in attitudes related to the ease and reliability of accessing vaccination services.

Looking at the adjusted DID estimates, significant improvements were observed in Kebbi relative to Zamfara, particularly in attitudes toward the effectiveness of childhood vaccines and the severity of illnesses that vaccines prevent. These improvements, shown as a 7.1 percentage point increase in both adjusted DID estimates, indicate a more positive perception toward vaccines among women in Kebbi. Also notable was the increase in knowledge about where and when to get a child vaccinated, with an adjusted DID estimate showing an increase of 5.9 percentage points. Conversely, the state saw a decline in certain areas, such as the ease for mothers to track their child's immunizations and the availability of vaccines at local health facilities.

In Sokoto, there were increases in the adjusted DID estimates for the belief in vaccine effectiveness (3.0 percentage points), knowledge about vaccination logistics (4.7 percentage points), and trust in health workers (7.0 percentage points). Additionally, there was an increase in the likelihood of getting the next child fully vaccinated (4.3 percentage points), reflecting an overall positive change in vaccination behaviors in Sokoto. However, Sokoto showed smaller improvements in attitudes relating to the ease and reliability of accessing vaccination services.

Finally, Zamfara demonstrated significant improvements in terms of access to and convenience of vaccination services. The adjusted DID estimates showed increases for beliefs that it is easy for mothers to take their child for vaccinations (-3.9 percentage points), to track their child's immunizations (-7.8 percentage points), and that health facilities often have vaccines available (-4.1 percentage points). However, improvements in other areas, such as the perception of vaccine effectiveness and trust in health workers, were less pronounced in Zamfara compared to Kebbi and Sokoto.

TABLE 8.1.1 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, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Has the child ever received any immunizations?	48.9	38.2	38.3	34.1	39.7	39.5
N	482	575	548	485	578	550
Do you have a card where child vaccinations are written down?						
Yes, only has a card	56.0	44.6	39.3	40.5	58.8	75.8
Yes, has only another document	2.8	0.0	0.0	0.0	2.1	1.0
Yes, has card and other document	1.3	1.9	4.7	2.0	1.7	2.8
No, has no card and no other document	39.8	53.5	56.0	57.5	37.4	20.4
N	240	231	221	181	219	215

TABLE 8.1.2 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	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
(Derived) BCG coverage	32.8	33.1	21.9	24.2	27.8	38.4
(Derived) DPT1 coverage	19.4	23.9	18.1	16.4	23.4	29.1
(Derived) DPT2 coverage	10.8	18.8	14.4	12.8	15.9	24.0
(Derived) DPT3 coverage	5.7	12.2	9.6	6.5	10.7	18.1
(Derived) Polio1 coverage	37.7	34.3	31.1	29.7	34.3	37.4
(Derived) Polio2 coverage	35.9	32.0	27.8	25.2	32.7	34.5
(Derived) Polio3 coverage	28.9	27.6	20.9	18.3	28.1	30.1
(Derived) Measles1 coverage	15.9	18.9	16.5	12.0	19.2	22.5
(Derived). All basic vaccinations (BCG, Measles1, DPT3, Polio3)	3.7	9.4	4.5	4.2	7.7	15.3
N	482	575	548	485	578	550

TABLE 8.1.3. REASONS FOR NOT VACCINATING A CHILD

Percentage of women with a child under 2 years who reported specific reasons why a mother in her community may not get her child vaccinated, by baseline and endline rounds

WHY NOT GET CHILD VACCINATED?	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Too expensive	7.3	5.7	8.6	3.8	3.9	4.1
Facility closed	10.5	6.4	3.2	6.8	11.3	3.1
Distance/transport not available	9.8	18.3	9.9	9.5	17.0	6.4
No female provider	1.6	2.2	3.0	0.1	4.8	0.3
Vaccine often not available	10.2	9.9	6.8	2.4	7.5	2.3
Disrespectful provider	1.5	7.0	2.0	1.0	0.7	0.7
Poor quality service	4.2	3.0	3.0	1.8	3.6	2.5
Vaccines not effective	3.8	5.6	3.3	7.2	0.4	5.9
Vaccines not safe/fear side effects	20.0	33.6	16.5	36.5	4.2	15.9
Fear needles	6.9	24.1	9.2	17.7	13.7	19.8
Husband/partner oppose	30.1	53.7	33.7	45.0	33.4	46.5
Religious/community leaders oppose	1.3	7.3	1.1	4.3	0.6	1.6
Don't know where to go	4.9	3.9	3.6	4.4	2.1	2.3
N	476	658	662	658	656	606

TABLE 8.1.4. WHO ELSE INFLUENCES DECISIONS ABOUT GETTING A CHILD VACCINATED?

Percentage of pregnant women and women with a child under 2 years reporting who influences decisions to vaccinate a child, by baseline and endline rounds

INFLUENCER	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
No one else	24.0	5.2	20.6	11.5	21.9	14.3
Husband/partner	73.0	93.3	73.5	84.2	72.8	81.8
Mother-in-law	7.5	17.4	16.3	9.9	4.5	3.7
Mother	5.8	11.1	5.3	3.4	6.2	2.3
Other own family	0.3	0.3	0.7	0.5	1.0	0.3
Other partner family	0.1	0.2	0.7	0.7	0.9	0.9
Friends	0.7	0.7	1.1	0.3	3.9	1.1
Health provider	2.7	1.5	4.2	0.5	6.1	3.1
Community/religious leader	0.7	2.3	1.2	1.4	1.5	0.3
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 8.1.5. VACCINE KNOWLEDGE, PERCEPTIONS, SELF-EFFICACY, AND INTENTIONS

Percentage of pregnant women and women with a child under 2 years reporting specific knowledge, perceptions, self-efficacy, and intentions for child vaccinations, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Before 12 months, how many times should a child be vaccinated?						
No times	5.4	0.3	3.6	7.3	6.0	5.8
1–5 times	15.0	41.6	16.8	33.2	18.3	35.1
6–10 times	2.0	11.3	7.7	8.9	14.0	21.5
11 +times	1.7	0.1	0.1	0.3	0.7	0.9
Don't know	75.9	46.8	71.9	50.3	61.0	36.7
At what age should a child receive first vaccination?						
At birth	24.6	43.1	11.8	18.9	29.6	33.5
Before naming ceremony	12.4	14.5	12.0	12.6	9.7	14.3
After naming ceremony but before coming out	9.7	12.6	15.3	24.1	10.7	18.2
At coming out/6 weeks	6.2	4.3	2.5	4.6	1.9	3.6
3 months	4.7	5.9	3.7	3.8	1.5	1.3
After one year	0.8	0.6	0.9	2.1	0.6	0.7
Other	0.9	0.5	1.2	6.3	1.4	2.9
Don't know	40.8	18.6	52.8	27.6	44.6	25.6
N	892	1,083	1078	1032	1,069	986

TABLE 8.1.6 VACCINE KNOWLEDGE, PERCEPTIONS, SELF-EFFICACY, AND INTENTIONS

Percentage of pregnant women and women with a child under 2 years reporting specific knowledge, perceptions, self-efficacy, and intentions for child vaccinations, by baseline and endline rounds

	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
In your opinion, how effective are childhood vaccines?	73.6	85.1	72.6	80.7	3.4	7.1
Many illnesses vaccines prevent are severe	70.3	77.9	71.1	75.3	3.4	7.1
I know where and when to get a child vaccinated	64.2	77.0	75.6	84.0	4.3	5.9
It is easy for mothers to take their child for vaccinations	53.1	64.6	66.3	87.8	-10.0	-7.2
It is easy for mothers to track their child's immunizations	46.6	57.5	62.1	86.0	-13.0	-11.0
Vaccines have chemicals that can be dangerous to child health	34.4	20.8	23.1	25.9	-16.5	-16.7
Most people in the community trust immunization health workers	75.5	81.7	80.1	91.9	-1.4	-5.8
Health facilities in the community often have vaccines available	57.8	68.2	60.6	86.9	-16.0	-13.0
Most parents take their child to a health facility for immunizations	48.2	63.6	65.8	82.7	-1.4	1.0
Likelihood to get next child fully vaccinated	78.4	79.8	78.4	78.3	1.5	2.8
N	892	1,083	1,069	986		

*** p<.001, **p<.01, * p<.05

TABLE 8.1.7. VACCINE KNOWLEDGE, PERCEPTIONS, SELF-EFFICACY, AND INTENTIONS

Percentage of pregnant women and women with a child under 2 years reporting specific knowledge, perceptions, self-efficacy, and intentions for child vaccinations, by baseline and endline rounds

	SOKOTO		ZAMFARA		UN ADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
In your opinion, how effective are childhood vaccines?	67.5	75.1	72.6	80.7	-0.6	3.0
Many illnesses vaccines prevent are severe	68.9	72.7	71.1	75.3	-0.3	2.5
I know where and when to get a child vaccinated	63.6	72.9	75.6	84.0	0.9	4.7
It is easy for mothers to take their child for vaccinations	45.2	57.8	66.3	87.8	-8.9	-3.9
It is easy for mothers to track their child's immunizations	38.3	48.8	62.1	86.0	-13.4	-7.8
Vaccines have chemicals that can be dangerous to child health	26.0	29.4	23.1	25.9	0.6	-0.9
Most people in the community trust immunization health workers	60.7	75.5	80.1	91.9	3.0	7.0
Health facilities in the community often have vaccines available	47.7	64.7	60.6	86.9	-9.4	-4.1
Most parents take their child to a health facility for immunizations	45.9	62.2	65.8	82.7	-0.6	5.2
Likelihood to get next child fully vaccinated	68.5	69.3	78.4	78.3	0.9	4.3
N	1078	1032	1,069	986		

*** p<.001, **p<.01, * p<.05

8.2 Acute respiratory infections

Key findings

Care-seeking and treatment: At endline, among last-born children in the past two years, 8% in Kebbi, 4% in Sokoto and 4% in Zamfara were reported to have had an ARI (i.e., cough, rapid breaths, and a chest-related problem) in the past two weeks, a small decline from baseline prevalence in Sokoto (8%) and Zamfara (7%) but not Kebbi (5%) (Table 8.2.1). Among these children, rates of care-seeking from any medical source were high and remained similar between baseline (Kebbi: 87%, Sokoto: 70%, Zamfara: 81%)) and endline (Kebbi: 85%, Sokoto: 85%, Zamfara: 84%) (Table 8.2.2).

There was an increase in the percentage of children with symptoms of ARI that were taken for formal care in Sokoto (42% at baseline, 50% at endline) and Zamfara (28% at baseline, 32% at endline) but a decrease in Kebbi (39% at baseline, 28% at endline). The decline in Kebbi was offset by increased use of informal providers (48% at baseline, 57% at endline) but also a slight increase in the percentage of children with symptoms of ARI not being taken for any care (13% at baseline, 15% at endline) (Table 8.2.2). These changes could be reflective of the events that occurred during the COVID-19 pandemic. Nonetheless, there was a large increase in the percentage of children with ARI symptoms who received antibiotics in Kebbi (41% at baseline, 63% at endline), a smaller increase in Sokoto (26% at baseline, 38% at endline), and a sharp decrease in Zamfara (53% at baseline, 28% at endline), indicating that many children with ARI symptoms are still not treated with antibiotics (although the appropriateness of antibiotic treatment for these reported respiratory symptoms is unclear since we do not know with certainty if it has a bacterial etiology) (Table 8.2.3).

Reasons for source of care or not seeking any care: The most important reasons for choosing the source of care in Kebbi were proximity to a location (47% at baseline; 47% at endline), trust in provider (33% at baseline; 53% at endline), short wait time (26% at baseline; 13% at endline), and effective treatment (20% at baseline, 50% at endline) (Table 8.2.4). In Sokoto, they were proximity to a location (44% at baseline, 47% at endline), trust in provider (24% at baseline, 23% at endline) effective

treatment (18% at baseline, 23% at endline) and short wait time (8% at baseline, 16% at endline). In Zamfara, trust in provider (45% at baseline, 57% at endline) was the leading reason for choice of care, other important reasons were effective treatment (27% at baseline, 27% at endline), respectful care (9% at baseline, 23% at endline) and short wait time (11% at baseline, 16% at endline)

At endline, cost considerations ("costs too much") rose in importance as a reason for not seeking care only in Zamfara, doubling from 20% at baseline to 44% at endline. Perceptions that symptoms were not severe or that home care was provided were also cited mostly in Kebbi (25% at baseline, 53% at endline) and Sokoto (10% at baseline; 20% at endline) (Table 8.2.5).

These results point to the importance to respondents of convenient, trusted, and high-quality health services in their communities as a complement to SBC activities.

Pneumonia ideations: Pediatric pneumonia knowledge remains low. As at baseline, only 38% of respondents in Sokoto and 36% in Zamfara respectively with a child under 2 years at endline reported rapid or difficult breathing as a sign or symptom of pediatric pneumonia (Table 6.3.6). Knowledge of rapid or difficult breathing as a sign or symptom increased by approximately two-fold in Kebbi (28% at baseline, 52% at endline).

On the positive side, there were notable increases in the recognition of the importance of antibiotics for treating pneumonia and declines in all three states in the percentage of respondents who were unable to report any effective medicine. The percentage of women identifying any antibiotic increased from 32% to 70% in Kebbi, from 20% to 31% in Sokoto, and from 35% to 43% in Zamfara. Meanwhile, the percentage who could not identify any effective medicine fell from 58% to 19% in Kebbi, from 65% to 47% in Sokoto, and from 56% to 26% in Zamfara.

In Kebbi, there were strong improvements in most ideational factors related to knowledge and treatment intentions for ARI, although many of these were mirrored to some extent in Zamfara (Table 8.2.9). For example, risk perceptions, as measured by agreement with the statement that a child can get severely ill from pneumonia, increased by 16 pp from 79% at baseline to 95% at endline in Kebbi, as compared with an increase of 13 pp from 72% to 85% in Zamfara. This yielded an adjusted DID estimate of 5 pp, which was not statistically significant. Similarly, awareness that antibiotics are the most effective treatment for pneumonia increased by 18 pp from 63% to 81% in Kebbi, as compared with an 11-pp change from 62% to 73% in Zamfara. The adjusted DID estimate was a sizable 11 pp, although this was not statistically significant. Belief in myths or sub-optimal treatments decreased in Kebbi relative to Zamfara as evidenced in adjusted DID estimates of -6 pp for belief in the myth that only week children die of pneumonia and of -9 pp for the descriptive norm that most women go to traditional providers for pneumonia symptoms.

Sokoto also showed improvements in several ideational factors related to knowledge and treatment intentions for ARI, including a 15-pp increase in the risk perception that children can get severely ill from pneumonia and 10 pp decrease in belief in the myth that only weak children die of pneumonia (Table 8.2.10). This yielded adjusted DID estimates of 4 pp and 18 pp respectively, although only the latter was statistically significant.

Intentions to complete the full antibiotic course for pneumonia symptoms increased in all three states from baseline to endline, from 80% to 94% in Kebbi, from 74% to 82% in Sokoto, and from 82% to 94% in Zamfara. Intentions to seek care the same or next day for pneumonia symptoms also increased in all three states. However, none of the adjusted DID estimates for the intention's indicators were statistically significant.

Most women expressed confidence in their ability to convince their husbands to seek care for a child exhibiting pneumonia symptoms—95% in Kebbi, 85% in Sokoto, and 97% in Zamfara.

