GENDER BARRIERS TO POLIO IMMUNIZATION IN NIGERIA: LITERATURE REVIEW

UNIVERSITY OF WASHINGTON STRATEGIC ANALYSIS, RESEARCH & TRAINING (START) CENTER

REPORT TO THE BILL & MELINDA GATES FOUNDATION

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Photo: National Geographic

Executive Summary

The Polio Eradication team at the Bill and Melinda Gates Foundation (BMGF) aims to contribute to global polio eradication by achieving high immunization coverage through routine and campaign vaccinations. The BMGF has identified Nigeria as a priority country, where lack of progress in combating polio in some northern regions of the country have significantly affected eradication efforts. Addressing the geographic and gender-related factors affecting vaccination uptake and healthcare-seeking behavior for polio-like symptoms can help identify key levers to improve Polio outcomes. This project aims to enhance understanding of the gender-specific barriers and facilitators to immunization and healthcare access, ultimately supporting the Foundation's efforts to eradicate polio in Northern Nigeria.

The Foundation's Polio team engaged the University of Washington's Strategic Analysis, Research & Training (START) Center to conduct a literature review identifying gender-related factors influencing Nigerian female caretakers' decisions to vaccinate and/ or to seek care for their young children. The review identified gender factors to inform the creation of a survey instrument designed by Investigators from the Aminu Kano Teaching Hospital in Kano, Nigeria in partnership BMGF and the Imperial College of London. The review screened over 1700 articles, resulting in 61 relevant articles included in this analysis. START analysts then conducted a rapid thematic analysis to identify key themes and considerations.

The analysis identified the following key Gender Factors Influencing Vaccine Demand and Healthcare Seeking Behaviors:

Caretaker Factors:	**Intra-household Factors:**	**Community/ Context Factors:**
-Schedules/Daily Patterns	-Spousal Influence	-Gender of Health Workers
-Birth Experiences	-Influence of Elder Males	-Gender of Campaign Workers
-Lack of Education, Literacy	-Influence of Elder Females	-Vaccine Misinformation
	-Sex of Child	-Autonomy in Decision-Making and Movement

Additionally, gender findings were contextualized by:

1) A female caretakers' environment, social sphere, and personal experience which dictate her healthcare journey map from birth to immunization of their children.

2) Insights into Northern Nigeria's nomadic communities, where influential males, particularly religious leaders, hold sway over vaccination perceptions.

3) Shifting beliefs and behaviors around polio which dictate understanding of and response to polio-like symptoms. Factors include myths, unorthodox traditional care, barriers to orthodox care, and the influence of family members.

Multiple highly relevant studies from the state of Zamfara are featured throughout the report to highlight similar research on which this new study will build. There is opportunity to learn more about other states such as Sokoto, Kebbi, and Katsina. The report also highlights Hausa-specific research, and there is opportunity to better understand additional ethnic experiences such as the Fulani. While immunization and health behaviors in Northern Nigeria have been studied, there is significant opportunity to better understand how gender impacts access, uptake, and behaviors as we move toward the global eradication of Polio.

Intro

The Global Polio Eradication Initiative (GPEI), in collaboration with partners and allies such as the Bill and Melinda Gates Foundation, have successfully decreased incidence of polio by 99% by intensifying immunization efforts and improving surveillance to detect and respond to outbreaks swiftly (1).

Although Nigeria was WPV certified in 2020, Nigeria faces significant challenges in combating cases of circulating vaccine-derived polioviruses (2,3). Lack of, or incompletion of, childhood immunization contributes to Nigeria having one of the highest under-five mortality rates in the world (4). As this report discusses, vaccine acceptance is informed by many variables and, in Northern Nigeria, is exacerbated by socio-political instability and healthcare access issues, leading to insufficient vaccination coverage.

Despite efforts, achieving eradication remains a complex task requiring sustained international and local support. This report focuses on how gender and the empowerment of the female caretaker and her decision-making might improve polio outcomes in Northern Nigeria.

KEY TAKEAWAYS: GENDER FACTORS AFFECTING VACCINE DEMAND AND UPTAKE

Gender findings fell into three categories: those related to the caretaker, those related to intra-household dynamics, and those related to the community and context surrounding the caretaker and their family.

