

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

Routine childhood immunization

This brief provides rigorous evidence-based insights to implementers and researchers of social and behavior change (SBC) programs that seek to improve community knowledge, attitudes, norms and behaviors for improved health of women and their young children. The brief focuses on key outcomes in routine childhood immunization, including receipt of all basic vaccinations needed for a child to be considered fully immunized by their first birthday according to the Nigerian Ministry of Health (BCG, three doses of oral polio vaccine, three doses of DPT vaccine and one dose of measles vaccine), while also uncovering the barriers and facilitators to vaccine uptake. It is one of a series that present findings from a Breakthrough RESEARCH study that uniquely captures data on a wide range of psychosocial drivers of behavioral outcomes in the areas of family planning, malaria, and maternal, newborn and child health, and nutrition (MNCH+N). The results presented in this series will inform the improvement of women and children's health in Nigeria and help to achieve the objectives of the Nigerian Reproductive Health Policy,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 ACTION are USAID's flagship SBC programs. Breakthrough ACTION in Nigeria implements SBC programming in eleven states and the Federal Capital

KEY POINTS

Very few children (6%) aged 12–23 months in northwestern Nigeria were fully immunized by their first birthday.

Spousal opposition, health system problems, and vaccine concerns were the main barriers to vaccinating children.

Spouses play a dominant role in vaccination decisions, and SBC programs should involve spouses to increase vaccine uptake. More research is needed to better understand reasons for spousal opposition.

Women who said health providers influenced their vaccination decisions were significantly more likely to get their child vaccinated than those who did not. SBC programs could focus on provider behaviors around vaccine promotion, such as during health talks at ANC visits.

SBC programs should reinforce messages about vaccine safety and efficacy, and help build community trust in providers delivering immunization services.

Antenatal care visits may be an important moment to improve community views of health services quality, address women's vaccine hesitancy, and expand the reach of health worker influence for vaccinations.

Programs may need to take a whole system approach, including SBC programs targeted at multiple societal levels alongside health system strengthening efforts.

Territory (FCT) by targeting key psychosocial factors at multiple socio-ecological levels (e.g. individual, community, society) in order to improve health behaviors in the areas of malaria, family planning and maternal, newborn and child health plus nutrition (MNCH+N). Breakthrough RESEARCH in Nigeria conducts rigorous research to inform SBC program implementation in three of these program states (Kebbi, Sokoto and Zamfara). Findings presented here are from a Breakthrough RESEARCH baseline study that will be used to inform SBC program adaption and scale-up in Nigeria.

Setting the context

Routine childhood immunization is one of the most cost-effective public health interventions and has been estimated to avert approximately 2 to 3 million deaths per year.³ Yet, vaccination rates in northwestern Nigeria remain extremely low. According to the Nigerian Ministry of Health, a child is considered fully immunized if he/she receives a BCG vaccine against tuberculosis, three doses of DPT to prevent diphtheria, pertussis, and tetanus, at least three doses of polio vaccine and one dose of measles vaccine (Table 1). In 2018, only 20 percent of children 12–23 months in northwestern Nigeria were considered fully immunized by one year of age, or who received all basic vaccinations before their first birthday based on data collection among children aged 12–23 months.⁴

Several studies indicate that low vaccination rates in this region may be related to facility distance, concerns about vaccine safety and perceived side effects, antenatal care attendance, lack of social support for immunization, irregular vaccine supply at health facilities as well as wealth, education, and employment.^{5–7} Other studies suggest that polio immunization campaigns, which may occur several times per year, distract from routine immunization service delivery and may have led to persistent vaccine myths within this region.⁸

Family decision-making processes are multifaceted and influenced by the complex interaction of knowledge, beliefs, social norms, and other psychosocial factors that are posited by theories as intermediate determinants of behavior change.^{9,10} We adapted the World Health Organization’s vaccine hesitancy metrics to the northwestern Nigerian context in order to develop a set of ideational metrics for this

