

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

Diet Diversity Among Pregnant Women and Young Children

This brief provides rigorous evidence-based insights to policy makers, implementers, and researchers of social and behavior change (SBC) programs on maternal and child nutrition during the 1,000-day period between a woman's pregnancy and her child's second birthday. This period is well-recognized as a foundational period for promoting optimal growth, good health, and neurological development that will benefit a child across her lifespan. This brief summarizes nutritional intake and diet diversity of pregnant women and young children during this foundational period and examines the ideational and sociodemographic factors associated with higher-quality diets.

It is one of a series of briefs that present findings from a Breakthrough RESEARCH study that uniquely captures data on a wide range of psychosocial drivers of behavioral outcomes in the areas of family planning, malaria, and maternal, newborn, and child health, and nutrition (MNCH+N) in the three northwestern states of Nigeria. The results presented in this series can inform the improvement of women and children's health programming in Nigeria and help to achieve the objectives of the National Strategic Health Development Plan II (2018–2022),¹ as well as support global efforts to achieve the United Nations Sustainable Development Goals.²

Breakthrough RESEARCH and Breakthrough ACTION in Nigeria

Breakthrough RESEARCH and Breakthrough ACTION are USAID's flagship SBC programs. Breakthrough ACTION in Nigeria implements SBC programming in 11 states and the Federal Capital Territory. Breakthrough RESEARCH in Nigeria conducts rigorous research to inform SBC program implementation in three of these program states (Kebbi, Sokoto, and Zamfara). Findings presented here are from a Breakthrough RESEARCH baseline study that are used for informing SBC program adaption and scale-up in Nigeria.

KEY POINTS

Less than half (49%) of pregnant women consumed at least four of eight food groups in the previous 24 hours. Pregnant women living in the wealthiest households and with any formal education had more than 3- and 2-times higher likelihood of consuming 4+ food groups than pregnant women in the poorest households or with no formal education, respectively.

Sociodemographic factors played a significant role in children having higher-quality diets. There was 1.9, 1.2, and 1.8 times higher likelihood of children aged 6–23 months consuming a minimum diet diversity, minimum meal frequency, and minimum adequate diet, respectively, if they lived in wealthiest versus poorest households. This reinforces the well-known role of economic barriers for improved child nutrition.

While most ideational variables were not associated with higher quality diets among children 6–23 months, maternal knowledge about the timing for introducing complementary foods and knowing the signs or symptoms of inadequate child nutrition were significantly associated with having a minimum acceptable diet. Surprisingly, a mother's belief that the first breastmilk after birth (colostrum) is bad milk was positively associated with her child aged 6–23 months receiving a minimum meal frequency in this study, which merits further exploration. Ideational results point to a role for SBC programs to increase knowledge about exclusive breastfeeding, the signs and symptoms of inadequate nutrition in children, and when to introduce complementary foods as a first step to improving nutritional intake in subsequent months.

Nutritional programs may need to specifically address the economic barriers to improved nutrition for pregnant women and young children. This may include linking poor communities to household empowerment or social safety net programs. It may also require the development of local nutritious recipes with locally affordable foods, including trainings on how to prepare such foods, which could help overcome economic barriers to improved nutrition. Multisectoral stakeholder collaborations (e.g., agriculture, health, finance, environment) are also needed to address inadequate nutrition and to shape nutrition program implementation for the poorest communities.

Setting the Context

A growing body of research suggests that the 1,000-day period between a woman’s pregnancy and her child’s second birthday is foundational for promoting optimal growth, good health, and neurological development that will benefit a child across her lifespan.³ Good maternal and child nutrition during the 1,000-day window is a cornerstone of this foundational period.^{3–5} Both before and during pregnancy, insufficient micronutrient intake can negatively affect both the woman and her newborn resulting in higher risks of pregnancy complications, maternal anemia, maternal and perinatal mortality, preterm birth, low birth weight, suboptimal fetal development, as well as contributing to long-term adverse effects on the child’s health and cognitive development.^{4, 6, 7}

Yet, good maternal and child nutrition remains suboptimal in Nigeria.⁸ The 2018 National Nutrition and Health Survey showed that the prevalence of malnutrition among women and children remains high with approximately 20% of children under 5 years underweight for age.⁹ The *2018 Nigeria Demographic and Health Survey* further indicated a stunting prevalence of 37% nationwide with rates reaching over 40% in northwestern Nigeria.⁸ Previous research studies from this region also show that micronutrient deficiencies are common among pregnant women specifically for iron, folate, vitamin D, and vitamin A.^{10, 11} Anemia during pregnancy is also a well-recognized problem in this geographic area.¹¹