TABLE 8.2.1. ARI SYMPTOMS

Percentage of last-born children under 2 years with ARI symptoms in past 2 weeks, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Has the child had cough, rapid breaths, and chest issue in past 2 weeks?	5.1	8.0	8.1	3.7	6.9	3.8
N	887	1,083	1,077	1,032	1,069	985
Did the child have a cough in the past two weeks?	15.3	27.3	23.3	25.2	22.6	23.7
N	892	1,083	1,078	1,032	1,069	986
Has the child had cough with rapid breaths in past 2 weeks?	7.6	14.2	14.4	9.9	11.9	9.4
N	879	1,081	1,064	1,031	1,064	986
Did the child have short, rapid breaths or difficulty breathing?	49.2	51.9	61.1	39.2	52.2	39.7
N	138	284	245	261	256	241
Was this a problem in the chest or a blocked/runny nose?						
Chest only	12.3	9.4	14.1	8.9	14.9	15.7
Nose only	32.3	43.8	42.0	60.3	42.0	58.3
Both chest and nose	55.4	46.9	42.8	28.6	43.1	25.0
Other	0.0	0.0	0.5	0.0	0.0	1.0
Don't know	0.0	0.0	0.5	2.2	0.0	0.0
N	69	157	151	101	131	103

TABLE 8.2.2. ARI CARE-SEEKING BY SOURCE

Percentage of last-born children under 2 years with ARI in the past two weeks who was taken to any care by source, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Did you seek advice or treatment?	87.4	84.7	70.3	84.5	88.1	83.6
Source of care for respiratory symptoms						
None	12.6	15.3	29.7	15.5	19.4	16.0
Informal	48.1	56.6	28.2	34.9	52.5	51.8
Formal	39.3	28.1	42.1	49.6	28.1	32.2
N	69	157	149	99	131	103
Where did you seek care?						
Government hospital	19.4	18.6	7.7	4.5	11.9	16.4
Government PHC	10.6	9.9	30.4	37.8	19.1	17.2
Dispensary/health post	2.6	2.4	6.4	11.0	1.8	3.0
Community health outreach post	6.3	1.5	5.6	0.0	0.9	1.7
Nursing/maternity home	1.6	0.0	0.0	0.0	1.6	0.0
Private hospital/clinic	6.2	0.8	7.7	3.8	1.7	0.0
PPMV/pharmacy/community pharmacy/drug shop/ chemist	51.7	66.8	35.1	37.9	60.9	62.5
Total	60	134	107	86	104	85

TABLE 8.2.3. ARI TREATMENT BY MEDICATION TYPE

Percentage of last-born children under 2 years with ARI in the past two weeks who were given antibiotics to treat the condition, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
At any time during illness did the child take any medicines for the illness?	93.4	92.7	80.7	87.5	85.6	80.9
N	69	157	151	101	131	103
What medicine taken?						
Antibiotic drugs: pills/syrup	41.0	61.6	24.2	35.2	51.3	23.8
Antibiotic drugs: IV/Injection	1.6	1.7	1.4	7.1	5.1	4.6
Any antibiotic	41.0	63.4	25.6	38.0	52.6	28.3
N	63	144	123	88	113	85

TABLE 8.2.4. REASONS FOR CHOOSING SOURCE OF CARE FOR ARI

Percentage of last-born children under 2 years with ARI in the past two weeks who were taken to care by reason for treatment location, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
REASON FOR CHOICE OF TREATMENT PLACE?	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Free or inexpensive	10.0	2.6	27.6	2.1	8.7	14.4
Nearby/transport available	47.4	47.4	43.8	47.4	35.6	15.7
Medicines often in stock	7.9	13.0	4.8	3.9	6.8	3.1
Respectful care	1.6	10.3	3.8	11.5	8.5	23.3
Trust to care for child	32.5	52.5	24.0	22.5	44.7	57.1
Effective treatment	20.0	49.8	18.4	22.6	26.9	26.7
Short wait time	26.4	13.3	7.7	15.8	11.4	15.9
Privacy	1.6	0.0	2.7	0.0	0.0	0.0
Family/friends recommend	13.0	13.9	9.5	11.7	35.0	3.5
Religious/community leaders	2.4	0.0	0.0	0.0	0.0	1.9
Total	60	134	107	86	104	85

TABLE 8.2.5. REASONS FOR NOT SEEKING CARE FOR ARI

Percentage of last-born children under 2 years with ARI in the past two weeks not taken to care by reason for no care-seeking, by baseline and endline rounds

REASON FOR NOT SEEKING CARE?	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Costs too much	34.5	28.6	50.3	30.0	20.1	44.4
Facility closed	0.0	3.9	1.2	0.0	11.1	3.0
Transport difficulties	9.1	7.7	0.0	12.2	0.0	12.2
Medicine often not available	20.5	3.9	0.0	0.0	0.0	3.0
Poor quality service	0.0	0.0	0.0	0.0	0.0	0.0
Treatment not effective	10.2	0.0	2.8	0.0	3.8	0.0
Symptoms not severe/home care	25.4	53.2	10.0	19.8	32.9	0.0
Spouse opposes	0.0	29.3	8.2	43.5	6.7	31.1
Unable to leave work/home	0.0	10.3	0.0	5.0	1.0	0.0
Up to God	14.4	11.6	28.4	6.2	18.1	38.7
Total	9	23	44	15	27	18

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

TABLE 8.2.6. 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, by baseline and endline rounds

SYMPTOMS OF PNEUMONIA?	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Fever	30.7	54.6	26.2	27.8	32.9	42.8
Chills	17.8	20.5	12.6	9.8	10.5	15.6
Headache	15.9	27.0	14.2	9.3	19.2	19.1
Body pain	14.3	24.8	12.7	10.7	16.7	19.8
Stiff neck	5.9	9.8	2.4	2.9	5.9	5.4
Wheezing	22.2	19.9	17.1	8.4	21.0	25.7
Cough	42.1	70.2	43.6	51.7	54.9	62.2
Rapid difficult breaths	28.1	52.2	32.7	37.5	35.4	36.2
Diarrhea	6.0	9.1	3.4	4.2	5.5	5.2
Vomiting	9.3	10.1	7.7	6.6	9.8	11.0
Poor appetite	5.8	10.5	4.6	6.1	7.7	5.6
Not able to eat	3.4	12.2	3.4	3.0	9.8	7.2
Tiredness	1.0	11.1	1.0	2.1	4.9	4.8
Restless	5.1	19.4	6.0	6.2	8.1	15.6
Bitter taste in mouth	1.1	7.9	0.7	0.3	4.9	2.6
Blisters in mouth	1.1	6.5	0.7	0.4	3.5	0.5
Convulsions	1.4	6.1	1.2	1.6	4.0	1.8
Unconscious	1.0	5.2	0.6	0.6	1.1	1.5
Dizziness	0.9	5.9	1.0	2.3	2.2	3.0
Crying all the time	3.3	20.8	6.3	4.9	11.0	18.7
Death	1.0	5.7	0.6	0.3	1.1	1.5
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 8.2.7. 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, by baseline and endline rounds

THINGS TO PREVENT PNEUMONIA?	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Ensure child vaccinated	27.4	24.7	26.4	15.8	30.6	16.4
Use toilet/no open waste	4.6	11.5	3.8	1.7	9.1	5.9
Keep house/surroundings clean	15.4	28.7	11.4	8.1	22.4	21.9
Only breastmilk first 6 months	6.5	5.3	6.1	2.7	14.4	2.4
Safe storage of drinking water	6.1	10.6	6.7	4.9	16.1	5.6
Don't give dirty water	4.2	11.5	5.2	10.7	9.5	6.2
Don't eat bad food	2.8	12.9	3.2	1.9	5.3	2.1
Good nutrition	12.6	16.3	8.2	6.9	11.3	6.6
Handwashing	5.8	9.0	3.8	5.5	6.0	5.0
Proper disposal of infant stool	2.2	5.6	2.6	2.5	4.4	3.6
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 8.2.8. 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, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Effective medicine to treat pneumonia?						
Amoxicillin	27.9	65.7	18.0	29.2	29.6	39.9
Cotrimoxazole	11.8	20.9	7.2	2.1	20.8	20.3
Other antibiotics	1.3	0.3	1.0	0.4	2.4	1.0
Identified any relevant antibiotic	32.0	70.0	20.4	31.3	35.0	43.3
Antimalarials	5.5	18.0	4.1	3.8	10.6	8.5
ORS	6.2	2.6	1.2	1.8	2.0	3.1
Other (specify)	2.9	8.8	12.9	17.0	6.9	4.8
Don't know	58.3	18.5	64.9	47.3	55.6	45.5
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 8.2.9. 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, by baseline and endline rounds

	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Child can get severely ill from pneumonia (hospitalized or death)	79.3	94.8	72.1	85.4	2.2	4.9
Only weak children die of pneumonia	56.3	55.7	53.8	60.3	-7.0	-6.4
Most women go to traditional provider for pneumonia symptoms	84.0	81.5	70.9	75.7	-7.2	-8.9
Antibiotics are most effective treatment for pneumonia	62.5	81.0	62.0	72.7	7.8	11.3
Likelihood to complete antibiotic course for pneumonia symptoms	80.1	94.2	82.2	94.0	2.3	3.4
Likelihood to seek care same/next day for pneumonia symptoms	87.7	95.3	89.0	96.1	0.5	0.9
Confidence to convince husband to seek care for pneumonia symptoms	85.6	94.6	91.7	96.8	4.0	4.2
N	892	1,083	1,064	986		

*** p<.001, **p<.01, * p<.05

TABLE 8.2.10. 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, by baseline and endline rounds

	SOKOTO		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Child can get severely ill from pneumonia (hospitalized or death)	72.0	86.9	72.1	85.4	1.7	3.7
Only weak children die of pneumonia	55.1	44.9	53.8	60.3	-16.7*	-18.0*
Most women go to traditional provider for pneumonia symptoms	74.0	75.9	70.9	75.7	-2.9	-4.1
Antibiotics are most effective treatment for pneumonia	50.8	55.9	62.0	72.7	-5.6	-4.2
Likelihood to complete antibiotic course for pneumonia symptoms	73.9	81.7	82.2	94.0	-4.0	-2.2
Likelihood to seek care same/next day for pneumonia symptoms	78.3	83.9	89.0	96.1	-1.5	-0.2
Confidence to convince husband to seek care for pneumonia symptoms	84.8	84.8	91.7	96.8	-5.0	-3.9
N	1,074	1,032	1,061	986		

*** p<.001, **p<.01, * p<.05

8.3 Diarrheal diseases

Key findings

Diarrhea prevalence and care-seeking: At endline, there was a slight uptick in the prevalence of diarrhea in the past two weeks among last-born children in both Kebbi (17% at baseline and 21% at endline) and Sokoto (21% at baseline, 26% at endline), but not in Zamfara (16% at both baseline and endline (Table 8.3.1). Care was sought for approximately three-quarters of children with diarrhea; however, between baseline and endline there was a significant increase in care-seeking from informal private sources such as pharmacies and drug shops in all three states, from 28% to 57% in Kebbi, from 24% to 40% in Sokoto, and from 44% to 56% in Zamfara. This may indicate poor-quality care provision for treatment for diarrhea due to the lack of zinc and ORS commodities and knowledge of appropriate diarrhea treatment protocols at informal providers. This coincided with a large decline in the utilization of formal sector care in Kebbi, dropping from 45% at baseline to only 21% at endline. Sokoto and Zamfara experienced much smaller declines in formal sector care.

Reasons for source of care or not seeking any care: Among respondents with a child under two years who had diarrhea in the past two weeks and who sought any care, stated reasons for choosing the treatment location were similar to those at baseline and point to the importance of convenient, trusted, and high-quality care provision among respondents (Table 8.3.2). Notably, these factors increased in importance in Kebbi. The percentage of respondents who cited "effective treatment" increased nearly five-fold, from 11% to 52%, while trust in the provider to care for the sick child increased from 29% to 55%. These sizable increases were not matched in Sokoto nor Zamfara. The most important reasons for not seeking care were that symptoms were not perceived as severe or that care was provided at home (55% in Kebbi, 32% in Sokoto, and 47% in Zamfara) and fatalism ("It's up to God") (14% in Kebbi, 36% in Sokoto, and 36% in Zamfara) (Table 8.3.3). Cost considerations declined in importance in all three states but was still cited by 26% of respondents in Kebbi, 11% in Sokoto, and 9% in Zamfara. Findings around reasons for choosing to not seek care need to be interpreted cautiously given the small sample sizes of children by state and by survey who had diarrhea and for whom care was not sought.[j]

Diarrhea treatment: A greater percentage of children with diarrhea were given appropriate treatment at endline relative to baseline in Kebbi and Sokoto, but still only a minority of children received appropriate treatment in any of the states (Table 8.3.4). The percentage of children given ORS and zinc together, the gold-standard for treating diarrhea, increased from 16% to 30% in Kebbi and from 12% to 22% in Sokoto, but fell slightly in Zamfara from 27% to 23%. As at the baseline, antibiotics were commonly given to treat diarrhea—38% in Kebbi, 26% in Sokoto, and 38% in Zamfara, despite their lack of indication for most diarrhea-causing pathogens.

Diarrhea ideations: Diarrhea treatment knowledge improved substantially between baseline and endline in Kebbi and Sokoto relative to Zamfara (Table 8.3.6). Knowledge of zinc as effective treatment increased from 38% to 68% in Kebbi and from 22% to 42% in Sokoto, but by slightly less in Zamfara, from 50% to 65%. Awareness of ORS as effective treatment also increased in Kebbi, from 61% to 80%, and in Sokoto, from 44% to 70%, but fell slightly in Zamfara, from 83% to 76%.

At endline, respondents in Kebbi showed much greater improvements in knowledge of the correct mechanisms through which ORS helps a child with diarrhea relative to both Sokoto and Zamfara (Table 6.5.7). Awareness that ORS helps to treat dehydration caused by diarrhea increased from 25% to 48% in Kebbi but remained unchanged in both Sokoto (11% at baseline, 12% at endline) and Zamfara (39% at both baseline and endline). A similar pattern was evident with awareness that ORS helps to replace lost salt and electrolytes, which increased from 13% to 32% in Kebbi but fell slightly in Sokoto (from 8% to 4%) and Zamfara (27% to 22%).

Respondents were somewhat less knowledgeable about how zinc helps a child with diarrhea, and again improvements in awareness that zinc makes diarrhea less severe, shortens the duration of diarrhea episodes, and prevents dehydration were predominantly in Kebbi (Table 8.3.8).

As in the baseline, levels of perceived susceptibility and severity of diarrhea among under-twos were relatively high (Table 8.3.9, 8.3.10). More than three-quarters of women in Kebbi and Zamfara reported that it was common for children in the community to get diarrhea, and nearly all women in all three states knew that diarrhea could lead to dehydration and death. Again, improvements in this indicator were largest in Kebbi, where it increased by 12 pp (from 85% to 97%), relative

[j]For example, at endline in Zamfara, only 30 of 162 children (18%) were not taken for care.

to Sokoto, where it increased by 3 pp from 88% to 91%, and Zamfara, where it decreased by 4 pp from 94% to 90%. By endline, most women in Kebbi, Sokoto, and Zamfara stated that, for the next case of diarrhea in a child, they would be likely to continue breastfeeding, to provide ORS, and to provide zinc.

TABLE 8.3.1. DIARRHEA PREVALENCE AND CARE-SEEKING FOR PEDIATRIC DIARRHEA

Percentage of last-born children under 2 years with diarrhea in the past two weeks and source of care, by baseline or endline rounds

SOURCE	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Diarrhea in past two weeks	17.2	20.8	20.6	26.0	15.6	15.5
N	892	1083	1078	1032	1069	986
Type of care						
No care	26.8	22.6	39.9	25.8	25.8	18.1
Informal care	28.2	56.5	24.1	40.4	44.2	54.6
Formal care	45.0	20.9	35.9	33.8	30.0	27.3
Source of care						
Government hospital	32.1	12.5	7.7	5.5	21.0	9.4
Government PHC	20.8	8.4	29.7	28.5	11.7	20.5
Dispensary/health post	1.6	2.2	11.2	8.7	3.1	1.3
Comm health outreach	5.1	1.8	3.6	0.0	1.4	1.9
Private hospital/clinic	2.6	1.4	5.9	2.4	3.3	0.5
Pharmacy/chemist/drug shop	36.8	75.4	31.5	53.5	55.5	67.6
N	153	157	210	201	171	132

Note that the respondent was not prompted about the type of facility attended. The interviewer is trained to code any secondary level government (or general) hospital mentioned as "government hospital."