TABLE 1 NIGERIA’S ROUTINE CHILD IMMUNIZATION SCHEDULE






AGE OF CHILD	VACCINATION	DISEASE PROTECTION
At birth	Hepatitis B vaccine (HBV 1)	Hepatitis B
	Oral polio vaccine (OPV 0)	Polio
	BCG vaccine	Tuberculosis
6 weeks	OPV 1	Polio
	Pentavalent 1	DPT, Hib and hepatitis B
	Rotavirus vaccine 1	Rotavirus
	PCV 1	Pneumonia and otitis media
10 weeks	OPV 2	Polio
	Pentavalent 2	DPT, Hib and hepatitis B
	Rotavirus vaccine 2	Rotavirus
	PCV 2	Pneumonia and otitis media
14 weeks	OPV 3	Polio
	Pentavalent 3	DPT, Hib and hepatitis B
	PCV 3	Pneumonia and otitis media
6 months	Vitamin A	Vitamin A deficiency
9 months	Measles vaccine	Measles
	Yellow fever vaccine	Yellow fever
12–24 months	Meningitis vaccine	Meningitis and septicemia
	Vitamin A	Vitamin A deficiency
	OPV booster	Polio
15–18 months	MMR	Measles, mumps, rubella
	Chicken pox vaccine	Chicken pox
24 months	Typhoid vaccine	Typhoid
Girls aged 13+ years	Human papilloma virus (HPV) vaccine	Cervical cancer caused by HPV types 16 and 18

study.^{11,12} This research brief aims to describe different barriers to routine immunization uptake, quantify the importance of ideational factors on vaccine behaviors, and measure the extent to which SBC programs may effectively change vaccination practices by targeting identified psychosocial influences.

Study methods

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

FIGURE 1 BSS BASELINE SURVEY STUDY METHODS

 <p>Study population</p>	Pregnant women and women with under-2s living within Breakthrough ACTION program areas in Kebbi, Sokoto and Zamfara states (not representative at state level)
 <p>Study design</p>	Cross-sectional and cohort components
 <p>Sample size</p>	3,032 pregnant women 3,043 women with a child under 2 years
 <p>Sampling method</p>	108 wards across 3 states Census of pregnant women Random selection of women with a child under 2 years
 <p>Data analysis</p>	Mixed-effects logistic regression models were used to derive predicted probabilities for ANC4+ (four or more visits) and facility-based delivery, controlling for pregnancy-related ideations and sociodemographic characteristics, including household wealth, age, education (woman and spouse), and employment (woman and spouse).

Key results

Very low routine childhood immunization rates

- Very few children aged 12–23 months were fully immunized by their first birthday (6%). Slightly higher percentages of children 12–23 months received: BCG (27%), three doses of oral polio (27%), one dose of measles (18%), and three doses of DPT (10%).
- Vaccination coverage inequities exist with <4% of children 12–23 months receiving all basic vaccinations in the lowest, second, and middle wealth quintiles compared to 9% and 16% in the fourth and highest quintiles.

Low vaccine knowledge, common myths, spousal opposition and health services problems

- Only 25% of respondents knew that a child should get their first routine immunization at birth. Nearly half (46%) said they did not know the timing of the first vaccination.
- More than one-quarter (28%) of respondents believed vaccines were either not effective or were unsure about their effectiveness. More than half (54%) believed or were unsure if vaccines contain chemicals that are dangerous to a child’s health. Nearly one-quarter cited vaccine

MAP 1 VERY LOW RATES OF FULLY VACCINATED CHILDREN 12–23 MONTHS ACROSS LOCAL GOVERNMENT AREAS

Percentage of last-born children aged 12–23 months who received all basic vaccinations by local government area.

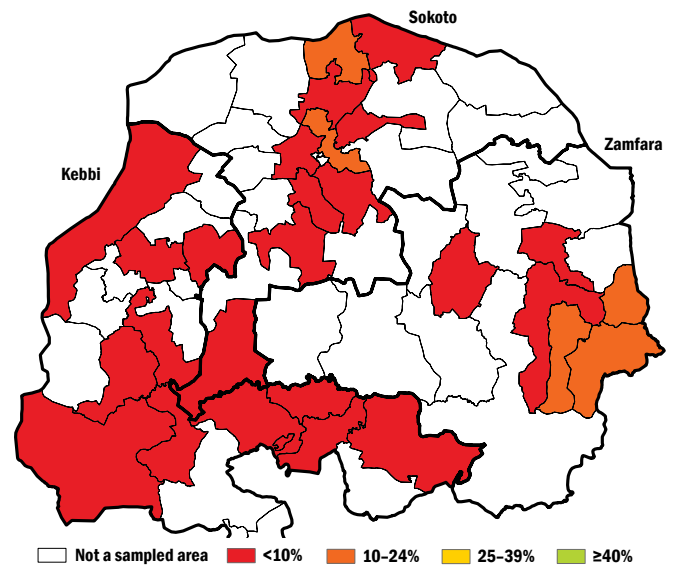
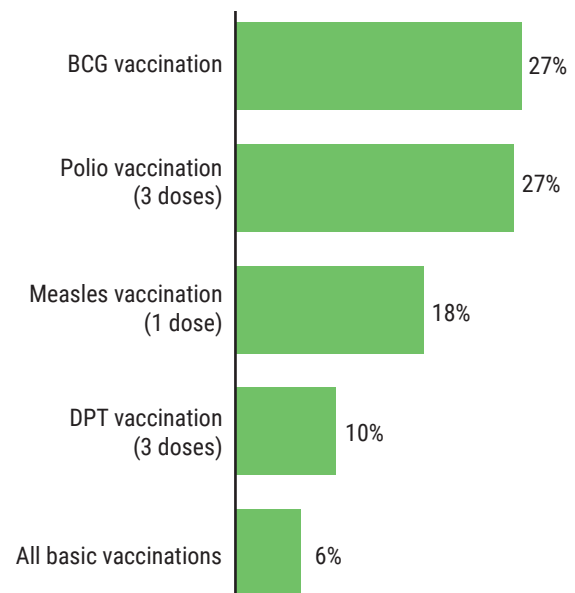