The reasons for poor maternal and child nutrition in northern Nigeria are complex and multi-faceted, and previous research has linked poor nutrition to poverty, food security and reduced access to nutrient-rich foods, low female education, gender dynamics, and sociocultural norms about breastfeeding and nutrition, among other factors.^{11–16} More research is needed to better understand these barriers, and the ongoing exercise of the national food consumption and micronutrients survey could help fill information gaps.¹⁷ In addition, psychosocial influences—across cognitive, emotional, and social domains—may also play an important role in improved nutrition but there has been limited quantitative nutritional ideational research related in northwestern Nigeria or other low- and middle-income countries.

The purpose of this research brief is to summarize nutritional intake and diet diversity of pregnant women and young children in Kebbi, Sokoto, and Zamfara States, and to examine the ideational and sociodemographic factors associated with higher-quality diets. Findings will inform SBC programming on nutrition conducted by Breakthrough ACTION in Nigeria, and broader nutritional programming in northern Nigeria.

Study Methods

Results are based on the Behavioral Sentinel Surveillance (BSS) baseline survey conducted between September and October 2019 in Breakthrough ACTION program areas in

Kebbi, Sokoto, and Zamfara States of northwestern Nigeria. Figure 1 summarizes the survey methods, and Figure 2 (next page) summarizes the definitions of dietary outcomes used in this analysis.

Key Results

Low diet diversity among pregnant women especially for those living in the poorest households

- Less than half (49%) of pregnant women consumed at least 4 or more food groups (out of 8 total) in the study area with more diverse diets (4+ food groups consumed) among pregnant women in wealthiest households (74%) than in the poorest ones (21%), and among pregnant women with any formal schooling (71%) than those with none or informal (Islamic) schooling (44%).
- Nearly all pregnant women consumed grains, white roots, tubers, and plantains in the previous 24 hours (98%) with about three out of five pregnant women also consuming beans or nuts (59%), and green leafy vegetables (58%). Less than one-quarter consumed eggs (21%) or other vitamin-A rich foods (24%), with significant differences across wealth quintiles and by formal school attendance (Figure 3, next page).

FIGURE 1 BSS BASELINE SURVEY METHODS






 Study population	Pregnant women and women with under-2s living within Breakthrough ACTION program areas in Kebbi, Sokoto and Zamfara states (not representative at state level)
 Study design	Cross-sectional
 Sample size	3,032 pregnant women 3,043 women with a child under 2 years
 Sampling method	108 wards across 3 states Census of pregnant women Random selection of women with a child under 2 years
 Data analysis	Mixed-effects logistic regression models were used to derive predicted probabilities of nutrition outcomes, controlling for relevant ideations and sociodemographic characteristics, including household wealth, age, education (woman and spouse), and employment (woman and spouse).

FIGURE 2 DEFINITIONS OF DIETARY OUTCOMES

Minimum diet diversity for women of reproductive age (MDD-W)

In the previous 24 hours, self-reported consumption of at least 5 (out of 10) food groups by women of reproductive age. These 10 food groups include: (1) grains, white roots, tubers, plantains; (2) pulses (beans, peas, lentils); (3) nuts and seeds; (4) dairy; (5) meat, poultry or fish; (6) eggs; (7) dark green leafy vegetables; (8) vitamin-A rich fruits or vegetables; (9) other vegetables; and (10) other fruits.



The BSS baseline survey collected data on 8 food groups in the MDD-W indicator except that nuts and seeds were combined with pulses, and other fruits and vegetables were not separate categories. We therefore cannot report on the MDD-W indicator and instead tabulate higher-diversity diets among pregnant women as those including at least 4 (out of 8) food groups consumed in the past 24 hours.

Minimum diet diversity among children 6–23 months

In the previous 24 hours, mother reports that her child aged 6–23 months consumed at least 5 (out of 8) food groups, including breastmilk. These 8 food groups include: (1) grains, white roots, tubers, plantains; (2) legumes and nuts; (3) dairy; (4) flesh foods; (5) eggs; (6) vitamin-A rich fruits or vegetables including dark green leafy vegetables; (7) other fruits or vegetables; and (8) breastmilk.