TABLE 8.3.2. REASONS FOR CHOOSING SOURCE OF CARE FOR PEDIATRIC DIARRHEA

Percentage of last-born children under 2 years with diarrhea in the past two weeks taken to any source of care by reason for choosing treatment location, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Free or inexpensive care	16.1	5.6	22.9	3.5	6.1	7.7
Nearby/transport available	37.5	48.0	40.6	35.5	21.8	21.4
Medicines often in stock	11.0	7.5	13.5	5.3	4.8	2.2
Respectful care	5.6	6.0	8.3	8.3	20.0	13.9
Trust to care for child	29.0	55.1	24.1	33.2	47.6	40.7
Effective treatment	11.1	52.2	20.3	28.0	30.2	35.2
Short wait time	4.8	21.9	14.5	17.1	9.3	19.6
Privacy	0.5	1.2	2.4	0.0	0.7	2.6
Family/friends recommend	7.7	19.3	9.7	11.3	14.7	13.8
Religious/community leaders recommend	8.6	0.0	0.0	1.6	0.0	0.0
N	119	157	135	201	132	132

TABLE 8.3.3. REASONS FOR NOT SEEKING CARE FOR PEDIATRIC DIARRHEA

Percentage of last-born children under 2 years with diarrhea in the past two weeks not taken to any source of care by reason for no care-seeking, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Too expensive/could not find money	38.1	25.7	22.3	10.8	36.4	9.3
Facility close/no one there	8.9	1.8	0.0	3.6	3.2	2.7
Distance/no transport	8.2	8.9	1.4	7.0	7.9	1.6
No female provider	0.0	0.0	0.0	0.0	1.7	0.0
Poor quality service	0.0	0.0	2.2	0.9	0.0	0.0
Treatment not effective	5.2	0.0	0.0	3.8	0.0	0.0
Symptoms not severe/cared for at home	8.5	54.7	27.9	31.9	27.7	46.6
Husband opposed	2.3	4.9	3.4	4.7	2.3	10.4
Unable to leave work/home	1.3	20.0	4.2	1.1	13.5	1.8
Up to God	15.4	13.9	37.1	35.9	27.0	35.7
N	34	44	75	70	39	30

Estimates based on low Ns (approx. <30 observations) have large relative standard errors and should be interpreted with caution.

TABLE 8.3.4. FLUIDS OR TREATMENTS GIVEN FOR PEDIATRIC DIARRHEA

Percentage of last-born children under 2 years with diarrhea in the past two weeks who were given treatments or fluids for the illness by type given, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Treatment						
ORS & zinc	16.1	29.8	11.5	21.9	27.1	23.0
ORS	47.7	47.2	26.5	35.4	55.8	42.4
Zinc	29.9	45.0	18.2	34.8	36.8	41.4
Traditional/homemade fluid	25.6	23.1	17.5	20.5	20.6	13.0
Antibiotics	43.9	38.0	27.2	25.8	42.5	37.5
Anti-motilities	6.3	5.3	9.5	2.3	9.5	6.7
OTC-type remedy	4.1	5.6	9.9	4.5	10.2	12.9
Herbal/homemade remedy	13.5	8.3	12.8	16.2	23.3	7.8
How much was child given to drink during diarrhea?						
Nothing to drink	16.6	1.3	2.4	3.1	9.0	6.7
Less to drink	32.0	52.5	53.6	59.1	56.4	59.2
About the same	35.7	33.6	27.6	33.1	21.6	27.2
More to drink	15.4	12.7	16.3	4.3	12.5	6.9
Don't know	0.4	0.0	0.1	0.4	0.5	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
How much was the child given to eat during diarrhea?						
Never gave food/stopped food	NA	6.8	NA	7.1	NA	8.9
Less food	NA	47.9	NA	57.2	NA	59.9
About the same	NA	28.2	NA	34.1	NA	25.5
More to eat	NA	17.1	NA	1.6	NA	5.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	153	201	210	271	171	162

TABLE 8.3.5. REPORTED WAYS TO PREVENT A CHILD FROM GETTING DIARRHEA

Percentage of women aged 15 to 49 years with a child under 2 years reporting ways to prevent pediatric diarrhea, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Ensure child vaccinated	24.4	23.6	20.4	16.6	30.0	17.6
Use toilet/no open waste	19.2	41.4	9.0	5.9	20.1	33.0
Keep house/surroundings clean	43.2	59.8	32.4	29.3	53.5	65.8
Only breastmilk for first 6 months	8.0	9.0	8.2	4.7	19.3	7.6
Safe storage of drinking water	28.3	37.3	13.9	15.2	30.5	24.1
Don't give dirty water	36.7	52.5	32.2	35.5	42.7	42.9
Don't eat bad food	26.1	38.2	33.1	23.6	34.5	38.0
Good nutrition	15.6	24.8	9.3	12.2	15.3	10.8
Handwashing	18.4	29.3	10.1	19.3	22.1	31.2
Proper disposal of infant stool	13.2	30.3	5.5	9.8	11.2	19.9
Don't know	17.3	2.1	21.4	10.6	5.4	3.0
N	892	1,088	1,078	1,045	1,069	1,011

TABLE 8.3.6. TREATMENTS PERCEIVED AS EFFECTIVE AGAINST PEDIATRIC DIARRHEA

Percentage of women aged 15 to 49 years with a child under 2 years reporting effective treatments for pediatric diarrhea, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
ORS	61.3	80.1	44.2	70.2	82.6	75.8
Zinc	38.4	67.9	21.8	41.5	50.3	64.9
Breastmilk	16.5	22.0	6.3	3.0	19.4	12.4
Other fluids	2.2	2.3	1.2	3.1	4.3	0.6
Antibiotics	24.5	31.3	32.6	20.0	31.8	35.8
N	892	1088	1078	1045	1069	1011

TABLE 8.3.7. REPORTED WAYS ORS MAY HELP A CHILD WITH DIARRHEA

Percentage of women aged 15 to 49 years with a child under 2 years reporting ways ORS may help a child with diarrhea, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Never heard of ORS	8.5	7.8	13.9	5.4	4.8	2.1
Replace lost water	59.6	73.8	51.0	63.8	71.6	81.3
Stops diarrhea	40.1	44.0	25.9	28.0	51.0	47.0
Prevents dehydration	24.5	48.2	11.2	11.9	39.3	39.0
Replaces salts & electrolytes	12.7	36.0	8.1	4.1	26.8	21.8
Restores energy	29.1	32.2	19.2	21.3	40.7	39.6
N	892	1088	1078	1045	1069	1011

TABLE 8.3.8. REPORTED WAYS ZINC MAY HELP A CHILD WITH DIARRHEA

Percentage of women aged 15 to 49 years with a child under 2 years reporting ways zinc may help a child with diarrhea, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Never heard of zinc	25.8	10.5	34.3	19.5	21.1	14.6
Makes less severe	32.8	46.2	19.4	29.0	36.6	48.7
Shorter duration	30.5	50.5	21.0	29.9	46.8	58.0
Prevents dehydration	16.3	35.9	10.5	8.3	31.7	33.5
Less likely to recur	4.4	30.7	4.4	0.6	16.0	4.3
Restores energy	19.4	37.9	13.0	12.7	26.3	29.3
N	892	1088	1078	1045	1069	1011

TABLE 8.3.9. 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, by baseline and endline rounds

	KEBBI		ZAMFARA		UNADJUSTED DID	ADJUSTED DID
	BASELINE	ENDLINE	BASELINE	ENDLINE		
	%	%	%	%	PP	PP
Belief/attitude						
It is common for children in this community to get diarrhea	70.7	71.9	67.8	66.2	1.7	2.2
Diarrhea can lead to dehydration and even death	85.0	97.1	93.6	89.5	14.7**	15.3**
I know how to prepare ORS	55.0	62.2	81.0	81.4	6.9	9.4
Self-efficacy						
Likelihood to continue breastfeeding during next diarrhea	89.2	97.7	97.3	97.3	8.4*	8.3*
Likelihood to give child ORS for next diarrhea episode	89.3	93.0	93.1	95.5	1.3	2.1
Likelihood to give child zinc for next diarrhea episode	82.5	88.3	88.6	93.2	-7.1	-7.0
N	892	1,088	1,069	1,011		

*** p<.001, **p<.01, * p<.05

TABLE 8.3.10. 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, by baseline and endline rounds

	SOKOTO		ZAMFARA		UNADJUSTED DID	ADJUSTED DID
	BASELINE	ENDLINE	BASELINE	ENDLINE		
	%	%	%	%	PP	PP
Belief/attitude						
It is common for children in this community to get diarrhea	76.6	78.3	67.8	67.5	2.0	1.6
Diarrhea can lead to dehydration and even death	87.6	92.5	87.6	92.5	7.3	8.4
I know how to prepare ORS	54.9	71.2	81.0	81.4	16.0	17.8*
Self-efficacy						
Likelihood to continue breastfeeding during next diarrhea	89.2	94.8	97.3	97.3	5.6	6.0
Likelihood to give child ORS for next diarrhea episode	74.0	88.7	93.1	95.5	12.3	13.5*
Likelihood to give child zinc for next diarrhea episode	59.3	82.1	79.9	93.1	9.4	10.6
N	1078	1,045	1,069	1,011		

*** p<.001, **p<.01, * p<.05

8.4 Child health ideations

Key findings

Perceptions about the quality of available health services were generally favorable. Female respondents reported having confidence in health providers for sick children (Tables 8.4.1, 8.4.2). Agreement with the belief that "a healthcare provider is always the best person to talk to when a child is sick" was high and increased to nearly all women in all three states, from 89% to 97% in Kebbi, from 83% to 93% in Sokoto, and from 92% to 98% in Zamfara. Confidence in the availability of treatments at health facilities was not as high but appears to be improving everywhere. Agreement with the statement that "facilities in my community often have treatment needed for a sick child" increased 66% to 74% in Kebbi and from 65% to 82% in Sokoto, but still remained lower than in Zamfara (74% at baseline and 89% at endline).

Women's decisions about care-seeking for child illnesses are heavily influenced by the people in their lives, most notably their spouses. Husbands grew in importance as influencers in all three states, from 80% to 94% in Kebbi, from 84% to 88% in Sokoto, and from 81% to 90% in Zamfara (Table 8.4.3). The importance of mothers and mothers-in-law increased in Kebbi but fell in the other two states.

Importantly, the percentage of women, most of whom were already confident in their capacity to influence their partners about care seeking for a sick child, increased in all three states, from 88% to 95% in Kebbi, from 87% to 91% in Sokoto, and from 95% to 97% in Zamfara (Tables 8.4.1, 8.4.2).

TABLE 8.4.1. PERCEPTIONS OF HEALTH SERVICES QUALITY AND SELF-EFFICACY IN CONVINCING PARTNER TO SEEK CARE 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, and confidence to convince partner to seek care for a sick child, by baseline and endline rounds

	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Perceptions						
Health provider is always the best person to talk to when a child is sick	88.6	96.5	91.8	97.7	2.1	3.4
Facilities in my community often have treatment needed for a sick child	65.8	73.5	74.3	89.4	-7.3	-2.1
Self-efficacy						
Confident to convince partner to seek care for sick child	85.6	94.6	91.7	96.8	4.0	4.2
N	892	1,083	1,069	986		

*** p<.001, **p<.01, * p<.05

TABLE 8.4.2. PERCEPTIONS OF HEALTH SERVICES QUALITY AND SELF-EFFICACY IN CONVINCING PARTNER TO SEEK CARE 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, and confidence to convince partner to seek care for a sick child, by baseline and endline rounds

PERCEPTIONS	SOKOTO		ZAMFARA		UNADJUSTED DID	ADJUSTED DID
	BASELINE	ENDLINE	BASELINE	ENDLINE		
	%	%	%	%	PP	PP
Health provider is always the best person to talk to when a child is sick	82.7	93.0	91.8	97.7	4.5	5.7
Facilities in my community often have treatment needed for a sick child	64.5	81.6	74.3	89.4	2.1	4.8
Self-efficacy						
Confident to convince partner to seek care for sick child	84.8	84.8	91.7	96.8	-5.0	-3.9
N	1,078	1,045	1,069	986		

*** p<.001, **p<.01, * p<.05

TABLE 8.4.3. CARE-SEEKING INFLUENCERS 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, who else influences a woman's decision or seek care for a sick child, and confidence to convince partner to seek care for a sick child, by baseline and endline rounds

CARE-SEEKING INFLUENCERS	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Husband	80.0	94.2	83.6	88.3	81.3	90.2
Mother-in-law	11.9	20.6	17.2	9.2	7.3	5.1
Mother	10.4	17.5	6.4	4.0	7.5	3.4
Other own family	0.4	0.1	0.6	0.1	0.3	0.0
Other partner family	0.1	0.0	0.7	0.1	1.0	0.3
Friends	0.8	2.6	1.7	0.8	4.2	1.2
Health provider	2.1	0.4	3.0	0.2	4.5	2.5
Religious/community leader	0.2	0.0	0.1	0.5	0.4	0.2
N	892	1,083	1,078	1,045	1,069	986

Chapter 9. Gender

Key findings

Household decision-making: Across all three states, there was a pattern of increasing influence of husbands on household decision-making, with consequent declines in joint decision-making. For example, the percentage of husbands who make decisions about major household purchases, already the majority of husbands at baseline, increased in all three states, from 69% to 80% in Kebbi, from 77% to 86% in Sokoto, and from 51% to 68% in Zamfara. On the positive side, women in all three states reported increased sole control over spending of their own money, which increased from 41% to 69% in Kebbi, from 57% to 67% in Sokoto, and from 56% to 60% in Zamfara (Table 9.1.1).

Gender roles: From women's perspective, gender role perceptions remained largely unchanged over the course of the study period (Tables 9.1.2, 9.1.3). At endline, nearly all respondents—95% in Kebbi, 92% in Sokoto, and 92% in Zamfara - agreed that it is a woman's job to mainly take care of the home and cook for her family. This percentage was slightly higher at endline relative to baseline. There were small increases in all three states in the attitude that it is important for couples to discuss child health and make decisions together, from 95% to 97% in Kebbi, from 91% to 93% in Sokoto, and from 94% to 97% in Zamfara. Somewhat in contrast to the increasing dominance of husbands in decision-making noted above, most women—87% in Kebbi, 78% in Sokoto, and 93% in Zamfara - believe that a wife should play a role in household decision-making, even though few seem to, at least for the household decisions considered here. There were slight decreases in all three states in agreement with the statement that a good marriage is more important for girl than an education, from 79% to 72% in Kebbi, from 86% to 78% in Sokoto, and from 75% to 64% in Zamfara.