FIGURE 2 LOW RATES OF ROUTINE CHILDHOOD IMMUNIZATIONS BY VACCINE TYPE

Percentage of last-born children aged 12–23 months who received all basic vaccinations by the survey interview date (BCG vaccine, 3 doses of oral polio vaccine, 1 dose of measles vaccine, and 3 doses of DPT vaccine), by vaccine type



concerns as reasons for not getting their child vaccinated including fear of needles (11%), fear of side effects or safety issues (10%), or lack of effectiveness (2%).

- Among women who did not vaccinate their youngest child, one-third (33%) cited spousal opposition as a reason for not doing so. Over one-third cited an issue related to health services quality including facility distance (14%), closure (9%), cost (6%), no female provider (4%), disrespectful provider (1%), or poor-quality service (4%) (Table 2).

Programmatic implications

- ✓ **Reasons for not vaccinating children are complex and multi-faceted including spousal opposition, health services quality and vaccine concerns, which underscores the need for a whole system approach to raise vaccination rates from their currently very low levels. This includes SBC programs working at multiple societal levels and through different actors and communication channels, alongside strengthened health systems for immunization services.**

TABLE 2 SPOUSAL OPPOSITION, HEALTH FACILITY PROBLEMS, AND VACCINE CONCERNS ARE MAIN BARRIERS TO VACCINATION

Among women who did not vaccinate her youngest child (n=1,847), percentage who cited certain reasons for not vaccinating

REASON	%
Spousal opposition	34
Facility distance	14
Fear needles	12
Vaccines no safe/fear side effects	10
Facility closed	9
Too expensive	6
No female provider	4
Poor quality service	4
Don't know where to go	3
Vaccines not effective	2
Disrespectful provider	1
Religious/community leader opposition	1