Minimum meal frequency among children 6–23 months

In the previous 24 hours, mother reports that her child aged 6–23 months consumed a minimum meal frequency for their age and breastfeeding status defined as at least 2 meals per day for breastfeeding children 6–8 months; at least 3 meals per day for breastfeeding children 9–23 months; at least 4 meals per day for non-breastfed children aged 6–23 months.



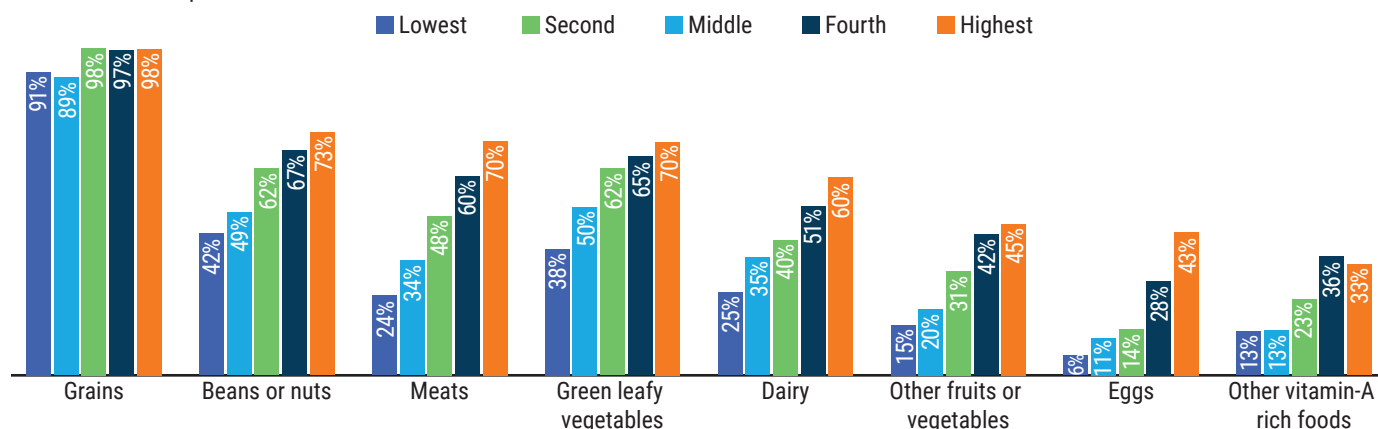
Minimum acceptable diet among children 6–23 months

In the previous 24 hours, mother reports that her child aged 6–23 months consumed both a minimum diet diversity and a minimum meal frequency as per the above definitions.



FIGURE 3 WEALTH GAPS IN THE CONSUMPTION OF DIFFERENT FOOD GROUPS AMONG CURRENTLY PREGNANT WOMEN 15–49 YEARS

Percentage of currently pregnant women 15–49 years living in the study area who consumed certain food groups in the past 24 hours, by household wealth quintile



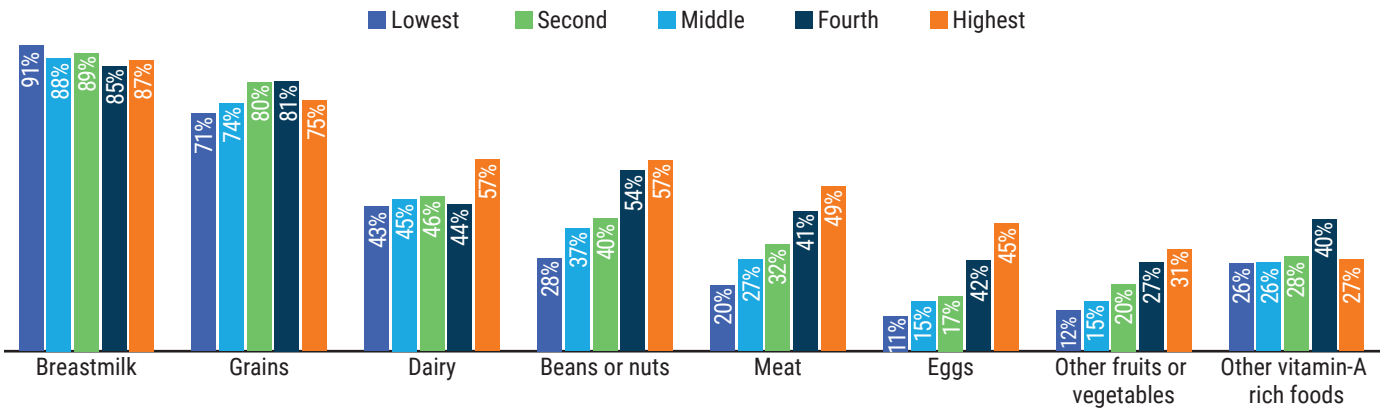
Our baseline survey questionnaire collected data only 8 food groups that were largely harmonized with MDD-W except: (1) nuts and seeds were combined with pulses (beans, peas, lentils); (2) other fruits and vegetables were not separate categories.