9.1. Gender roles

TABLE 9.1.1. 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, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Who usually decides how your money will be used?						
Respondent	41.0	69.0	56.8	66.6	55.5	59.8
Spouse	29.8	21.4	23.9	27.7	28.2	26.3
Both	23.5	9.6	14.6	4.7	15.2	13.5
Other	0.7	0.0	0.2	0.0	0.4	0.0
Don't know	5.0	0.0	4.6	1.0	0.7	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Who usually decides how your husband's money will be used?						
Respondent	4.1	1.0	2.6	2.5	17.9	2.2
Spouse	63.6	81.4	78.1	89.6	50.6	76.0
Both	26.6	17.0	18.6	7.5	29.4	21.6
Other	0.8	0.1	0.4	0.0	0.7	0.1
Don't know	4.9	0.5	0.3	0.4	1.3	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Who usually decides about major household purchases?						
Respondent	4.0	0.8	1.9	3.3	11.3	5.6
Spouse	68.8	79.7	76.9	85.5	51.0	68.4
Both	20.2	19.0	19.8	10.8	32.3	25.9
Other	1.1	0.1	0.9	0.1	0.9	0.1
Don't know	5.9	0.4	0.5	0.4	4.4	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Who usually decides about schooling?						
Respondent	3.5	0.2	1.2	1.3	7.9	1.3
Spouse	55.1	74.1	52.3	86.0	43.0	69.7
Both	13.7	11.3	8.4	7.2	27.9	25.8
Other	1.1	0.1	0.5	0.3	1.1	0.2
Don't know	26.6	14.3	37.6	5.2	20.1	3.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Who usually decides about work outside the home?						
Respondent	4.2	0.9	1.3	1.4	19.8	4.6
Spouse	64.2	90.0	72.0	91.5	48.8	76.6
Both	13.8	8.7	8.9	5.5	16.5	18.6
Other	1.2	0.1	0.9	0.0	3.3	0.1
Don't know	16.7	0.4	16.9	1.6	11.6	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	892	1,083	1,078	1,045	1,069	986

TABLE 9.1.2. 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, by baseline and endline rounds

	KEBBI		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Important for couples to discuss child health and make decisions together	96.3	97.9	96.7	98.7	-0.4	-0.4
A woman should play a role in household decision-making	85.9	87.7	87.4	94.6	-5.4	-3.8
It's more important for boys to get an education than girls	74.3	69.8	71.1	61.4	5.2	2.1
A good marriage is more important for a girl than a good education	80.0	72.4	77.5	65.0	4.9	3.8
It's a woman's job to care for the family and the home	93.9	95.7	87.2	93.6	-4.6	-6.1
N	892	1,088	1,069	1,011		

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

*** p<.001, **p<.01, * p<.05

TABLE 9.1.3. 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, by baseline and endline rounds

	SOKOTO		ZAMFARA		UNADJUSTED	ADJUSTED
	BASELINE	ENDLINE	BASELINE	ENDLINE	DID	DID
	%	%	%	%	PP	PP
Important for couples to discuss child health and make decisions together	91.5	95.1	96.7	98.7	1.5	1.9
A woman should play a role in household decision-making	83.8	78.7	87.4	94.6	-12.3	-11.8
It's more important for boys to get an education than girls	74.6	79.8	71.1	61.4	14.9	10.8
A good marriage is more important for a girl than a good education	86.2	78.8	77.5	65.0	5.1	2.3
It's a woman's job to care for the family and the home	91.8	92.3	87.2	93.6	-5.9	-7.0
N	1,078	1,045	1,069	1,011		

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

*** p<.001, **p<.01, * p<.05

Chapter 10. Breakthrough ACTION/ Nigeria program exposure

Key findings

In the integrated states of Kebbi and Sokoto, Breakthrough ACTION/Nigeria conducts multilayered SBC programming across health areas through multiple channels, including radio, community events, household visits, opinion leader influencers, Airtel and mobile applications, predominantly through the umbrella of ***Albishirin Ku!*** branding. In Zamfara, Breakthrough ACTION/Nigeria conducts malaria community activities, absent the ***Albishirin Ku!*** branding, as well as malaria-specific radio spots that are run in all three states. While not focused on populations in Zamfara, ***Albishirin Ku!*** radio programming from Sokoto evidently spills over into the state.

Exposure to Breakthrough ACTION/Nigeria interventions, both branded and unbranded, increased from baseline to endline across all three states and for nearly all interventions. By the endline survey wave, self-reported exposure to any Breakthrough ACTION/Nigeria or ***Albishirin Ku!*** intervention had reached half of women in Kebbi, approximately six in ten women in Sokoto, and nearly three-quarters of women in Zamfara (Table 10.1.1). Exposure to any ***Albishirin Ku!*** radio component, as defined by Breakthrough ACTION/Nigeria, increased in all three states, with the largest increase being observed in Zamfara (35.5% at baseline, 57.4% at endline), followed by Sokoto (40.3% at baseline, 54.1% at endline) and Kebbi (25.3% at baseline, 32.1% at endline). At endline, exposure to ***Albishirin Ku!*** radio programming was highest in Zamfara, nearly twice the exposure level in the integrated state of Kebbi. The increases in exposure to ***Albishirin Ku!*** radio content increased across components. For example, exposure to the ***Albishirin Ku!*** radio program increased from 19% to 24% in Kebbi, from 28% to 38% in Sokoto, and from 12% to 23% in Zamfara. At endline, exposure to any malaria radio jingle was highest in Zamfara (70%), followed by Sokoto (44%) and Kebbi (28%). Each of these represented an increase from the baseline.

In Kebbi, one in ten women rat endline reported participating in a Breakthrough ACTION/Nigeria community event/dialogue, while one in five reported a home visit by a Breakthrough ACTION/Nigeria CV. Reporting of exposure to Breakthrough ACTION/Nigeria community events was lower in Sokoto. While 12% of women reported participating in a community dialogue, only 3% of women reported that it had Breakthrough ACTION/Nigeria branding. Similarly, while 10% of women reported a home visit by a CV, only 3% reported that it involved Breakthrough ACTION/Nigeria branding. As recall of specific logos may have been difficult for respondents, the true levels of exposure are likely to be bounded by the estimates of unbranded and branded exposure. As designed, almost no women in Zamfara reported exposure to Breakthrough ACTION/Nigeria branded community dialogues nor to household visits (Table 10.1.1).

The increases in exposure to ***Albishirin Ku!*** were reflected across all wealth quintiles in all the three states, and particularly among the poorest (Table 10.2.1). In both waves, women in the wealthiest quintile, as expected, were the most likely to report exposure to radio programming in Kebbi (44% at baseline, 48% at endline) and Sokoto (63% at baseline, 88% at endline), although even women in the lowest wealth quintile reported substantial improvements in exposure, from 14% to 27% in Kebbi and from 22% to 38% in Sokoto. In Zamfara, exposure to ***Albishirin Ku!*** radio programming increased by 33 pp for women in the lowest quintile as compared with 22 pp on average across all women in Zamfara. These patterns were also evident in exposure to any Breakthrough ACTION/Nigeria intervention.

TABLE 10.1.1. *ALBISHIRIN KU!* AND BREAKTHROUGH ACTION/NIGERIA EXPOSURE

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who reported exposure to specific *Albishirin Ku!* programming, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA	
	BASELINE (%)	ENDLINE (%)	BASELINE (%)	ENDLINE (%)	BASELINE (%)	ENDLINE (%)
Exposure to any *Albishirin Ku!* radio component (Yes to any q1207a q1207b q1207c q1208d)	25.3	32.0	40.3	54.3	35.5	57.5
Self-reported exposure to any Breakthrough ACTION or AK intervention	29.8	49.8	47.3	57.5	48.9	73.5
Listened to *Albishirin Ku!* program on the radio (q1207a)	19.4	24.4	27.6	37.6	12.4	22.8
Heard radio program with couple Faruk and Jamila (q1207b)	9.0	20.7	18.3	26.3	8.2	14.4
Heard Wannan Sakone Daga Ma'aikatar Lafiya Kasa, Da Ta Jiha, Da Kuma (q1207c)	20.0	25.1	32.0	28.7	31.9	45.7
Heard *Albishirin Ku!* song on the radio (q1208d)	17.0	26.9	26.4	50.8	18.9	36.6
Any malaria radio jingle	14.7	28.2	31.9	43.8	39.9	70.1
Attended a community event/dialogue in the past 12 months (q1111)	0.8	13.3	1.4	12.0	0.7	1.2
Attended CV community events with Breakthrough ACTION branding in past 12 months	0.1	10.3	0.2	3.2	0.0	0.1
Received a household visit with a CV in the past 12 months (q1116)	10.8	28.4	10.4	10.0	8.1	6.4
Received a household visit with a CV with Breakthrough ACTION branding in the past 12 months	1.6	19.6	0.8	3.3	0.5	0.2
Heard slogan *Albishirin Ku!* with Airtel 3-2-1 on a mobile phone in the past 12 months?	0.0	1.0	0.0	1.0	0.0	0.6
N	892	1,088	1,078	1,045	1,069	1,011

Data are from BSS_Media-wave_state_end.xlsx

TABLE 10.2.1 EXPOSURE TO ANY *ALBISHIRIN KU!* RADIO PROGRAM, BY WEALTH QUINTILE

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who reported exposure to any *Albishirin Ku!* radio programming for each wealth quintile, by baseline and endline rounds

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE %	ENDLINE %	CHANGE PP	BASELINE %	ENDLINE %	CHANGE PP	BASELINE %	ENDLINE %	CHANGE PP
Lowest	13.8	26.7	12.9	22.0	38.2	16.2	9.8	43.2	33.4
2nd lowest	25.7	15.4	-10.3	42.6	46.4	3.8	18.9	40.3	21.4
Middle	31.4	30.2	-1.2	51.1	56.6	5.5	22.6	51.5	28.9
2nd highest	21.6	46.7	25.1	53.1	71.1	18.0	52.2	66.3	14.1
Highest	44.1	48.1	4.0	63.3	87.6	24.3	55.1	63.1	8.0
Total	25.3	32.1	6.8	40.3	54.1	13.8	35.5	57.4	21.9
N	892	1,088		1,078	1,045		1,069	1,011	

TABLE 10.2.2 EXPOSURE TO ANY BREAKTHROUGH ACTION/NIGERIA ACTIVITIES, BY WEALTH QUINTILE

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who reported exposure to any *Albishirin Ku!* Programming for each wealth quintile, by baseline and endline rounds

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE
	%	%	PP	%	%	PP	%	%	PP
Lowest	17.6	42.3	24.7	28.5	41.2	12.7	18.7	59.1	40.4
2nd lowest	30.5	37.7	7.2	49.0	50.0	1.0	26.7	53.8	27.1
Middle	34.4	47.7	13.3	57.9	59.8	1.9	38.7	71.5	32.8
2nd highest	27.9	59.2	31.3	62.6	77.1	14.5	64.9	80.9	16.0
Highest	49.7	72.0	22.3	70.7	87.6	16.9	73.4	79.5	6.1
Total	29.8	49.8	22.0	47.3	57.4	10.1	48.9	73.4	24.5
N	892	1,088		1,078	1,045		1,069	1,011	

TABLE 10.2.3 EXPOSURE TO ANY COMMUNITY DIALOGUE/EVENT, BY WEALTH QUINTILE

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who reported exposure to any *Albishirin Ku!* Programming for each wealth quintile, by baseline and endline rounds

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE
	%	%	PP	%	%	PP	%	%	PP
Lowest	0.8	12.8	12.0	0.8	9.2	8.4	0.0	1.5	1.5
2nd lowest	0.7	16.5	15.8	1.7	11.3	9.6	0.0	1.7	1.7
Middle	0.8	9.9	9.1	1.6	16.3	14.7	0.0	0.5	0.5
2nd highest	0.9	10.2	9.3	3.5	15.4	11.9	2.1	0.2	-1.9
Highest	0.8	21.1	20.3	0.0	9.5	9.5	0.7	2.2	1.5
Total	0.8	13.3	12.5	1.4	12.0	10.6	0.7	1.2	0.5
N	892	1,088		1,078	1,045		1,069	1,011	

TABLE 10.2.4 EXPOSURE TO ANY CV HOUSEHOLD VISIT, BY WEALTH QUINTILE

Percentage of women aged 15 to 49 years currently pregnant or with a child under 2 years who reported exposure to any *Albishirin Ku!* Programming for each wealth quintile, by baseline and endline rounds

	KEBBI			SOKOTO			ZAMFARA		
QUINTILE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE	BASELINE	ENDLINE	CHANGE
	%	%	PP	%	%	PP	%	%	PP
Lowest	9.2	20.1	10.9	7.2	11.2	4.0	0.0	1.5	1.5
2nd lowest	6.3	24.6	18.3	12.3	6.1	-6.2	3.7	1.7	-2.0
Middle	8.6	27.9	19.3	14.1	10.1	-4.0	9.1	4.1	-5.0
2nd highest	18.5	29.7	11.2	9.4	18.0	8.6	17.1	5.2	-11.9
Highest	16.1	48.9	32.8	11.7	5.5	-6.2	5.5	11.3	5.8
Total	10.8	28.4	17.6	10.4	10.0	-0.4	8.1	6.4	-1.7
N	892	1,088		1,078	1,045		1,069	1,011	

10.3 *Albishirin Ku!*

TABLE 10.3.1. *ALBISHIRIN KU!* RADIO PROGRAMMING PERCEPTIONS

Perceptions of *Albishirin Ku!* Programming among women with a child under 2 years, endline round

	KEBBI	SOKOTO	ZAMFARA
	%	%	%
Frequency of hearing *Albishirin Ku!* radio program			
Never	0.4	0.7	0.0
Every day	9.9	4.2	5.7
A few times a week	48.4	34.4	47.1
Once a week	24.7	19.5	37.8
Less than once a week	14.4	37.6	8.7
Don't know	2.2	3.5	0.7
Messages from radio program			
Family planning for spacing births	62.5	37.7	27.8
Family planning for limiting births	47.3	17.3	19.5
Facility birth	38.7	16	14.7
Birth plans	56.0	17.6	24.1
Antenatal care	71.2	70.8	64.4
Diarrhea	30.5	13.8	24.6
Malaria	51.2	58.1	77.1
Cough with rapid breaths	36.8	9.4	4.2
Child nutrition	43.1	15.6	9.6
Immunizations	63.7	47.4	35.4
Breastfeeding	36.6	12.6	21.2
Maternal nutrition	37.8	9.5	9.9
Newborn care	31.3	10.3	5.7
Postpartum care	34.6	10.0	5.3
Water, sanitation and hygiene	31.6	16.8	25.5
Perceptions			
I enjoyed listening to this program	99.8	95.6	99.7
I learned something new from this program	95.6	84.6	99.9
I discussed this program with family and friends	85.9	64.6	89.3
Total	214	263	361

TABLE 10.3.2. *ALBISHIRIN KU!* RADIO EXPOSURE AND HEALTH MESSAGES HEARD ON THE RADIO

Percentage of women 15 to 49 years currently pregnant or with a child under 2 years who had heard specific ***Albishirin Ku!*** radio content and messages on the radio by type, by baseline and endline rounds

	KEBBI		SOKOTO		ZAMFARA		BREAKTHROUGH ACTION/NIGERIA NOTES
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE	
	%	%	%	%	%	%	
Listened to *Albishirin Ku!* program on the radio	19.4	24.4	27.6	37.6	12.4	22.8	Q1207a
Heard radio program with couple Faruk and Jamila	9.0	20.7	18.3	26.3	8.2	14.4	Q1207b
Heard Wannan Sakone Daga Ma'aikatar Lafiya Kasa, Da Ta Jiha, Da Kuma	20.0	25.1	32.0	28.7	31.9	45.7	Q1207c
Heard *Albishirin Ku!* Song on the radio	17.0	26.9	26.4	50.8	18.9	36.6	Q1208d
N	892	1,088	1,078	1,045	1,069	1,011	
Key messages of *Albishirin Ku!* song:							
Health	58.8	69.9	22.1	21.3	18.0	48.2	
Albishirin Ku!	41.2	30.7	42.9	43.5	55.0	34.5	
Pregnant women going to ANC	46.5	51.0	25.4	30.5	27.9	13.4	
Childbirth spacing/family planning	32.2	53.7	18.1	35.8	21.8	8.0	
Nutrition for children	26.7	42.4	5.8	13.2	13.2	15.7	
Prompt care for malaria	23.8	28.6	2.2	7.3	12.3	18.0	
Maternal nutrition during pregnancy	18.9	42.3	8.3	12.1	11.8	9.1	
N	156	303	316	534	210	383	

TABLE 10.3.3. MALARIA JINGLES OR SHOWS HEARD ON THE RADIO

Percentage of women 15 to 49 years currently pregnant or with a child under 2 years who had heard ***Albishirin Ku!*** radio jingles, by baseline and endline rounds