Gender-Related Factors: Caretaker

Women predominantly serve as primary caretakers within families, influencing healthcare decision making and vaccine uptake. This role significantly impacts their ability to access and utilize vaccination services. Identified barriers include:

1) **Caretakers' Schedules / Daily Patterns -** Caretaking duties and work result in significant time and travel constraints, introducing challenges in attaining vaccination.

2) **Birth Experiences -** Experiences during childbirth have significant influence on women's trust and decisions regarding healthcare for themselves and their children.
3) **Lack of Education and Literacy-** Lower educational and literacy levels among women impacts understanding of vaccine benefits and schedules, reducing vaccine uptake.

Gender-Related Factors: Intra-Household

Intra-household gender dynamics are shaped by complex societal power structures and unique family relationships. In turn, intra- household dynamics can play a critical role in influencing vaccine decisions, often introducing barriers to vaccine acceptance and access.

1) **Spousal Influence -** Husbands have a demonstrable influence on the healthcare decisions of their wives, impacting vaccine uptake of families based on their vaccine and healthcare beliefs and perceptions.

2) **Influence of Elder Males -** Elder males in positions of authority within communities, religious groups, and families have influence on opinions and decisions related to vaccination.

3) **Influence of Elder Females -** Elder females within the family, such as grandmothers, mothers-in-law and aunts, influence health decisions, including vaccinations, through advice and traditional practices.

4) **Sex of Child -** Cultural values and biases towards male vs. female children and decisions about their health can affect caregiver vaccination decisions.

Gender-Related Factors: Communities and Contexts

The relationships between gender and community contexts and healthcare environments have impacts on vaccine demand and uptake, particularly when looking at the gender of who is delivering care, as well as vaccine misinformation within the community.

1) **Gender of Health Workers -** The gender of health professionals has influence on vaccine acceptance due to individual preference or trust of practitioners of a specific gender.

2) **Gender of Campaign Workers -** The gender of individuals leading vaccination campaigns can affect how these initiatives are received and trusted within different communities.

3) **Vaccine Misinformation -** Misinformation related to the effects of vaccines on pregnancy and fertility disproportionately affects women, resulting in hesitancy and reduced vaccine uptake due to fears and misconceptions.

4) **Autonomy in Decision Making and Movement -** Cultural and social norms can limit women's autonomy in health-related decision-making and their freedom to travel.

These gender factors exist in a larger, complex environment and are inextricably interconnected with additional factors which are highlighted through the rest of the report.

METHODS

The project involved a comprehensive literature review and data extraction process. The START team searched PubMed and Global Index Medicus for articles pertaining to gender, women, mothers, and immunization and vaccines in Nigeria and in countries bordering Nigeria. The team also ran a search for articles on healthcare seeking behavior which included reference to polio, children, Nigeria and bordering countries as well as acute flaccid paralysis, and other polio symptoms. Search terms can be found in the appendix. Initially, 811 articles were screened, 314 were assessed for eligibility, and 61 were included for data extraction. A data extraction form was created in partnership with the client, incorporating a-priori themes expected in the relevant literature. The extraction focused on acceptance factors such as maternal, social, financial, and time-based influences, along with noting the methods used in each study. Data were then analyzed using frameworks for analysis and rapid thematic analysis in Miro. To guide data analysis, established frameworks (20, 21) for understanding vaccine demand were modified to guide a thematic analysis in Miro. Eventually the team created novel frameworks shown in Figure 1, 2, and 3.

ANALYSIS: FACTORS AFFECTING CAREGIVERS' DECISION-MAKING & HEALTHCARE JOURNEY

A complex network informs caretakers' decision making of factors in and out of their control. The contextual environment in which the caretakers live, the social network in which they operate, and their personal experiences, knowledge, and fears all inform their healthcare journey from birth to the moment they decide whether or not to vaccinate or seek care for their child.

Caretakers' Decision-Making: Contextual Factors

Literature identified these factors underline vaccine decision-making. Factors in red, such as a community's experience of conflict or nomadic living-style are noted to be associated with lower childhood vaccination rates. Factors in green, such as households with access to media and to internet and caretakers who are employed, were associated with children more likely to be vaccinated. Those factors in black were more context-dependent and their influence was not consistently associated with a single outcome.