Sociodemographic factors and knowledge of complementary feeding timing associated with higher diet diversity in children 6–23 months

- Less than one-third of children aged 6–23 months had a minimum diet diversity (defined as consuming 5+ food groups including breastmilk in the past 24 hours), with no significant difference among breastfed and non-breastfed children.
- Most children aged 6–23 months were given breastmilk (88%) as well as grains, white roots, tubers, or plantains in the previous 24 hours (76%). Yet less than half were given dairy (47%), and beans or nuts (43%). Approximately one-third or fewer were given meat (34%), other vitamin-A rich foods (29%), other fruits or vegetables (21%), or eggs (21%) (Figure 4, next page).

FIGURE 4 WEALTH GAPS IN THE CONSUMPTION OF DIFFERENT FOOD GROUPS BY CHILDREN AGED 6–23 MONTHS

Percentage of children aged 6–23 months living in the study area who consumed certain food groups in the past 24 hours, by household wealth quintile



Note: Minimum diet diversity for children 6–23 months is defined as consuming at least 5 of 8 food groups in the past 24 hours.

- In regression analyses, several sociodemographic factors were significantly associated with consuming a minimum diet diversity among children aged 6–23 months (Figure 5, next page). There was higher likelihood of receiving a minimum diet diversity if the child aged 6–23 months lived in the wealthiest household (1.9 times more likely than the poorest household), had a mother with any formal education (1.2 times more likely than mothers with no formal education), or was aged 12–23 months (1.6 time more likely than children aged 6–11 months). In addition, women who knew that six months was the ideal age to introduce complementary foods were 1.2 times as likely to give their child a minimum diet diversity compared with women without such knowledge.

Programmatic implications

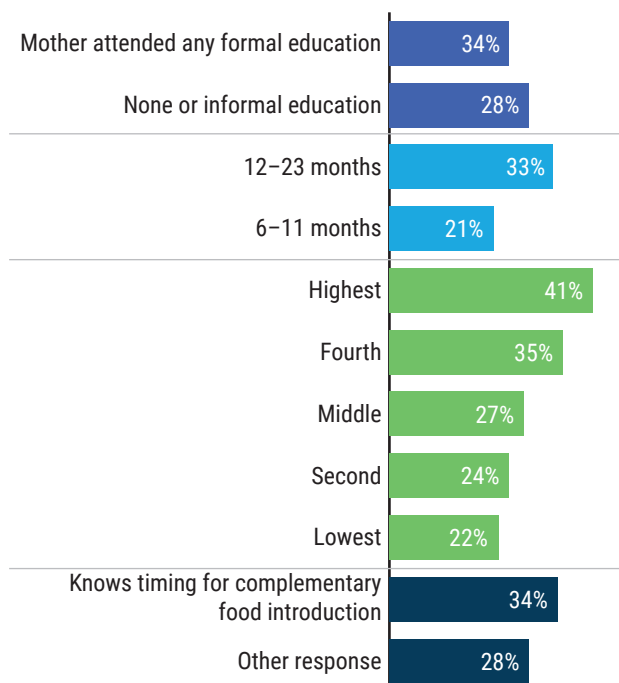
- ✓ Household wealth and mother’s employment were significantly associated with consuming a minimum diet diversity, reinforcing the importance of household wealth and its association with lower quality diets. Nutritional programs may need to target the poorest households to reach those children who are less likely to consume a minimum diet diversity.
- ✓ Women’s knowledge about the timing of the introduction of complementary foods was also associated with their children consuming a minimum diet diversity, indicating a role for SBC programs to provide nutrition education/counseling to women and their spouses in order to raise awareness about breastfeeding and nutritional recommendations in addition to other actions to improve children’s dietary intake, such as providing nutrition education/counseling to women and their spouses.