RADIO JINGLE	KEBBI		SOKOTO		ZAMFARA		BREAKTHROUGH ACTION/NIGERIA NOTES
	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %	BASELINE %	ENDLINE %	
Original malaria spots-check broadcast schedules by state for timelines							
Auto mechanic and driver discussing malaria (q1210a)	8.9	18.9	17.8	22.9	26.5	49.2	Malaria PSA
"My Car"	10.1	18.0	24.9	30.3	29.0	57.0	Malaria PSA
Football coach and captain talking about malaria	8.4	15.9	17.8	19.8	26.1	50.1	Malaria PSA
"The Champion"	10.1	16.0	24.5	28.0	34.3	60.7	Malaria PSA
"Mama Put" Fever Case Management Campaign: Started broadcasting November 2021 in all 3 states							
Food seller discussing with customer who was sick but is now well	NA	17.2	NA	21.0	NA	48.3	Mama Put (Malaria)
"Adherence to Drugs"	NA	19.5	NA	30.5	NA	59.0	Mama Put (Malaria)
Food seller discussing with customer who was complaining of a fever	NA	17.6	NA	20.3	NA	49.0	Mama Put (Malaria)
"Test before treatment"	NA	19.4	NA	27.7	NA	59.2	Mama Put (Malaria)
Food seller discussing with husband about child with fever not taken for care	NA	17.8	NA	19.9	NA	45.4	Mama Put (Malaria)
"Prompt care-seeking"	NA	19.2	NA	28.0	NA	56.0	Mama Put (Malaria)
Any malaria radio jingle	14.7	28.2	31.9	43.8	39.9	70.1	
N	892	1,088	1,078	1,045	1,069	1,011	

TABLE 10.3.3. MEDIA PARTNERSHIP PROGRAMMING SHOWS HEARD ON THE RADIO

Percentage of women 15 to 49 years currently pregnant or with a child under 2 years who had heard Media Partnership Programming, by baseline and endline rounds

RADIO SHOW	KEBBI		SOKOTO		ZAMFARA		BREAKTHROUGH ACTION/ NIGERIA NOTES
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE	
	%	%	%	%	%	%	
Any media partnership programming	20.8	25.0	31.6	30.4	34.5	44.0	
Taka Naka Rawan	7.9	14.6	12.6	13.7	9.5	16.7	Malaria radio program ("Play your part")
Don Tuwon Gobe	9.0	16.0	13.1	15.2	11.5	17.5	Integrated ("Preparing for tomorrow")
Kai da Lafiya	13.5	18.3	16.6	20.3	14.6	26.0	Integrated ("You and Your Health")
Lafiyar mata da kananan yara	16.6	22.3	23.8	25.3	29.6	39.8	Integrated ("Women and children health")
Lafiyar Uwar Komai	17.1	21.7	22.4	23.4	19.8	31.6	Integrated "Health of the Mother"
N	892	1,088	1,078	1,045	1,069	1,011	

Chapter 11. Examining the interplay of norms, attitudes, beliefs with priority behaviors

To bring together all of the data presented in this report on the changes in ideational factors and priority behaviors targeted by Breakthrough ACTION/Nigeria, we utilized multivariate regression analysis to examine the associations between ideational factors and those priority behaviors.

11.1 Modern contraceptive use

Empirical research across many years and many countries has helped to shed light on the importance of different factors in influencing modern contraceptive use. In this context, several general conclusions emerged about the factors associated with the use of modern contraception.

1. Education matters: The level of education of both the woman and, to some extent, her husband (especially Islamic education) significantly impacts the likelihood of using modern contraception. Higher education levels are associated with higher probabilities of using modern contraception. The adjusted probability of a woman using modern contraception increases with her level of education. For women with no education, the probability is 15.9%. This increases to 20.6% for those with primary education and further to 25.7% for women with secondary or higher education. The p-value for both primary education and secondary or higher education is statistically significant.
2. An interesting finding here is that if the husband's education is Islamic, the adjusted probability of using modern contraception is 24.7%, the p-value is close to significance at 0.053. The education level otherwise does not appear to significantly impact the probability of using modern contraception.
3. Attitudes toward contraception matter: Attitudes toward family planning and contraception significantly influence the probability of using modern contraception. These attitudes include approval of contraception for spacing births, belief that couples using family planning have a better quality of life, and the belief that side effects are normal and usually go away. Approval of contraception for spacing births is strongly associated with using modern contraception. The probability of using modern contraception increases from 5.0% when the woman does not approve of contraception for spacing births to 20.2% when she does, a statistically significant difference. Couples using family planning have a better quality of life: Agreement with this statement is associated with a higher probability of using modern contraception (16.6% compared to 6.4% for those who disagree or don't know), a difference that is statistically significant. Side effects are normal and usually go away: Agreement with this statement increases the probability of using modern contraception to 17.1% from 10.7%, a significant difference. Contraceptives can cause cancer: Disagreement with this statement (or lack of knowledge) results in a higher probability of using modern contraception (16.4%). Those who agree have a significantly lower probability of 11.4%.
4. Perceived norms matter: The perceived norms within a woman's community can significantly influence her likelihood of using modern contraception. For instance, the belief that most couples in her community use family planning significantly increases the likelihood of her using modern contraception. Agreement with this statement significantly increases the probability of using modern contraception to 17.3% from 10.1%.
5. Collaborative decision-making: The decision-making dynamic within a relationship has a significant effect. When both partners decide together about using a contraceptive method, the probability of using modern contraception is highest. When the decision is primarily made by the woman herself, the adjusted probability of using modern contraception is 11.2%. When the decision is mainly the partner's, the probability decreases slightly to 9.2%. However,

when both partners decide together, the probability of using modern contraception significantly increases to 19.0%. This decision-making dynamic (both deciding together) is statistically significant, highlighting the influence of collaborative decision-making on contraceptive use.

TABLE 11.1. LOGISTIC REGRESSION: CURRENT USE OF MODERN CONTRACEPTION

	ODDS RATIO	[95% CONF.	INTERVAL]	P>T	PR (Y=1)
Mother's age					
15–24 years	1.000				15.5%
25–34 years	1.064	0.825	1.372	0.632	16.1%
35–49 years	1.046	0.755	1.447	0.787	16.0%
Woman's education					
None	1.000				15.9%
Primary	1.550	1.007	2.385	0.046	20.6%
Secondary or higher	2.385	1.517	3.749	0.000	25.7%
Islamic	0.359	0.119	1.083	0.069	7.7%
Husband's education					
None	1.000				13.9%
Primary	0.965	0.523	1.782	0.909	13.6%
Secondary	1.289	0.841	1.975	0.243	16.0%
Tertiary	0.971	0.650	1.452	0.887	13.6%
Islamic	3.065	0.986	9.527	0.053	24.7%
Wealth quintile					
Lowest	1.000				15.8%
Second	0.919	0.531	1.592	0.763	15.0%
Middle	0.650	0.365	1.158	0.143	11.9%
Fourth	1.005	0.575	1.758	0.986	15.9%
Highest	1.234	0.676	2.253	0.492	17.9%
Kebbi					
No	1.000				15.8%
Yes	1.037	0.664	1.621	0.872	16.2%
Sokoto					
No	1.000				15.6%
Yes	1.200	0.778	1.851	0.408	17.4%
Wave					
Baseline	1.000				16.4%
Endline	0.906	0.626	1.310	0.598	15.4%
Exposed to any Breakthrough ACTION/Nigeria activities					
No					14.4%
Yes	1.259	0.891	1.778	0.190	16.6%
Equality index					
0	1.000				22.9%
1	0.625	0.207	1.886	0.402	17.9%
2	0.497	0.164	1.506	0.215	15.7%
3	0.403	0.132	1.231	0.110	13.8%
4	0.587	0.191	1.810	0.352	17.3%

	ODDS RATIO	[95% CONF.	INTERVAL]	P>T	PR (Y=1)
Who decides about using a contraceptive method?					
Mainly myself	1.000				11.2%
Mainly my partner's decision	0.765	0.425	1.377	0.369	9.2%
Both decide together	2.250	1.587	3.188	0.000	19.0%
Approve of contraception for spacing births					
No	1.000				5.0%
Yes	6.337	3.710	10.823	0.000	20.2%
People in community would call you bad names if they knew you were using contraception					
Disagree/DK	1.000				15.6%
Agree	1.165	0.823	1.648	0.387	17.1%
Couples using family planning have a better quality of life					
Disagree/DK	1.000				6.4%
Agree	3.788	1.716	8.363	0.001	16.6%
Side effects are normal & usually go away					
Disagree/DK	1.000				10.7%
Agree	2.041	1.387	3.003	0.000	17.1%
Religious leaders should speak about family planning					
Disagree/DK	1.000				16.1%
Agree	0.970	0.669	1.404	0.869	15.8%
Most couples in my community use family planning					
Disagree/DK	1.000				10.1%
Agree	2.268	1.527	3.370	0.000	17.3%
Contraceptives can cause cancer					
Disagree/DK	1.000				16.4%
Agree	0.568	0.383	0.843	0.005	11.4%
It is important for couples to discuss contraception					
Disagree/DK	1.000				14.1%
Agree	1.232	0.754	2.012	0.404	16.0%
Intercept	0.003	0.001	0.012	0.000	
Obs	5084				
Design df	186				
F(29,158)	13.52				
Prob>F	0.000				

11.2 Intermittent preventive treatment of malaria during pregnancy

In these regression models, we examined factors associated with the likelihood that a pregnant women received IPTp involving a preventive regimen of three or more doses of the antimalarial drug SP. Many of the patterns observed for contraceptive use were also apparent for this outcome.

1. Education again matters: Women with a secondary or higher level of education are significantly more likely (28.8%) to receive IPTp3 compared to those with primary education or no education. The effects for Islamic education for the woman are not statistically different than for no formal education.
2. Higher levels of education for husbands also seem to increase the likelihood that a woman received IPTp3. If the husband has a primary or tertiary level of education, the woman's probability of receiving IPTp3 increases to 26.5% and 24.8%, respectively, relative to only 17.3% if the husband has no formal education. The effects of secondary education are also positive—increasing the likelihood to 23.1% - but this was statistically significant at only the .071 level. As for women, the effects of Islamic education are not statistically different than for no formal education
3. Location (Kebbi): In spite of considerable efforts to encourage uptake of IPTp3 in the malaria-only state of Zamfara, women living in Kebbi have a much higher probability of receiving IPTp3 (32.2%) compared to those in Zamfara (18.8%). Women in Sokoto had a slightly greater likelihood (22.9%) but this result was not statistically significant.
4. Mother's age: Women aged between 35-49 years have a higher likelihood (24.6%) of receiving IPTp3 compared to younger women—21.2% for women 25-34 years and 19.1% for women 15-24 years.
5. Attitudes and beliefs: A few particular beliefs were associated with a significant increase in the likelihood of IPTp3. The belief that medicines given to pregnant women works well to prevent malaria was associated with a likelihood of 21.7%, relative to a likelihood of only 3.2% if a woman did not hold a belief in the efficacy of antimalarials during pregnancy. Two other attitudes were also positively associated with greater likelihood of IPTp3 uptake. Women who believe that a pregnant woman should sleep under a net every night were 4.1 pp more likely to have received IPTp3 (21.2% versus 17.1%), while women who believe that health facilities usually have necessary treatments were 3.7 pp more likely (21.7% versus 18.0%).
6. Women's empowerment and self-efficacy: The results for measures of women's empowerment and self-efficacy appear mixed. The Equality Index in the regression model is intended to measure women's empowerment, with higher numbers indicating greater acceptance of attitudes supporting more equal roles between husbands and wives in a household. However, the results suggest no significant association between the level of women's empowerment (as measured by the Equality Index) and the likelihood of receiving IPTp3.
7. In contrast, measures of a woman's self-efficacy, as measured by her confidence in starting a conversation with her husband about ANC and in her ability to get to a health facility for ANC—appear to show positive associations with IPTp3 uptake, albeit the former not statistically significant. Specifically, women who reported feeling confident in getting to a facility for ANC were significantly more likely to complete IPTp3 (Confident: 23.2%, Not Confident: 10.5%, p=0.001). This suggests that women who feel confident in their ability to access health care services may be more likely to complete the recommended treatment regimen. Women who reported confidence in starting a conversation with their husband about ANC were also more likely to complete IPTp3 (Confident: 21.8%, not confident: 14.5%), although the association was not statistically significant (p=0.090).
8. While these associations between self-efficacy and IPTp3 uptake are indeed noteworthy, we should exercise caution when interpreting these results. The measures of a woman's confidence and the uptake of IPTp3 are not contemporaneous; confidence is assessed at the time of the interview, while IPTp3 uptake refers to a past event. This temporal discrepancy introduces the possibility that having completed IPTp3 could influence a woman's sense of self-efficacy, as recorded during the interview, rather than the reverse—that more confident women are more likely to undertake IPTp3. Both scenarios are plausible and likely co-occur. However, discerning the exact relationship between these two factors using retrospective data is not feasible, hence we

should refrain from overemphasizing the measured associations.

9. Exposure to Breakthrough ACTION/Nigeria interventions: There was no evidence to support an effect of Breakthrough ACTION/Nigeria SBC on uptake of IPTp3 in this sample, although with observational data such as these causal inferences are not permitted regardless. Controlling for all other factors in the model, women who self-report exposure to any malaria jingle on the radio are no more likely to receive three or more doses of SP/F than women who do not (exposed: 21.7%, unexposed: 20.5%, p=.64). Women who reported participating in any community event with a CV were actually predicted to be less likely to complete IPTp3 (participated: 18.4%, did not participate: 21.2%, p=.443). Only for household visits by a CHW was there evidence to suggest an effect (visited: 24.7%, not visited: 20.6%), but this association did not reach conventional levels of statistical significance (p=0.150).

10. Trend: Controlling for the factors in this model, there was no evidence of a secular improvement in IPTp3 uptake.

TABLE 11.2. LOGISTIC REGRESSION: 3+ DOSES OF SP/FANSIDAR AS PART OF INTERMITTENT PREVENTIVE TREATMENT OF MALARIA DURING PREGNANCY

	ODDS RATIO	[95% CONF.	INTERVAL]	P>T	PR(Y=1)
Mother's age					
15–24 years	1.000				19.1%
25–34 years	1.159	0.946	1.420	0.154	21.2%
35–49 years	1.443	1.087	1.916	0.011	24.6%
Woman's education					
None	1.000				18.9%
Primary	1.167	0.726	1.875	0.522	21.2%
Secondary or higher	1.844	1.319	2.578	0.000	28.8%
Islamic	1.038	0.370	2.913	0.944	19.4%
Husband's education					
None	1.000				17.3%
Primary	1.823	1.153	2.883	0.010	26.5%
Secondary	1.491	0.966	2.303	0.071	23.1%
Tertiary	1.652	1.060	2.573	0.027	24.8%
Islamic	1.337	0.463	3.865	0.590	21.4%
Wealth quintile					
Lowest	1.000				18.4%
Second	1.150	0.800	1.654	0.447	20.4%
Middle	1.269	0.880	1.829	0.201	21.8%
Fourth	1.228	0.824	1.832	0.311	21.3%
Highest	1.284	0.854	1.931	0.228	22.0%
Kebbi					
No	1.000				18.8%
Yes	2.275	1.428	3.624	0.001	32.2%
Sokoto					
No	1.000				20.7%
Yes	1.153	0.743	1.790	0.523	22.9%
Wave					
Baseline	1.000				22.3%
Endline	0.847	0.594	1.207	0.356	19.8%

	ODDS RATIO	[95% CONF.	INTER-VAL]	P>T	PR(Y=1)
Exposed to any malaria jingle					
No	1.000				20.5%
Yes	1.085	0.770	1.529	0.640	21.7%
Participation in event with CV					
No	1.000				21.2%
Yes	0.822	0.497	1.359	0.443	18.4%
Household visited by CHW					
No	1.000				20.6%
Yes	1.308	0.906	1.887	0.150	24.7%
Equality index					
0	1.000				16.7%
1	1.428	0.495	4.113	0.508	21.6%
2	1.452	0.536	3.932	0.461	21.8%
3	1.458	0.509	4.173	0.480	21.9%
4	1.165	0.413	3.287	0.771	18.7%
Pregnant women should sleep under a net every night					
Disagree/DK	1.000				17.1%
Agree	1.343	0.812	2.220	0.249	21.2%
When a pregnant woman gets malaria, it could affect the fetus					
Disagree/DK	1.000				21.3%
Agree	0.988	0.549	1.779	0.969	21.1%
Medicine given to pregnant women works well to prevent malaria					
Disagree/DK	1.000				3.2%
Agree	9.448	4.032	22.138	0.000	21.7%
Facilities in my community often have treatment needed					
Disagree/DK	1.000				18.0%
Agree	1.296	0.952	1.766	0.099	21.7%
Confident to start a conversation with husband about ANC					
Disagree/DK	1.000				14.5%
Agree	1.734	0.917	3.276	0.090	21.8%
Confident to get to facility for ANC					
Disagree/DK	1.000				10.5%
Agree	2.760	1.545	4.930	0.001	23.2%
Intercept	0.003	0.001	0.012	0.000	
Obs	5485				
Design df	186				
F(29,158)	6.67				
Prob>F	0.000				

11.3 Exclusive Breastfeeding

In these regression models, we examined factors associated with the likelihood that a mother exclusively breastfeeds her child for the first six months of life. Given the sharp declines in exclusive breastfeeding rates from baseline to endline, this seemed to be a particularly important behavior on which to focus.