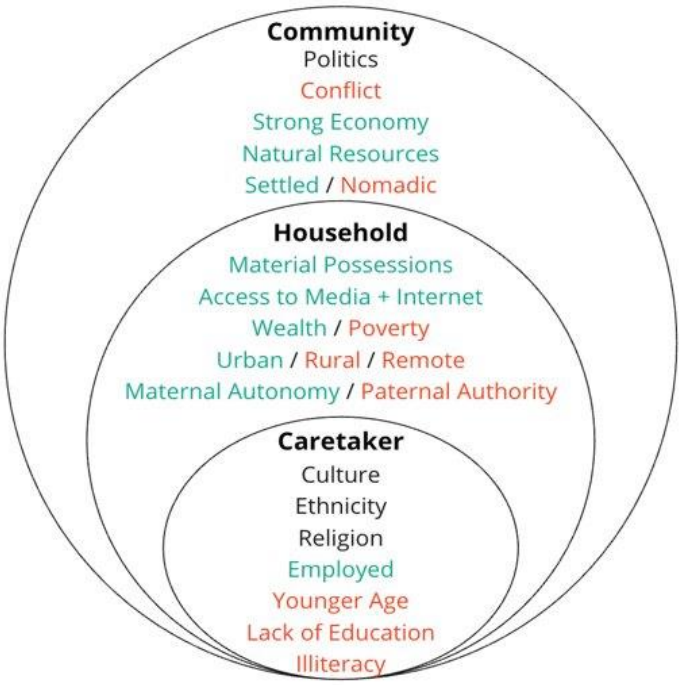

Figure 1 – Caretakers' Decision-Making: Contextual Factors

Caretakers' Decision-Making: Social Factors

Caretakers are highly influenced by people around them, from their own family members to influential community leaders. The beliefs of people surrounding them can influence their own beliefs, and/or their behaviors.

Neighbors - Neighbors can fuel **rumors and gossip**, but when female neighbors are engaged in community decision making and health initiatives it can positively influence caretakers to engage.

Government - Islamic communities have felt marginalized by government and threatened by western ideals, so caregivers have at times been told to **mistrust** government-backed health initiatives.

Male Community Leaders - Community elders and religious figures are the leader's **opinions** rule the community. Muslim leaders at times have cast vaccines, and other stakeholders, as threats to Islamic values.

Door-to-Door Campaign Workers - Workers sometimes cause fatigue by visiting often. They can also cause **confusion**: are routine immunizations not as important if they're not door to door? Why is this treatment free when other care is not?

Male Partner - Caretakers often must defer to husbands who dictate their actions, use of time and resources. Some fears of side effect and have religious beliefs that God should cure illness.

Family - Senior family members including parents, in-laws, and aunts can carry misinformation and negative attitudes. Male elders are particularly influential.

Caretakers Decision-Making: Maternal/Caretaker Factors

Influenced by contextual and social factors, mother/caretakers' decision-making is ultimately determined by their thinking. As shown in Figure 2, higher maternal knowledge, awareness, and trust are noted to be associated with higher levels of immunization whereas belief in vaccine and polio myths as well as fear are associated with a lower likelihood of immunizing children. Perception and memory are more context dependent. For instance, some perceive polio to be less dangerous than

measles, and some have memories of past medical traumas such as the unethical Trovan Trial in 1996, which has left generational mistrust of medical institutions (5,6).