Half of children 6–23 months received a minimum meal frequency based on their age and breastfeeding status

- Only half (50%) of children 6–23 months received a minimum meal frequency according to their age and breastfeeding status including 48% and 54% for breastfed children 6–8 and 9–23 months, respectively, and only 31% of non-breastfed children aged 6–23 months (Figure 6, next page).
- In regression analyses, several sociodemographic factors were significantly associated with receipt of a minimum meal frequency (Figure 7, next page). There was a higher likelihood of a child receiving a minimum meal frequency if they lived in a wealthier household, had a mother or father who worked outside the home, had an older mother, or were 12–23 months (compared to 6–11 months). Surprisingly, women who believed that the first breastmilk after birth (colostrum) is bad milk were 1.2 times as likely to feed their child 6–23 months a minimum meal frequency compared with those without this belief, and this result merits further qualitative exploration.

FIGURE 5 SOCIODEMOGRAPHIC AND IDEATIONAL FACTORS SIGNIFICANTLY ASSOCIATED WITH CHILDREN 6–23 MONTHS CONSUMING A MINIMUM DIET DIVERSITY

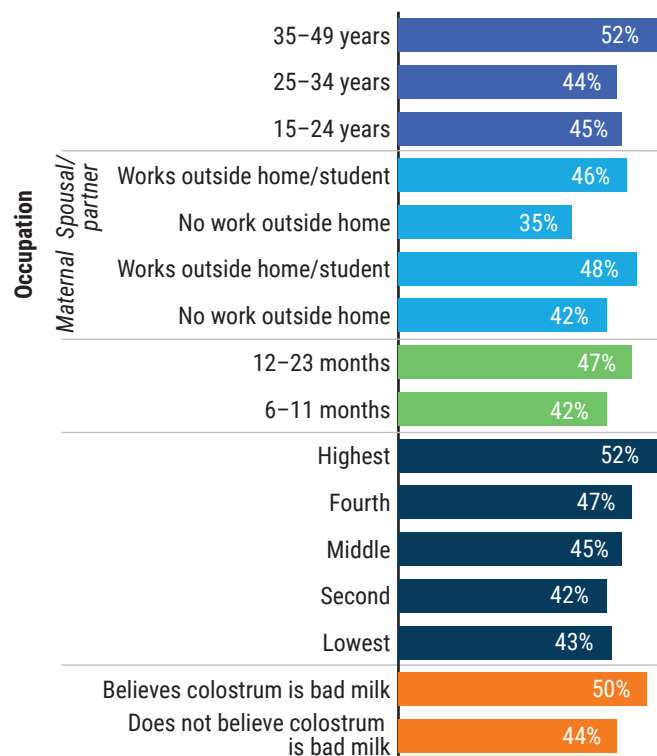
Predicted probabilities of consuming a minimum diet diversity (at least five of eight food groups consumed in the past 24 hours) among children aged 6–23 months living in the study area



Notes: Minimum diet diversity for children 6–23 months is defined as consuming at least 5 of 8 food groups in the past 24 hours. Predicted probabilities of consuming a minimum diversity diet among children aged 6–23 months is derived from mixed-effects logistic regression models adjusted for sociodemographic and nutrition-related ideational factors (Annex 1). All variables presented were significantly associated with the outcome at the <0.05 level.

FIGURE 7 SOCIODEMOGRAPHIC AND IDEATIONAL FACTORS SIGNIFICANTLY ASSOCIATED WITH CHILDREN 6–23 MONTHS CONSUMING A MINIMUM MEAL FREQUENCY

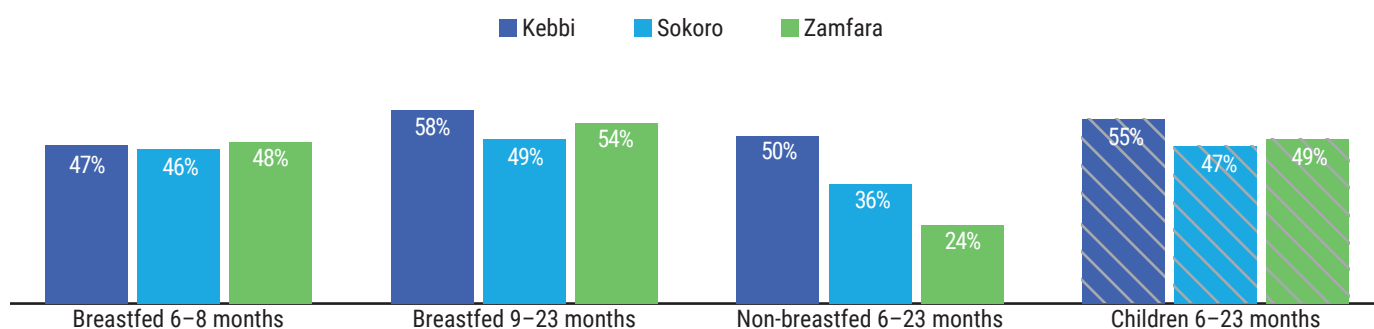
Predicted probabilities of consuming a minimum meal frequency among children aged 6–23 months living in the study area