As with the other behaviors that were considered, several types of ideational factors including a woman's beliefs, attitudes, and norms, stand out as statistically significant in connection with the probability of exclusive breastfeeding, several factors:

1. Knowledge matters: Women with more accurate knowledge of the timing and value of exclusive breastfeeding were unsurprisingly more likely to report exclusive breastfeeding their most recently born child for the first six months of life. For example, women who were in agreement that breastmilk contains essential nutrients for the first six months of life were more likely to exclusively breastfeed their infants. The adjusted probability for these women was 35.2%, as compared to 20.9% among those who disagreed or did not know. This finding held as well for the value that women placed on exclusive breastfeeding. Holding the belief that it's important to only give a child breastmilk in the first six months was also associated with a higher likelihood of exclusive breastfeeding. Women agreeing with this statement showed an adjusted probability of 37.0%, compared to 23.0% among those who disagreed or didn't know.
2. Self-efficacy: A mother's belief in her ability to successfully breastfeed her infant exclusively for the recommended six months is clearly a critical component to ensuring the uptake and adherence to this behavior. In the regression modeling, women who felt confident to exclusively breastfeed their child were twice as likely to do so, with an adjusted probability of 40.6% compared to 20.1% among those who felt less confident.
3. Lack of self-efficacy to exclusively breastfeed seems to be widespread in northwestern Nigeria, at least in Kebbi and Sokoto, where at endline fewer than half of mothers felt confident that they could exclusively breastfeed their child for the first six months (Kebbi: 43.7%, Sokoto: 44.1%). In this context, self-efficacy is likely to encompass not just the physical act of breastfeeding, but also navigating potential challenges such as latching issues, perceived insufficient milk supply, dealing with societal pressures, and managing any potential medical or physical issues that might arise for either the mother or the baby. As posited by Albert Bandura as part of his Social Cognitive Theory, higher self-efficacy can lead to greater effort, persistence, and resilience in the face of obstacles, which in this context could translate to higher rates of exclusive breastfeeding.
4. Interestingly, many women, approximately four in ten in Kebbi and Sokoto, also do not feel confident to start a conversation with their husbands about breastfeeding. This is perhaps a bit perplexing as women who say that their husbands influence their breastfeeding decisions are more likely to exclusively breastfeed than women who are not so influenced (35.4% versus 30.9%). The size of this effect, however, is small (4.5 pp) and not statistically significant.
5. In short, relative to other attitudinal factors, self-efficacy appears to be an important, and perhaps the most important, factor in determining breastfeeding practices, although it is important to note that these factors are often interconnected. Knowledge can shape beliefs and norms, which in turn can affect self-confidence. For example, agreement that breastmilk contains essential nutrients for the first six months of life (an element of knowledge) had a significant impact on breastfeeding outcomes (adjusted probability of 35.2%). Similarly, normative beliefs about the importance of exclusive breastfeeding in the first six months also showed a significant impact (adjusted probability of 37.0%).
6. Influencers: While husbands appear to have a positive influence on breastfeeding, health providers seem to be much more impactful. Being influenced in breastfeeding by a health provider increased the likelihood of breastfeeding by nearly 20 pp, from 33.4% to 52.2%. Unfortunately, at endline very few women—3.0% in Kebbi, 0.5% in Sokoto, and 3.5% in Zamfara—reported that their breastfeeding decisions were influenced by a health providers. Therefore, increasing the assistance of or increasing access to health providers in facilitating breastfeeding for mothers could have sizable impacts. An expanded role for health care providers, perhaps in home visits, could include additional education about the benefits of breastfeeding, hands-on assistance, and positive and support, as well societal policies and norms that support and facilitate breastfeeding.

7. Education: A woman's formal schooling did not appear to be associated with a greater likelihood of exclusive breastfeeding, but women with Islamic educational backgrounds were 11 pp more likely (43.5% versus 32.5%) to exclusive breastfeed than women with no formal schooling. Women whose husbands had tertiary education were more likely to exclusively breastfeed, with an adjusted probability of 47.8%, compared to 35.6% among women whose husbands had no education.
8. Region: Residing in Kebbi or Sokoto regions was associated with lower likelihood of exclusive breastfeeding, with adjusted probabilities of 24.9% and 25.9%, respectively.
9. Survey wave: The endline survey wave showed a lower likelihood of exclusive breastfeeding (28.0%) compared to the baseline (38.9%).

In conclusion, norms, attitudes, and beliefs, specifically those pertaining to the benefits of breastfeeding and self-confidence in the ability to breastfeed, appear to be important factors associated with exclusive breastfeeding. The husband's education level, influence of health providers, and regional differences also contribute significantly to the likelihood of exclusive breastfeeding. These findings underline the importance of tailored health education and supportive environments in promoting optimal infant feeding practices.

Based on this regression model, while self-confidence appears to be the most impactful individual factor, a comprehensive approach that aims to enhance knowledge, reshape norms and beliefs, and boost self-confidence is likely to be most effective in promoting exclusive breastfeeding.

TABLE 11.3. LOGISTIC REGRESSION: EXCLUSIVE BREASTFEEDING

	ODDS RATIO	[95% CONF.	INTER-VAL]	P>T	PR(Y=1)
Mother's age					
15–24 years	1.000				30.6%
25–34 years	1.511	0.979	2.333	0.062	37.6%
35–49 years	1.064	0.571	1.982	0.843	31.6%
Woman's education					
None	1.000				32.5%
Primary	1.133	0.538	2.388	0.741	34.5%
Secondary or higher	0.828	0.364	1.885	0.651	29.5%
Islamic	1.937	0.485	7.739	0.348	43.5%
Husband's education					
None	1.000				35.6%
Primary	0.607	0.242	1.520	0.285	27.0%
Secondary	1.291	0.702	2.373	0.410	40.3%
Tertiary	1.927	1.015	3.660	0.045	47.8%
Islamic	0.365	0.104	1.283	0.115	19.5%
Wealth quintile					
Lowest	1.000				27.6%
Second	1.442	0.740	2.809	0.280	33.6%
Middle	1.794	0.889	3.621	0.102	37.4%
Fourth	1.895	0.887	4.047	0.098	38.3%
Highest	1.341	0.597	3.013	0.475	32.4%
Kebbi					
No	1.000				35.9%
Yes	0.512	0.277	0.945	0.033	24.9%
Sokoto					
No	1.000				36.5%
Yes	0.530	0.302	0.931	0.027	25.9%
Wave					
Baseline	1.000				38.9%
Endline	0.528	0.282	0.990	0.046	28.0%

	ODDS RATIO	[95% CONF.	INTER-VAL]	P>T	PR(Y=1)
Any Breakthrough ACTION/Nigeria Intervention					
No	1.000				35.4%
Yes	0.885	0.566	1.383	0.589	33.3%
Equality index					
0	1.000				78.8%
1	0.058	0.008	0.444	0.006	32.6%
2	0.063	0.009	0.444	0.006	33.9%
3	0.072	0.010	0.524	0.010	36.2%
4	0.051	0.007	0.380	0.004	30.6%
Who influences your decision to breastfeed?					
Partner					
No	1.000				30.9%
Yes	1.310	0.791	2.169	0.292	35.4%
Mother-in-law					
No	1.000				34.8%
Yes	0.607	0.303	1.218	0.159	26.7%
Mother					
No	1.000				34.0%
Yes	1.092	0.449	2.653	0.846	35.5%
Health provider					
No	1.000				33.4%
Yes	2.866	1.243	6.611	0.014	52.2%
Knows ideal age to start complementary feeding					
No	1.000				28.7%
Yes	1.468	0.766	2.814	0.246	35.0%
Breastmilk contains essential nutrients for first 6 months of life					
Disagree/DK	1.000				20.9%
Agree	2.485	1.097	5.628	0.029	35.2%
Mother's breastmilk after birth is bad milk					
Disagree/DK	1.000				34.8%
Agree	0.846	0.469	1.525	0.576	31.9%
Most women in my community only give infants breastmilk					
Disagree/DK	1.000				32.2%
Agree	1.214	0.778	1.895	0.391	35.5%
Important to only give child breastmilk in first 6 months					
Disagree/DK	1.000				23.0%
Agree	2.323	1.293	4.174	0.005	37.0%
Confident to exclusively breastfeed your child					
Disagree/DK	1.000				20.1%
Agree	3.280	1.716	6.270	0.000	40.6%
Confident to start conversation w/husband about breastfeeding					
Disagree/DK	1.000				37.7%
Agree	0.779	0.450	1.351	0.373	33.5%
Intercept	0.496	0.063	3.892	0.502	
Obs	1287				
Design df	183				
F(29,158)	4.74				
Prob>F	0.000				

12. Conclusion and Recommendations

Impact—integrated versus vertical SBCC programs

The results of this study suggest that integrated social and behavior change (SBC) interventions may be more effective in achieving broader changes in health behaviors as compared with vertical SBC approaches. However, it is important to consider the complexity of this type of real-world quasi-experimental evaluation that must try to parse out the effects of the SBC program from all of the countless other influences affecting health and behaviors, particularly those that differ from one state to the next. External factors such as previous and ongoing health interventions implemented and or funded by other stakeholders, availability, and stock out of commodities, host government support and receptivity, may also exert some influence and contribute at least in part to some of the observed differences.

To compare integrated versus vertical program performance, we examine malaria indicators for both integrated and vertical states, since malaria was implemented across both categories. However, it is worth noting that the more recent mass LLIN distribution in the malaria-only state (Zamfara-2020) may have influenced these results when compared to the integrated states that had distributions in 2018 (Kebbi) and 2017 (Sokoto), according to the MICS survey 2021.

LLIN-related indicators

The ownership of LLINs has shown varying trends across the states of Kebbi, Sokoto, and Zamfara. While LLIN ownership decreased significantly in Kebbi and Sokoto, it witnessed a notable increase in Zamfara. Similarly, the percentage of households with one LLIN for every two persons decreased in Kebbi and Sokoto but showed an increase in Zamfara. The percentage of the population that could sleep under an LLIN if each net was used by two persons also decreased in Kebbi and Sokoto, while it increased in Zamfara. On a positive note, there has been substantial improvement in all three states in the percentage of pregnant women and children under the age of two sleeping under LLINs in households with at least one LLIN.

Regarding malaria ideations, progress has been made in both Sokoto and Zamfara regarding malaria-related attitudes, norms, and behaviors. However, the impact of interventions has varied between the states, with Kebbi showing greater overall improvement and more specific positive changes in attitudes and behaviors related to malaria prevention and treatment.

Treatment of malaria related fever cases

The data reveals varying patterns in the formal care-seeking behavior, utilization of rapid diagnostic tests (RDT), administration of ACT for malaria fever treatment, and the timing of seeking treatment among children with fever in three Nigerian states: Kebbi, Sokoto, and Zamfara.

In Kebbi, there has been a significant decrease in the proportion of children seeking formal care for fever, dropping from 59% to 28%. Similarly, the percentage of children receiving RDT decreased from 23% to 15%, and the administration of ACT for malaria fever treatment decreased from 29% to 24%. However, there was an increase in the proportion of children seeking treatment on the same day or the next day, rising from 62% to 81%.

In Sokoto, the formal care-seeking behavior for children with fever increased from 34% to 40%. The percentage of children receiving RDT also increased from 17% to 25%. The administration of ACT for malaria fever treatment experienced an increase from 18% to 27%. However, there was a decrease in the proportion of children seeking treatment on the same day or the next day, declining from 65% to 61%.

In Zamfara, the proportion of children seeking formal care for fever decreased from 35% to 32%. However, the percentage of children receiving RDT increased from 24% to 30%. Both the administration of ACT for malaria fever treatment (36% at baseline, 35% at endline) and prompt treatment- seeking remained largely unchanged (71% at baseline, 70% at endline).

Overall, these findings highlight the need for further investigation into the factors influencing formal care-seeking behavior and the utilization of appropriate diagnostic and treatment practices for children with fever. The variations observed across the three states

suggest the importance of tailoring interventions to address specific challenges in each region. Efforts should be made to promote timely and appropriate care-seeking, improve access to RDT, and ensure the administration of ACT as recommended. Additionally, strategies to address any barriers to seeking prompt treatment, particularly in Sokoto and Zamfara, should be explored to enhance healthcare outcomes for children with fever in these areas.

Recommendation for Breakthrough ACTION/ Nigeria

1. Intensify behavior change communication: Promote consistent use of LLINs. While most women are aware of the preventive benefits of sleeping under a mosquito net, reinforce the importance of consistent and correct usage, particularly for children under five and pregnant women. Use persuasive messaging highlighting the protective role of nets and address any barriers to their consistent use.
2. Enhance community engagement: Foster community involvement and ownership in LLIN programs by engaging community leaders, volunteers, and local organizations. Promote the establishment of community-level LLIN distribution points, encourage community members to take responsibility for LLIN maintenance, and raise awareness through community-led initiatives.
3. Improve targeting of vulnerable populations: Prioritize pregnant women and households with young children in LLIN distribution efforts. Collaborate with ANC clinics, maternity centers, and child healthcare facilities to ensure continuous distribution of LLINs and provide regular education on proper utilization, net care and maintenance by pregnant women and households with children under the age of two.
4. Reinforce accurate knowledge: Although most mothers correctly identified mosquito bites as the primary mode of malaria transmission, there were some instances of incorrect beliefs. Conduct targeted communication campaigns emphasizing accurate information on transmission, debunking misconceptions such as eating dirty food or getting wet in the rain as causes of malaria.
5. Address persistent misconceptions: In Sokoto and Zamfara, where certain beliefs and behaviors require improvement, tailor communication interventions to tackle specific misconceptions. For example, focus on emphasizing the significance of seeking healthcare providers promptly for child fever and the availability of medicines in health facilities.
6. Enhance understanding of malaria testing: Capitalize on Zamfara's progress in recognizing the need for a blood test to confirm malaria. Conduct targeted campaigns to further educate communities on the importance of testing, address concerns about false negatives, and promote adherence to testing guidelines.
7. Strengthen provider based SBCC: Collaborate with healthcare providers to reinforce accurate information and encourage the adoption of evidence-based practices related to malaria prevention and treatment. Strengthen their role as trusted sources of information, addressing any gaps in knowledge or misconceptions they may have.
8. Promote training and capacity building: Provide healthcare providers with training on the diagnosis and management of fever in children. Emphasize the use of RDT and the appropriate administration of ACT. Promote the adoption of evidence-based guidelines for malaria fever management. Continuous professional development programs can ensure healthcare providers stay updated with best practices.

Recommendations for USAID

1. Promote Integrated SBC Interventions: Governments and organizations should consider prioritizing integrated SBC interventions to achieve broader improvements in health behaviors. The study suggests that integrated approaches have the potential to be more effective compared to vertical SBC approaches. Integrated programming should focus on targeting multiple health areas simultaneously to address interconnected behaviors and promote holistic health outcomes.
2. Further Research and Evaluation: More research and evaluation studies are needed to gain a deeper understanding of the effectiveness of integrated versus vertical SBC approaches in different contexts. This will help identify best practices and strategies for improving health behaviors, including the use of appropriate methodologies and rigorous evaluation designs to assess the impact of interventions.