Spousal and health worker support is critical

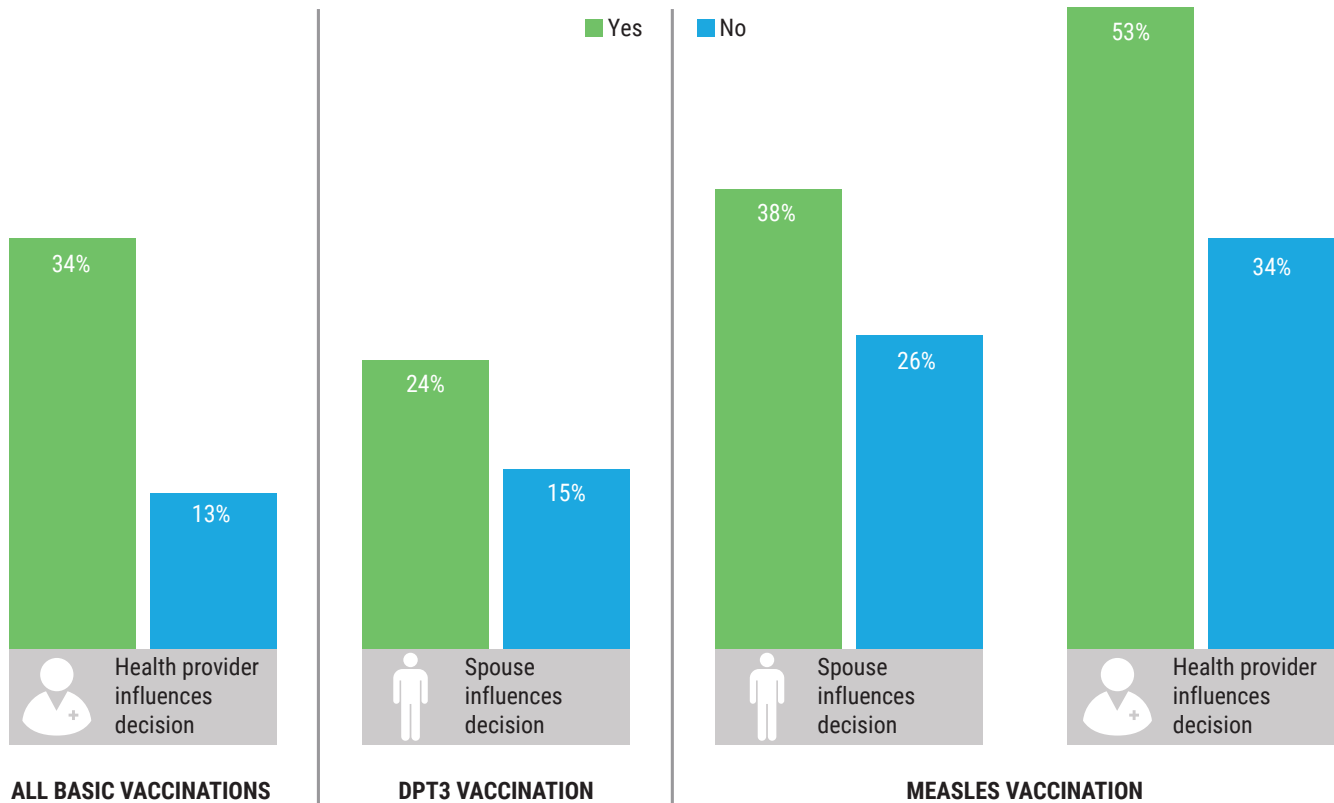
- Almost three-quarters of respondents reported that their spouse influences their decision to vaccinate a child, while few women mentioned mothers-in-law (8%), mothers (6%), and health providers (5%).
- Spousal and health provider support is critical for promoting vaccination uptake. In regression analyses, women whose spouses supported their vaccination decision were 1.6 and 1.4 times as likely to have their child receive three doses of DPT and measles vaccine than those without spousal support, respectively. Women who said health providers influenced the decision were 2.6 and 1.6 times as likely to have their child receive all basic vaccinations and measles vaccine, respectively. More research is needed to better understand how health providers have influenced decisions and ways to support such practices in order to improve vaccine uptake (Figure 3).

Programmatic implications

- ✓ **SBC programs could maximize effectiveness by specifically engaging spouses and health providers in vaccination promotion activities. Spouses play an outsized role in influencing vaccine decisions and their support is critical for uptake. More research is needed on male vaccination knowledge, beliefs, and attitudes in order to inform SBC messaging for this key group.**
- ✓ **While few women cite health providers as influencing vaccine decisions, women who said health providers influenced their vaccination decisions were significantly more likely to get their child vaccinated than those who did not. Antenatal care visits may be an important point of contact to expand their reach, but more research is needed on how best to engage health workers in vaccine promotion during antenatal care visits or other contact points.**

FIGURE 3 SPOUSES AND HEALTH PROVIDERS INFLUENCE VACCINE UPTAKE

Predicted probabilities* of having a fully vaccinated child aged 12–23 months, or receipt of DPT3 or measles vaccination among this age group by social influence