Notes: Predicted probabilities of consuming a minimum meal frequency among children aged 6–23 months is derived from mixed-effects logistic regression models adjusted for sociodemographic and nutrition-related ideational factors (Annex 1). All variables presented were significantly associated with the outcome at the <0.05 level. Minimum meal frequency is defined as 2+ and 3+ meals per day for breastfed children 6–8 months and 9–23 months, respectively, and 4+ meals per day for non-breastfed children 6–23 months.

FIGURE 6 ABOUT HALF OF CHILDREN AGED 6–23 MONTHS CONSUMED A MINIMUM MEAL FREQUENCY FOR THEIR AGE AND BREASTFEEDING STATUS, BY STATE

Percentage of children aged 6–23 months living in the study area who consumed a minimum meal frequency for their age and breastfeeding status in the past 24 hours, by state



Note: Minimum meal frequency is defined as 2+ and 3+ meals per day for breastfed children 6–8 months and 9–23 months, respectively, and 4+ meals per day for non-breastfed children 6–23 months.

Mother’s nutritional knowledge and household wealth were associated with consuming a minimum acceptable diet among young children

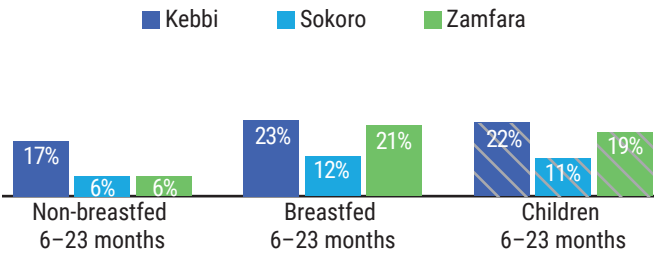
- Only one in five (18%) children 6–23 months had a minimum acceptable diet for their age and breastfeeding status including 8% and 19% of non-breastfed and breastfed children aged 6–23 months, respectively (Figure 8).
- In regression analyses, several sociodemographic factors were significantly associated with a child having a minimum acceptable diet (Figure 9). Women in the wealthiest households or with children 12–23 months were respectively 1.9- and 1.5-times as likely to have a child with a minimum acceptable diet than those in the poorest households or with younger infants.
- Women who knew any sign or symptom of inadequate nutrition in a child, or who knew that six months is the ideal age to introduce complementary foods were 2.2- and 1.3-times more likely to have a child with a minimum acceptable diet compared to those without such knowledge (Figure 9).

Programmatic implications

- Household wealth was significantly associated with consuming a minimum acceptable diet, reinforcing the well-known importance of economic barriers to consuming higher-quality diets. Nutrition programs may need to target the poorest households specifically with support tailored to address this economic barrier, for example, by linking to household empowerment or social safety net programs. The development of local nutritious recipes with locally affordable foods, including trainings on how to prepare such foods, could also help the poorest households in particular overcome economic barriers to improved nutrition. Multisectoral stakeholder collaborations (e.g., agriculture, health, finance, environment) are also required to address inadequate nutrition and to shape nutrition program implementation for the poorest communities.
- Women’s knowledge about the timing of introducing complementary foods and knowledge about the signs or symptoms of inadequate child nutrition were significantly associated with minimum acceptable diet among children 6–23 months, which points to a role for SBC programs to improve knowledge of these two key areas about child nutrition in addition to other actions needed to improve a child’s dietary habits.