3. Strengthen LLIN distribution and access: Encourage harmonized LLIN distribution to complement other programming initiatives such as the SBCC component of health intervention implemented in these states. Advocate and strengthen timely LLIN campaigns and routine distribution systems to complement other related initiatives to promote health and wellbeing.
4. Strengthen supply chain management: Ensure a consistent supply of LLINs and other malaria commodities through effective supply chain management systems. Coordinate with manufacturers and logistics implementing partners to maintain an adequate stock of LLINs and promptly address any shortages.

Modern contraception

The findings regarding the intention to use modern contraceptives and current family planning use reveal varying trends across the states of Kebbi, Sokoto, and Zamfara. The intention to use modern contraceptives decreased in Kebbi, increased in Sokoto, and showed improvement in Zamfara. Similarly, current family planning use increased in Kebbi, decreased in Sokoto, and increased in Zamfara. Furthermore, the analysis of postpartum family planning use indicates a positive trend in Kebbi and Zamfara, with an increase observed in both states. However, Sokoto experienced a decline in postpartum family planning use during the same period.

Examining contraceptive beliefs, attitudes, and myths, the study evidenced a nuanced picture with mixed findings across different indicators.

In terms of injunctive norms, there was an increase in women's approval of contraception for birth spacing in Sokoto, while it remained largely unchanged in Kebbi. However, the differences between these integrated states and Zamfara were not statistically significant.

The importance of discussing family planning among couples slightly increased in Sokoto and significantly increased in Zamfara. In Kebbi, there was no notable change in this aspect. Furthermore, women in all three states became more likely to agree that couples using family planning have a better quality of life, but the increase was more significant in Zamfara.

Regarding the perception of social stigma, there was little change across the three states. The percentage of women who believed that they would be called bad names in the community if they were known to use contraception remained relatively stable.

In terms of contraceptive knowledge and myths, there were no clear patterns of greater improvements in the integrated states compared to Zamfara. The belief that side effects are normal and usually go away increased in all three states, with Zamfara experiencing the largest increase. However, some indicators related to contraceptive myths worsened in the integrated states but worsened to a greater extent in Zamfara.

There were some positive findings in Kebbi compared to Zamfara, including decreasing agreement with certain contraceptive myths, but none of these findings were statistically significant. In terms of perceived benefits, the percentage of women citing no benefits to the mother from using contraception decreased slightly in all three states. The most cited benefits for mothers were "rest after birth" and "better health." Kebbi had large increases in reporting specific benefits to mothers and children that were not observed in the other two states.

The study's findings underscore the complex and context-specific nature of family planning behaviors and beliefs across the states of Kebbi, Sokoto, and Zamfara. While some positive changes in contraceptive intentions and beliefs were observed, the variations and lack of statistical significance highlight the need for targeted and tailored approaches to address family planning challenges in each state. These findings emphasize the importance of contextually informed interventions that consider local dynamics and cultural factors to effectively promote and support family planning initiatives.

Recommendations for Breakthrough ACTION/ Nigeria

1. Address cultural and social barriers: Conduct culturally sensitive campaigns and interventions that address cultural and social norms surrounding family planning and contraceptive use. Engage with community leaders, religious institutions, and influential community members to promote positive attitudes and acceptance of family planning practices.
2. Promote male involvement: Engage men as key partners in family planning initiatives by providing information, education, and counseling on the benefits of contraceptive use. Encourage men to actively participate in family planning decision-making and

support their partners in adopting modern contraceptive methods.

3. Addressing Injunctive Norms: Since there was an increase in women's approval of contraception for birth spacing in Sokoto but not in Kebbi, targeted behavior change communication efforts can be implemented in Kebbi to promote positive attitudes toward contraception. These efforts should focus on highlighting the benefits of birth spacing and addressing any misconceptions or concerns that may be contributing to the lack of change in approval.
4. Enhancing Couples' Communication: Given that the importance of discussing family planning among couples increased significantly in Zamfara, similar efforts can be encouraged in Sokoto and Kebbi. Behavior change communication programs should emphasize the benefits of open communication between partners regarding family planning decisions. This can include promoting dialogue, providing communication tools, and addressing barriers to effective communication.
5. Addressing Social Stigma: Although there was little change in the perception of social stigma across the three states, it is important to continue efforts to reduce stigma associated with contraceptive use. Behavior change communication campaigns should aim to challenge negative societal attitudes and misconceptions surrounding contraception. Highlighting the positive impact of family planning on individuals and communities can help counteract stigmatizing beliefs.
6. Tackling Contraceptive Knowledge and Myths: Since there were no clear patterns of improvement in the integrated states compared to Zamfara, it is crucial to address contraceptive myths and misconceptions in all three states. Behavior change communication interventions should focus on providing accurate information about contraception, debunking common myths, and promoting a better understanding of the side effects and benefits associated with different contraceptive methods.
7. Promoting Perceived Benefits: Given the decrease in the percentage of women citing no benefits to the mother from using contraception, behavior change communication efforts should continue to highlight the advantages of contraception for maternal health and well-being. Emphasizing benefits such as postpartum rest, improved health, and better child growth can strengthen the perceived value of contraception among women in these regions.

Recommendations for USAID

1. Strengthen postpartum family planning services: Develop targeted interventions to improve postpartum family planning use, particularly in Sokoto. Integrate family planning services within maternal and child healthcare settings, ensuring that women receive counseling and access to contraceptives during pregnancy and immediately after childbirth.
2. Foster collaboration and coordination: Establish strong partnerships between government agencies, non-governmental organizations, community-based organizations, and other stakeholders involved in family planning. Coordinate efforts, share best practices, and leverage resources to maximize the impact of family planning programs.
3. Promote policy and advocacy: Advocate for policies that support access to family planning services and remove barriers to contraceptive use. Collaborate with policymakers, civil society organizations, and advocacy groups to raise awareness about the importance of family planning and prioritize it as a public health and development issue.
4. Empower women and girls: Prioritize efforts to empower women and girls by promoting education, economic opportunities, and reproductive rights. Ensure that women have access to information, resources, and support to make informed choices about their reproductive health. Integrate programs targeted at empowering women in similar locations where reproductive health projects are funded, this will help projects to leverage.

Antenatal care and delivery

The findings regarding maternal health indicators demonstrate mixed progress across the states of Kebbi, Sokoto, and Zamfara. The percentage of pregnant women who took three doses of IPTp increased significantly in Kebbi, remained relatively stable in Sokoto, and showed a modest improvement in Zamfara. Similarly, there was an increase in the proportion of pregnant women attending four or more ANC visits in Kebbi and Zamfara, while Sokoto experienced a slight increase.

Furthermore, the analysis of birth planning and delivery in health facilities indicates positive trends in Kebbi and

Zamfara. The percentage of pregnant women making birth plans increased in all three states, with notable improvements observed in Kebbi and Zamfara. However, the percentage of women delivering in health facilities declined slightly in Sokoto, while Kebbi and Zamfara saw an increase.

The study examined the influence of husbands and other family members on ANC decision-making, as well as women's perceptions of ANC benefits and myths in three states: Kebbi, Sokoto, and Zamfara. The findings revealed that husbands played a crucial role in ANC utilization, with the majority of women reporting their husband's influence on making 4 or more ANC visits. Mothers-in-law and mothers also had some influence, although to a lesser extent. The importance of discussing pregnancies with husbands increased in all three states, and women's confidence in initiating conversations about ANC also improved. Confidence in getting to a health facility for ANC also increased across all states. Most women expressed their intention to make 4 or more ANC visits for future pregnancies.

Regarding ANC benefits and myths, common maternal benefits were acknowledged by over 50% of respondents, such as monitoring the mother's health and the baby's growth. However, there were still prevalent myths about ANC, and agreement with these myths increased in Sokoto and Zamfara. In Kebbi, there were improvements, with a decline in the agreement with ANC-related myths. For example, the belief that only first-time pregnant mothers need ANC decreased in Kebbi but increased in Zamfara. Similarly, in Kebbi, there was a greater agreement that health facilities are the best place to deliver a baby, while in Sokoto, there was an increase in the belief that traditional providers are better for ANC.

These findings suggest that efforts to improve maternal health outcomes have yielded positive results in certain areas. However, challenges persist, particularly in ensuring consistent access to quality healthcare services during pregnancy and delivery. Strategies should be implemented to address the barriers that contribute to low IPTp coverage, suboptimal ANC attendance, and limited facility-based deliveries, especially in Sokoto.

The study also highlights the significant influence of husbands on ANC decision-making and the importance of spousal communication. Efforts should be made to further strengthen the involvement of husbands and other family members in ANC discussions and decision-making processes. Women's confidence in initiating conversations and accessing health facilities for ANC should be encouraged and supported through targeted behavior change communication strategies. Moreover, interventions are needed to address prevalent ANC myths, particularly in states where agreement with these myths increased. Promoting accurate knowledge about ANC benefits and debunking misconceptions is crucial to improve maternal and child health outcomes. By addressing these factors, ANC utilization and the overall quality of care can be enhanced, ultimately contributing to improved maternal and child health in Kebbi, Sokoto, and Zamfara.

Recommendation for Breakthrough ACTION/ Nigeria

1. Address socio-cultural and economic barriers: Identify and address socio-cultural and economic factors that hinder women's access to maternal healthcare services. This may involve community engagement and mobilization efforts to challenge harmful norms and practices, promote gender equality, and address financial constraints that limit women's ability to seek and utilize maternal health services.
2. Strengthen birth planning and delivery in health facilities: Scale up interventions that promote birth planning, including educating pregnant women and their families about the importance of creating birth plans. Collaborate with traditional birth attendants and community health workers to facilitate referrals to health facilities for skilled delivery care.
3. Promote community awareness and education: Conduct community awareness campaigns to promote the importance of maternal health and encourage community support for pregnant women. Utilize various communication channels, including mass media, community meetings, and local influencers, to disseminate information about ANC, IPTp, birth planning, and the benefits of facility-based deliveries.
4. Spousal communication Enhancement: Develop behavior change communication campaigns that emphasize the importance of spousal involvement in ANC decision-making and encourage open and supportive communication between couples. Highlight the positive impact of joint decision-making on maternal and child health outcomes. Utilize various communication channels, such as community

gatherings, radio programs, and social media, to reach both men and women with these messages.

5. Family Involvement: Extend behavior change communication efforts to involve other family members, including mothers-in-law and mothers, in ANC discussions. Educate them about the benefits of ANC and their role in supporting pregnant women's health. Address any misconceptions or myths they may hold and promote their active participation in ANC decision-making processes.
6. Confidence Building: Develop communication materials and interventions that focus on building women's confidence in initiating conversations about ANC with their husbands. Provide practical tips and guidance on effective communication strategies, including active listening and expressing needs and concerns. Empower women to take an active role in their healthcare decision-making process.
7. Myth Debunking: Design targeted behavior change communication interventions to address prevalent ANC myths and misconceptions. Use evidence-based messaging to dispel myths such as "ANC is only necessary for first-time mothers" and "traditional providers are better than health facilities." Utilize community influencers, local media, and community dialogues to disseminate accurate information and challenge misconceptions.

Recommendation for USAID

1. Strengthen health system governance: Enhance health system governance to ensure efficient allocation of resources, effective implementation of policies and guidelines, and transparent and accountable management of maternal health programs. This includes strengthening leadership, health workforce capacity, and health information systems.

Newborn care

The findings regarding newborn care practices reveal varying trends across the states of Kebbi, Sokoto, and Zamfara. The percentage of newborns placed on their stomach immediately after birth increased in Kebbi and Zamfara, while Sokoto experienced a decline. Similarly, the use of Chlorhexidine to clean the umbilical cord showed improvements in Kebbi and Zamfara but remained relatively stable in Sokoto. On the other hand, the use of misoprostol to stop bleeding after birth increased in Kebbi and Zamfara, while Sokoto saw a slight decrease.

These findings highlight both positive changes and areas of concern in newborn care practices. Placing the baby on the stomach immediately after birth is important for newborn health, as it helps with breathing and bonding, and the increase in Kebbi and Zamfara is promising. However, efforts should be made in Sokoto to promote this practice and ensure consistent implementation.

The use of Chlorhexidine for cord cleaning is an effective intervention in preventing infections, and the improvements in Kebbi and Zamfara are encouraging. However, further efforts are needed to increase the uptake in Sokoto and maintain progress in the other states.

The use of misoprostol to prevent postpartum bleeding has shown significant improvement in Kebbi and Zamfara, indicating increased awareness and access to this life-saving intervention. However, Sokoto's decrease and relatively low utilization in all three states highlight the need for targeted interventions and awareness campaigns to ensure its widespread use.

Overall, these findings emphasize the importance of continuous efforts to promote and ensure the adoption of evidence-based newborn care practices across all three states, with particular attention to Sokoto. By prioritizing these practices, the states can contribute to reducing neonatal mortality and improving the overall health and well-being of newborns.

Recommendations for Breakthrough ACTION/ Nigeria

1. Strengthen newborn care education and training: Develop and implement comprehensive newborn care education programs for healthcare providers, including training on evidence-based practices such as immediate skin-to-skin contact, safe cord care, and the use of misoprostol for preventing postpartum bleeding. Emphasize the importance of these practices in improving newborn health outcomes.
2. Promote community awareness and engagement: Conduct community awareness campaigns to educate families and community members about the importance of newborn care practices. Utilize various communication channels, community meetings, and local influencers to disseminate information and address cultural beliefs and misconceptions.

3. Improve healthcare provider adherence to best practices: Implement supportive supervision and mentoring programs to ensure healthcare providers consistently adhere to recommended newborn care practices. Monitor and provide feedback on their performance, address any gaps in knowledge or implementation, and recognize and reward adherence to best practices.

Recommendation for USAID

1. Advocacy to government: Advocate to government at state levels to strengthen health system infrastructure by ensuring that healthcare facilities have the necessary infrastructure, supplies, and equipment to support newborn care practices. This includes providing clean delivery surfaces, sufficient supplies of Chlorhexidine for umbilical cord care, and appropriate storage and administration of misoprostol.

Infant Nutrition and Breastfeeding

The rates of immediate breastfeeding and exclusive breastfeeding have declined in the states of Kebbi, Sokoto, and Zamfara. In Kebbi, immediate breastfeeding decreased from 42% to 39%, and exclusive breastfeeding decreased from 20% to 17%. In Sokoto, immediate breastfeeding decreased from 32% to 24%, and exclusive breastfeeding decreased from 29% to 11%. In Zamfara, immediate breastfeeding declined from 46% to 43%, and exclusive breastfeeding decreased from 46% to 37%. These findings indicate a concerning trend of reduced breastfeeding rates in these regions, which may have implications for infant health and nutrition. Efforts should be made to raise awareness and provide support for breastfeeding to improve the overall well-being of infants in these areas.

Recommendations to Breakthrough ACTION/ Nigeria

1. Promote breastfeeding education and counseling: Implement comprehensive breastfeeding education programs targeting pregnant women, new mothers, and their families. Provide accurate and culturally appropriate information on the benefits of breastfeeding, proper breastfeeding techniques, and the importance of exclusive breastfeeding for the first six months of life. Ensure that healthcare providers receive training on lactation support and counseling.
2. Establish breastfeeding support groups: Create community-based breastfeeding support groups where mothers can connect with each other, share experiences, and receive guidance and encouragement from trained peer counselors. These support groups can provide a safe space for mothers to discuss breastfeeding challenges, receive practical tips, and gain emotional support.
3. Ensure access to skilled lactation support: Train and deploy skilled lactation consultants, counselors, and community health workers to provide ongoing lactation support to mothers in healthcare facilities and the community. Ensure their availability and accessibility to provide guidance, address challenges, and promote successful breastfeeding practices.
4. Strengthen the Baby-Friendly Community Initiative: Extend the principles of the Baby-Friendly Hospital Initiative to the broader community by implementing the Baby-Friendly Community Initiative. Engage community leaders, religious institutions, and local organizations in promoting and supporting breastfeeding through community-wide campaigns, awareness programs, and supportive policies.