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

Beliefs about vaccine efficacy and antenatal care attendance also matters

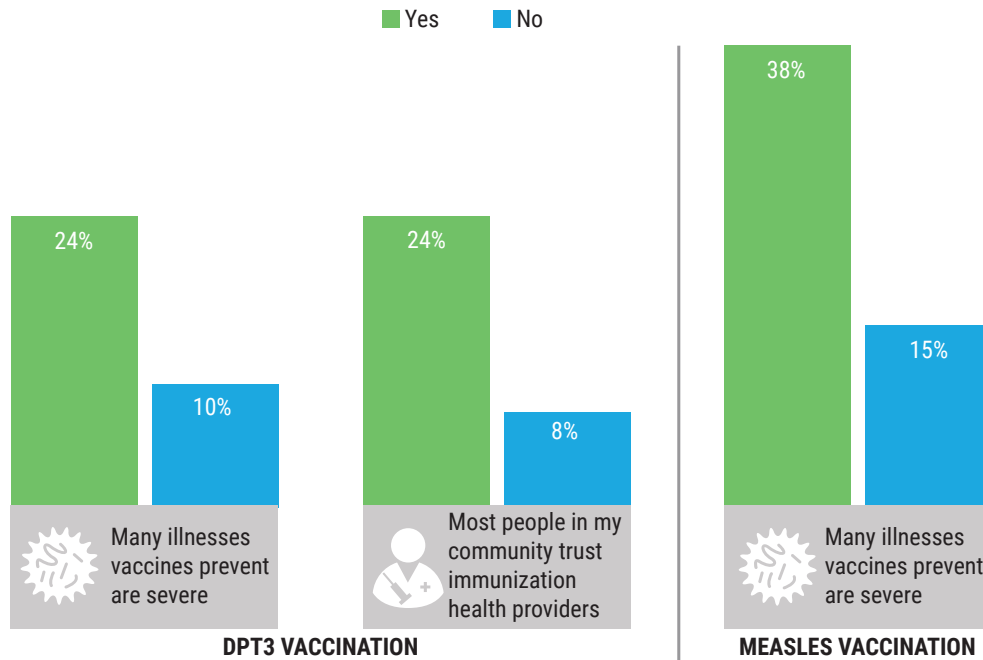
- Women who believed that the illnesses vaccines prevent are severe were 2.6 times as likely to have a child vaccinated against measles or with three doses of DPT vaccine.
- Women who believed that most women in her community trust immunization health providers were 3.1 times as likely to have her child receive three doses of DPT vaccine.
- Women who attended antenatal care at least 4 times (ANC4+) were more than twice as likely to have a fully vaccinated child than non-users (Figure 4, next page).

Programmatic implications

- ✓ SBC programs should consider reinforcing messages about vaccine safety and efficacy against severe vaccine-preventable diseases.
- ✓ Women’s trust of immunization service providers is an important factor in vaccine uptake and underscores the need to improve perceived and actual health services quality.
- ✓ Antenatal care visits may be an important moment to improve community views of health services quality, address women’s vaccine hesitancy, and expand the influence of health providers on vaccination decisions.

FIGURE 4 VACCINE-RELATED IDEATIONS ASSOCIATED WITH VACCINE UPTAKE

Predicted probabilities* of having a fully vaccinated child aged 12–23 months, or receipt of DPT3 or measles vaccination among this age group by ideational factor



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

Conclusions

The results indicate an important role for SBC programming to achieve substantial improvements in routine childhood immunization practices in northwestern Nigeria, even in the absence of other changes. The most important ideations for SBC programs to target include fostering social support mechanisms and addressing beliefs about vaccine efficacy.

Reasons for not vaccinating children are complex and multi-faceted, including spousal opposition, health system issues, and vaccine concerns were the main barriers to vaccinating children, which underscores the need for a whole system approach to raise vaccination rates from their currently very low levels. SBC programs will need to work at multiple societal levels and through different actors and

communication channels, alongside efforts to strengthen health systems for immunization services.

Social influences, especially spouses and health care providers, are critical for vaccine promotion. Since spouses have a clear influence on vaccine decisions, SBC programs include approaches that specifically address spouses/husbands as an audience. In contrast, few women cited health care providers as influencing their vaccine decisions, but when they did, health care provider support increased the likelihood of vaccination. Programs should think about how to extend the reach of this influential group, such as through antenatal care visits, which are important opportunities to improve vaccine knowledge, address vaccine hesitancy and build community trust in immunization providers.

Annex 1: Vaccine-related ideational metrics

DIMENSION	DOMAIN	LIKERT-SCALE STATEMENT OR QUESTION
Cognitive	Knowledge	At what age should a child go for his/her first routine vaccination?
	Beliefs about vaccine safety and efficacy	In your opinion, how effective are childhood vaccines?
		Many of the illnesses that vaccines are severe Vaccines have chemicals that can be dangerous to a child's health
	Beliefs about health services	Immunization services in my community are free Most people in my community trust health workers who provide immunization services Health facilities in my community frequently have the vaccine you need and when you need it
Emotional	Self-efficacy	I know where and when to get my child vaccinated
Social	Social influence	Besides yourself, who else may influence your decision to get a child vaccinated?
	Norms	Most parents in my community take their children to the facility for routine immunization
Intentions	Intentions	If you had another infant today, how likely is it that you would make sure he/she received all of his/her recommended vaccines?

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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.