FIGURE 8 FEW CHILDREN AGED 6–23 MONTHS CONSUMED A MINIMUM ACCEPTABLE DIET FOR THEIR AGE AND BREASTFEEDING STATUS

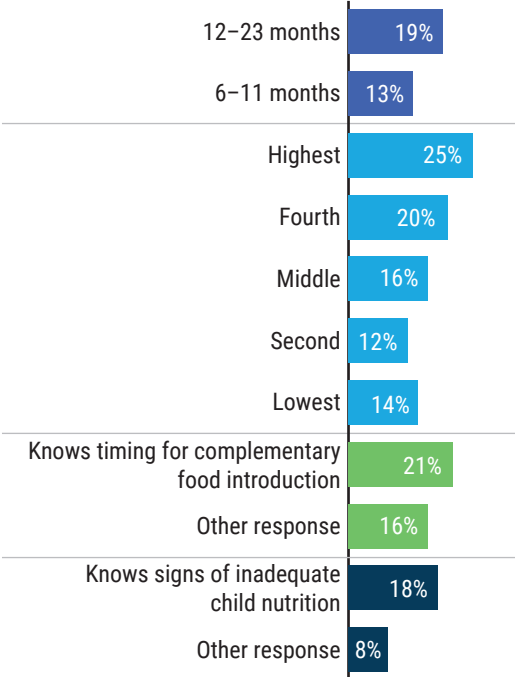
Percentage of children aged 6–23 months living in the study area who consumed a minimum acceptable diet for their age and breastfeeding status in the past 24 hours, by state



Note: Children aged 6–23 months are considered to have a minimum acceptable diet if they meet the criteria for both minimum diet diversity and minimum meal frequency based on their age and breastfeeding status.

FIGURE 9 SOCIODEMOGRAPHIC AND IDEATIONAL FACTORS SIGNIFICANTLY ASSOCIATED WITH CHILDREN 6–23 MONTHS CONSUMING A MINIMUM ACCEPTABLE DIET

Predicted probabilities of consuming a minimum adequate diet among children aged 6–23 months living in the study area



Notes: Children aged 6–23 months are considered to have a minimum acceptable diet if they meet the criteria for both minimum diet diversity and minimum meal frequency based on their age and breastfeeding status. Predicted probabilities of consuming a minimum acceptable diet among children aged 6–23 months is derived from mixed-effects logistic regression models adjusted for sociodemographic and nutrition-related ideational factors (Annex 1). All variables presented were significantly associated with the outcome at the <0.05 level.

Conclusions

The results presented in this brief indicate that dietary diversity and higher-quality diets during the 1,000-day foundational period between pregnancy and a child's second birthday are largely associated with sociodemographic factors including household wealth, maternal and spousal employment, and maternal and child age. Indeed, poverty is a well-recognized barrier to consuming more nutritious and diverse foods, and this economic driver is reinforced by current study results for northwestern Nigeria. Moreover, while the poorest households fared worse in nutritional outcomes than wealthier ones in our analysis, few families in this region—rich or poor—exhibited high-quality and diverse diets needed for this foundational period.

Nutrition programs working in northwestern Nigeria may need to focus on addressing economic barriers to poor nutrition, such as by linking the poorest families to household empowerment or social safety net programs. In addition, the development of local nutritious recipes with locally affordable foods, including trainings on how to prepare such foods, could also help the poorest households in particular overcome economic barriers to improved nutrition. Finally, multisectoral stakeholder collaborations (e.g., agriculture, health, finance, environment) are also required to address inadequate nutrition and to shape nutrition program implementation for the poorest communities.

At the same time, we also found that maternal knowledge of the timing to introduce complementary foods and knowing the signs or symptoms of inadequate child nutrition were significantly related to better dietary outcomes in children aged 6–23 months. This points to an important role for SBC programs to increase knowledge on these two areas about child nutrition among mothers and families while also working to break down other barriers. Also, providing nutrition education/counselling among women and their spouses at the community level is essential in addition to other actions needed to improve nutritional intake during the 1,000-day foundational period.

Importantly, our baseline survey collection focused on ideational factors related to breastfeeding rather than child nutrition, so the lack of significance for many ideational variables in our study may be related to this data collection limitation. In view of this limitation, the midline survey will include additional nutrition ideational questions and data collection harmonized with the latest diet diversity indicator for women of reproductive age (MDD-W). We will therefore conduct more in-depth nutrition analyses based on these new data from the next survey round.