Recommendation for USAID

1. Advocate for breastfeeding-friendly public spaces: Advocate for the establishment of breastfeeding-friendly spaces in public areas, such as parks, shopping centers, and transportation hubs, where mothers can comfortably breastfeed their infants without facing stigma or discrimination. Promote a breastfeeding-positive culture that normalizes breastfeeding in public.

Childhood vaccination

There have been mixed trends in child vaccination rates across the states of Kebbi, Sokoto, and Zamfara. In Kebbi, child vaccination increased significantly from 2.4% to 5.8%. In Sokoto, there was a slight decrease from 3.0% to 2.7% in child vaccination rates. On the other hand, Zamfara experienced an increase in child vaccination from 5.9% to 10.3%. While the overall picture shows progress in child vaccination coverage, it is important to note that the rates are still relatively low in all three states. Continued efforts are necessary to further improve and expand child vaccination programs, especially in Sokoto, where the rates have decreased slightly. Increasing vaccination rates will contribute to the overall

health and well-being of children in these areas, reducing the risk of preventable diseases and promoting stronger immune systems.

Recommendations for Breakthrough ACTION/ Nigeria

1. Enhance community engagement and awareness: Conduct community awareness campaigns to educate caregivers about the importance of child vaccination and address any misconceptions or concerns. Engage community leaders, religious institutions, and local organizations to promote vaccination and dispel myths or rumors surrounding vaccines. Utilize community health workers to provide education and support at the grassroots level.
2. Improve data collection and monitoring: Enhance the data collection and monitoring systems to accurately track vaccination coverage and identify areas with low immunization rates. Use real-time data to identify gaps, target interventions, and measure the impact of vaccination programs. Regularly evaluate the performance of vaccination campaigns and adjust strategies as needed.
3. Address vaccine hesitancy: Address vaccine hesitancy by engaging with communities and addressing their concerns about vaccines. Provide transparent and evidence-based information to build trust and confidence in vaccination programs. Communicate the safety and effectiveness of vaccines, highlighting their role in preventing diseases and safeguarding children's health.

Recommendation for USAID

1. Strengthen and promote targeted vaccination campaigns among implementing partners: Implement targeted vaccination campaigns to reach populations that may have limited access to routine immunization services. This includes conducting outreach programs in remote areas, marginalized communities, and areas with low vaccination rates. Mobile vaccination units can be utilized to provide immunization services in hard-to-reach areas.
2. Advocate for sustained investment: Advocate for sustained investment in child vaccination programs at the state and national levels. Allocate adequate financial resources to strengthen immunization systems, procure vaccines, and support training and capacity-building initiatives. Highlight the long-term benefits and cost-effectiveness of vaccination in reducing the burden of preventable diseases.
3. Strengthen collaboration and coordination: Foster collaboration and coordination among key stakeholders, including government agencies, healthcare providers, community-based organizations, and development partners. Establish platforms for regular information sharing, joint planning, and resource mobilization to ensure a coordinated and integrated approach to child vaccination programs.

Childhood illnesses—Treatment

Diarrhea

There have been varying trends in seeking formal care, administration of oral rehydration solution (ORS) for diarrhea, and the provision of both ORS and zinc to children with diarrhea in the states of Kebbi, Sokoto, and Zamfara.

In Kebbi, there was a significant decrease in children seeking formal care from 45% to 21%. Additionally, the percentage of children given ORS for diarrhea decreased from 52% to 48%, but there was an increase in children with diarrhea given both ORS and zinc from 18% to 30%.

In Sokoto, the percentage of children seeking formal care decreased slightly from 36% to 34%. However, there was an increase in the administration of ORS for diarrhea from 27% to 37%. Similarly, the percentage of children with diarrhea given both ORS and zinc increased from 12% to 23%.

In Zamfara, there was a decrease in children seeking formal care from 30% to 27%. The percentage of children given ORS for diarrhea also decreased from 56% to 43%. Furthermore, there was a decrease in children with diarrhea given both ORS and zinc from 27% to 23%.

These findings indicate that while there have been some positive changes in the administration of ORS and ORS-zinc combination in Sokoto and Kebbi, there is a general decline in seeking formal care and the provision of appropriate treatment for diarrhea in all three states. This suggests the need for increased awareness, education, and access to healthcare services for children with diarrhea in these regions.

Timely and appropriate care is crucial for managing and preventing complications associated with diarrhea, and further efforts are necessary to improve the overall

healthcare seeking behavior and treatment practices for children in Kebbi, Sokoto, and Zamfara.

Recommendations for Breakthrough ACTION/Nigeria

1. Enhance community health education: Conduct targeted community health education programs to raise awareness about the importance of seeking formal care for children with diarrhea. Emphasize the benefits of timely medical attention, proper diagnosis, and appropriate treatment to prevent complications and reduce the severity of diarrhea episodes.
2. Promote use of ORS for diarrhea treatment: Implement comprehensive programs to educate caregivers on the correct use and benefits of ORS in managing diarrhea. Emphasize the importance of early initiation of ORS to prevent dehydration and improve outcomes. This can be achieved through community-based health workers, health promotion campaigns, and educational materials tailored to the local context.
3. Strengthen integration of ORS and zinc provision: Ensure that healthcare providers are trained and equipped to provide both ORS and zinc to children with diarrhea. Emphasize the importance of the combined use of ORS and zinc, as zinc supplementation has been shown to reduce the duration and severity of diarrhea episodes. Develop protocols and guidelines for healthcare professionals to ensure the consistent provision of both interventions.

Recommendations for USAID Nigeria

1. Strengthen supply chain management: Ensure the availability and accessibility of ORS and zinc through efficient supply chain management. This includes regular forecasting, procurement, and distribution of these essential commodities to healthcare facilities. Collaborate with relevant stakeholders, such as pharmaceutical companies and development partners, to address any supply chain challenges and ensure a steady supply of ORS and zinc.
2. Conduct research and innovation: Encourage research and innovation in the field of diarrhea management to identify effective strategies for seeking formal care, ORS administration, and the provision of ORS and zinc. Support studies that evaluate the impact of interventions and identify best practices for diarrhea treatment and care.

Acute respiratory infection

There have been contrasting trends in seeking formal care for ARI and the treatment of ARI with antibiotics among children in the states of Kebbi, Sokoto, and Zamfara.

In Kebbi, there was a significant decrease in the percentage of children seeking formal care for ARI from 39% to 28%. However, there was a notable increase in the percentage of children with ARI who were treated with antibiotics, rising from 41% to 63%.

In Sokoto, there was an increase in the percentage of children seeking formal care for ARI from 42% to 50%. Additionally, there was an increase in the percentage of children with ARI treated with antibiotics, increasing from 26% to 38%.

In Zamfara, there was an increase in the percentage of children seeking formal care for ARI from 28% to 32%. However, there was a decrease in the percentage of children with ARI who were treated with antibiotics, declining from 53% to 28%.

These findings suggest that while there has been an increase in seeking formal care for ARI in Sokoto and Zamfara, there is a decrease in Kebbi. However, across all three states, there is an increase in the percentage of children with ARI who are being treated with antibiotics.

Efforts should be made to promote consistent and appropriate seeking of formal care for children with ARI, especially in Kebbi where there has been a decline. It is also important to ensure appropriate use and prescription of antibiotics to prevent the development of antibiotic resistance. Further education and awareness programs can play a crucial role in improving healthcare-seeking behavior and treatment practices for ARI in these regions, ultimately contributing to better health outcomes for children.

Recommendations for Breakthrough ACTION/Nigeria

1. Strengthen healthcare-seeking behavior: Implement targeted awareness campaigns and community education programs to promote the importance of seeking formal care for children with ARI. Emphasize the potential risks associated with self-medication and the benefits of early diagnosis and appropriate treatment. Engage community leaders, healthcare providers, and caregivers to disseminate accurate information and address misconceptions.

2. Enhance healthcare provider training: Provide healthcare providers with training on the appropriate diagnosis and management of ARI in children. Emphasize the importance of evidence-based guidelines and discourage the unnecessary use of antibiotics when not warranted. Promote the implementation of integrated management of childhood illness (IMCI) protocols to ensure standardized and effective care.

Recommendation for USAID

1. Promote antibiotic stewardship: Develop and implement antibiotic stewardship programs to promote responsible use of antibiotics for ARI treatment. Educate healthcare providers, caregivers, and the community about the risks of antibiotic resistance and the importance of using antibiotics judiciously. Encourage the practice of national guidelines for antibiotic prescribing in ARI cases.
2. Strengthen routine monitoring and surveillance: Strengthen and harmonize systems for monitoring and surveillance of ARI cases and antibiotic use. Regularly collect data on healthcare-seeking behavior, antibiotic prescription rates, and antibiotic resistance patterns.

Exposure to *Albishirin Ku!*

The Behavior Change Communication (BCC) programming conducted by Breakthrough ACTION/Nigeria in the integrated states of Kebbi and Sokoto includes various interventions across health areas, utilizing multiple channels such as radio, community events, household visits, opinion leader influencers, and mobile applications. These interventions are predominantly carried out under the branding of ***Albishirin Ku!*** In Zamfara, Breakthrough ACTION/Nigeria focuses on malaria-specific activities and radio spots, without using the ***Albishirin Ku!*** branding. However, the radio programming from Sokoto spills over into Zamfara.

Exposure to Breakthrough ACTION/Nigeria interventions, both branded and unbranded, increased from the baseline to the endline survey in all three states. By the endline, about half of the women in Kebbi, approximately six in ten women in Sokoto, and nearly three-quarters of women in Zamfara reported being exposed to any Breakthrough ACTION/Nigeria or ***Albishirin Ku!*** intervention. Exposure to ***Albishirin Ku!*** radio programming increased in Kebbi and Sokoto states.

In Kebbi, one in ten women reported participating in a Breakthrough ACTION/Nigeria community event/dialogue at the endline, while one in five reported a home visit by a Breakthrough ACTION/Nigeria CV. In Sokoto, reporting of exposure to Breakthrough ACTION/Nigeria community events was lower, with only 12% of women participating in a community dialogue and 10% reporting a home visit by a CV. In Zamfara, very few women reported exposure to branded community dialogues or household visits.

Note: The true levels of exposure may be influenced by respondents' ability to recall specific logos, and the estimates of unbranded and branded exposure serve as bounds for the actual exposure levels.

Recommendations

Social behavior change recommendation

1. Enhance community engagement: To further promote behavior change, it is recommended to strengthen community engagement strategies in all three states. Community events and dialogues should be expanded and conducted regularly to provide platforms for open discussions and knowledge sharing. These events can create opportunities for community members to voice their concerns, ask questions, and receive accurate information related to health behaviors. Active involvement of community leaders, influencers, and volunteers is crucial for organizing and facilitating these dialogues effectively.
2. Increase home visits: Home visits by CVs have shown potential in influencing health behaviors. It is recommended to increase the frequency and coverage of home visits, particularly in areas where exposure to interventions is relatively low, such as Sokoto and Zamfara. These visits provide personalized interactions and allow for tailored messaging based on the specific needs and concerns of households. By addressing individual and household-level barriers to behavior change, home visits can contribute to improved health outcomes.

Policy recommendation

1. Integration of branding: Considering the higher exposure levels to branded interventions, policymakers should encourage the integration of branding strategies, such as ***Albishirin Ku!***, across various health areas and interventions. This branding can help create a recognizable and cohesive identity for behavior change programs, enhancing their visibility

and impact. Branding should be accompanied by effective messaging and consistent use of channels such as radio, community events, and household visits to ensure the delivery of accurate and persuasive information.

2. Cross-state spillover: Recognizing the spill-over effect of interventions from Sokoto to Zamfara through radio programming, policymakers should explore opportunities for coordinated efforts and collaboration among neighboring states. This can involve sharing successful intervention strategies, leveraging existing infrastructure and resources, and adopting best practices. Coordinated programming can maximize the reach and impact of behavior change interventions, especially in areas with limited exposure to specific interventions, as observed in Zamfara.
3. Monitoring and evaluation: It is essential to establish a robust monitoring and evaluation framework to continuously assess the effectiveness of behavior change interventions. Regular data collection and analysis will help identify gaps, measure progress, and inform evidence-based decision-making. This includes monitoring exposure levels, tracking behavior change indicators, and assessing the overall impact of interventions. Findings from monitoring and evaluation efforts can guide programmatic adjustments and resource allocation to optimize the outcomes of social behavior change initiatives.

By implementing this social behavior change and policy recommendations, stakeholders can enhance community engagement, increase exposure to interventions, strengthen branding strategies, encourage cross-state collaboration, and establish effective monitoring and evaluation systems. These efforts will contribute to more impactful behavior change programs and ultimately lead to improved health behaviors and outcomes in the integrated states of Kebbi, Sokoto, and Zamfara.

Appendices

TABLE 1.1.2. HOUSEHOLD CHARACTERISTICS

Percentage of households by characteristics, by baseline and endline rounds

CHARACTERISTIC	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Main source of drinking water						
Improved source	40.0	63.2	23.6	10.8	72.4	86.3
Unimproved source	60.0	36.8	76.4	89.2	27.6	13.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Main sanitation facility						
Improved	20.4	51.9	25.4	38.5	48.4	75.3
Unimproved	79.6	48.1	74.6	61.5	51.6	24.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Main flooring material						
Earth/sand	67.3	60.4	69.1	65.7	53.8	39.0
Ceramic tiles	2.6	1.0	3.0	2.4	6.9	5.8
Cement	30.0	37.6	26.2	31.9	38.7	53.9
Parquet/Polished wood	0.1	0.1	0.1	0.0	0.6	0.0
Other	0.0	0.9	1.6	0.0	0.1	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Main roofing material						
Thatched/Palm leaf	16.8	17.5	21.0	8.7	10.2	5.9
Metal/Iron sheets	83.1	82.5	76.5	91.3	88.5	92.9
Calamine/Cement fiber	0.2	0.0	1.5	0.0	1.0	0.1
Other	0.0	0.0	1.0	0.1	0.3	1.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	892	1,086	1,078	1,007	1,069	991

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

Improved drinking water sources include piped supplies and non-piped supplies (boreholes/tube wells, protected wells and springs, rainwater, packaged water, and delivered water); unimproved drinking water sources include unprotected wells and springs

Improved sanitation facilities include network sanitation and on-site sanitation (flush or pour flush toilets or latrines connected to septic tanks or pits, ventilated improved pit latrines, pit latrines with slabs, composting toilets including twin pit latrines, and container-based systems; unimproved sanitation facilities include on-site sanitation (pit latrines without slabs, hanging latrines, bucket latrines)

TABLE 1.1.3. HOUSEHOLD WEALTH AND ASSETS

Percentage of households by wealth index quintile and asset ownership, by baseline and endline rounds

CHARACTERISTIC	KEBBI		SOKOTO		ZAMFARA	
	BASELINE	ENDLINE	BASELINE	ENDLINE	BASELINE	ENDLINE
	%	%	%	%	%	%
Agricultural						
Livestock, herds, other farm animals, or poultry	71.7	73.3	72.5	63.5	65.8	51.2
Agricultural land	86.5	89.3	88.6	83.3	73.6	65.8
Durables						
Radio	24.2	16.4	27.5	27.8	40.3	45.3
Television	12.5	10.2	9.3	11.2	15.5	31.0
Computer	0.8	0.8	2.4	2.5	2.3	3.4
Bicycle	9.6	11.2	13.0	7.2	17.1	18.2
Motorcycle or scooter	33.5	34.3	26.7	26.3	34.9	34.9
Car or truck	4.3	5.6	5.2	2.8	7.6	7.2
Wealth quintiles						
Lowest	31.7	21.2	36.2	35.4	11.3	6.6
2nd lowest	21.7	25.1	21.3	21.4	19.1	14.3
middle	17.9	22.6	20.5	16.8	21.2	20.1
2nd highest	13.0	18.3	11.0	11.7	23.9	30.7
Highest	15.8	12.8	11.0	14.8	24.4	28.3
N	892	1,086	1,078	1,007	1,069	991

Estimates based on low Ns (approx. <30 obs) have large relative standard errors and should be interpreted with caution.

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