Annex 1: Nutrition-related ideational metrics

DIMENSION	DOMAIN	LIKERT-SCALE STATEMENT OR QUESTION
Cognitive	Knowledge	In your opinion, what is the ideal age to begin introducing complementary foods in addition to breastmilk?
		In your opinion, what are the benefits, if any, for mothers who exclusively breastfeed their infant for the first 6 months of life?
		How can a mother recognize that a child is not getting enough nutrition in his/her diet?
	Beliefs about breastfeeding	Breastmilk contains all the nutrients a baby needs during the first 6 months of his/her life. A mother's breastmilk immediately after birth is bad milk. It is important for mothers to only give their child breastmilk during the first 6 months after birth.
Emotional	Self-efficacy	How confident are you that you could exclusively breastfeed your child for the first 6 months of life?
		How confident are you that you could start a conversation with your husband/partner about breastfeeding your child?
Social	Social influence	Besides yourself, who else may influence your decision about whether to breastfeed or not?
Intentions	Intentions	How likely are you to exclusively breastfeed your newborn for the first 6 months of life, that is, only give your infant breastmilk, not even water, for the first 6 months of life?

References

1. Federal Government of Nigeria. 2019. National Strategic Health Development Plan II (NSHD) 2018–2022. Abuja: Federal Government of Nigeria.
2. United Nations General Assembly. 2015. Transforming our work: the 2030 agenda for sustainable development. New York: United Nations.
3. U. S. Agency for International Development [USAID]. 2015. "The 1000-day window of opportunity: multisectoral nutrition strategy 2014–2025." Washington DC: USAID.
4. Gernand, A. D. et al. 2016. "Micronutrient deficiencies in pregnancy worldwide: health effects and prevention," *Nature Reviews Endocrinology* 12(5): 274–289. doi: 10.1038/nrendo.2016.37
5. Black, R. E. et al. 2013. "Maternal and child undernutrition and overweight in low-income and middle-income countries," *The Lancet* 382(9890): 427–451. doi: 10.1016/S0140-6736(13)60937-X
6. Fleming, T. P. et al. 2018. "Origins of lifetime health around the time of conception: causes and consequences," *The Lancet* 391(10132): 1842–1852. doi: 10.1016/S0140-6736(18)30312-X
7. Rahman, M. M. et al. 2016. "Maternal anemia and risk of adverse birth and health outcomes in low- and middle-income countries: systematic review and meta-analysis," *American Journal of Clinical Nutrition* 103(2): 495–504. doi: 10.3945/ajcn.115.107896
8. National Population Commission (NPC) [Nigeria] and ICF. 2019. Nigeria Demographic and Health Survey 2018. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF.
9. National Bureau of Statistics. 2018. National Nutrition and Health Survey (NNHS): Report on the nutrition and health situation of Nigeria. Abuja: Nigerian National Bureau of Statistics.
10. Harika, R. et al. 2017. "Micronutrient status and dietary intake of iron, vitamin A, iodine, folate and zinc in women of reproductive age and pregnant women in Ethiopia, Kenya, Nigeria and South Africa: A systematic review of data from 2005 to 2015," *Nutrients* 9(10): 1096. doi: 10.3390/nu9101096.
11. Lindsay, K. L., E. R. Gibney, and F. M. McAuliffe. 2012. "Maternal nutrition among women from sub-Saharan Africa, with a focus on Nigeria, and potential implications for pregnancy outcomes among immigrant populations in developed countries," *Journal of Human Nutrition and Dietetics* 25(6): 534–46. doi: 10.1111/j.1365-277X.2012.01253.x.
12. Ebomoyi, E. 1988. "Nutritional beliefs among rural Nigerian mothers," *Ecology of Food and Nutrition* 22(1): 43–52. doi: 10.1080/03670244.1988.9991053.
13. Fadare, O. et al. 2019. "Mother's nutrition-related knowledge and child nutrition outcomes: Empirical evidence from Nigeria," *PLoS ONE* 14(4): e0212775.
14. Girard, A. W. et al. 2012. "Public health interventions, barriers, and opportunities for improving maternal nutrition in Northeast Nigeria," *Food and Nutrition Bulletin* 33(2 Suppl): S51–70.
15. Ojofeitimi, E. O., I. Elegbe, and J. Babafemi. 1982. "Diet restriction by pregnant women in Nigeria," *International Journal of Gynecology & Obstetrics* 20(2): 99–103. doi: 10.1016/0020-7292(82)90019-4.
16. Ojofeitimi, E. O. and C. M. Tanimowo. 1980. "Nutritional beliefs among pregnant Nigerian women," *International Journal of Gynecology & Obstetrics* 18(1): 66–69. doi: 10.1002/j.1879-3479.1980.tb00245.x.
17. IITA. 2021. "National food consumption and micronutrients survey." Abuja, Nigeria: IITA.

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