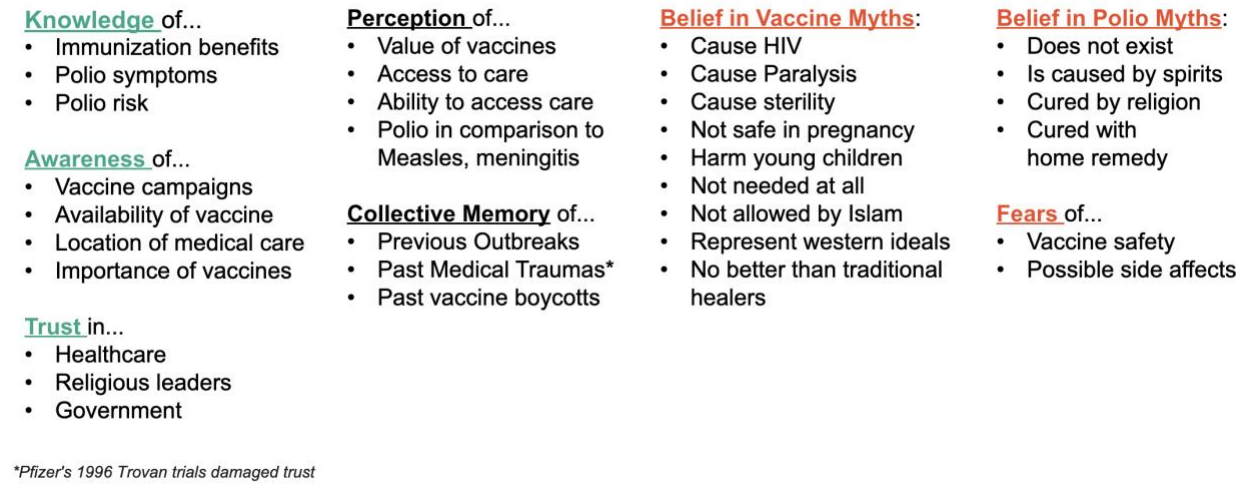

Figure 2 - Caretakers' Decision-Making: Maternal Factors

These many factors affecting caretakers dictate their choices and behaviors as they navigate their healthcare journey. The journey begins with a mother's pregnancy and use of reproductive and maternal health services. It is influenced by her ability to access reliable and high-quality care and is influenced by her interactions with health workers and the broader health system. At the moment of immunization, the ownership of a vaccine card and the offer of incentives are associated with higher likelihood to immunize. Figure 3 outlines factors at each step in her journey which influence her decision to immunize her child(ren).

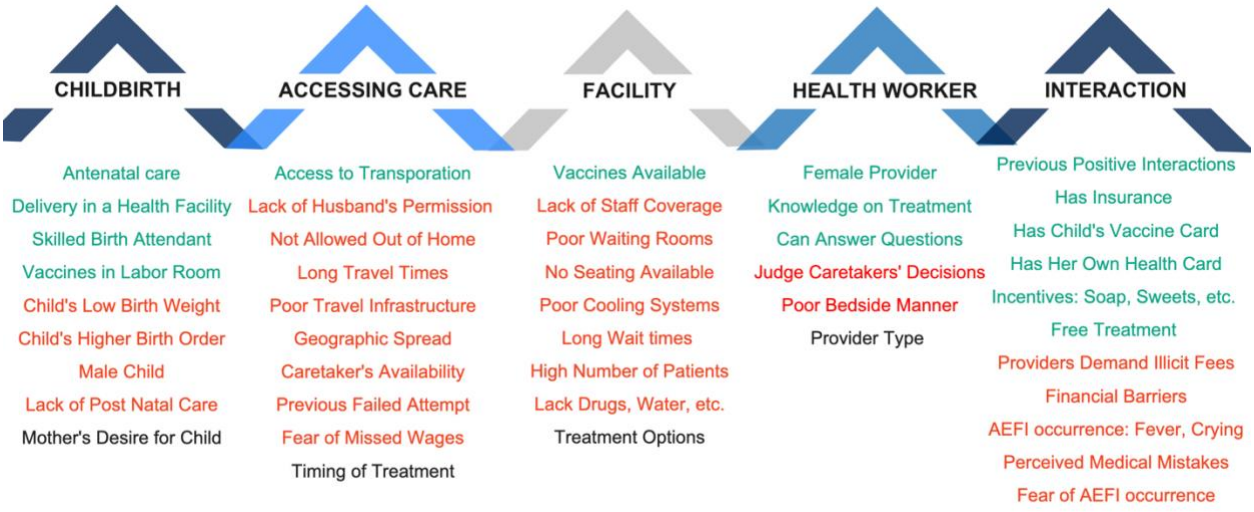

Figure 3 - Caretakers' Healthcare Journey: Factors Affecting Likelihood to Vaccinate Children

This broad-stroke journey is a summary of literature from Nigeria and other contexts about polio and other vaccinations, presenting a generalized view of how caretakers make decisions. The following section specifically speaks to the geography of interest: Northern Nigeria.

ANALYSIS: NORTHERN NIGERIAN FACTORS AND PREFERENCES

Northern Nigeria is a unique area with distinct factors. This unique environment results in specific influences on caretakers. Literature highlights these five key factors which are particularly influential in Northern Nigeria:

1) **Insular Community with Influential Gatekeepers:** Several layers of opinion leaders and gatekeeps, mostly male, heavily influence vaccine demand. The community trusts one another highly, but outsiders less so.
    a. "...many male heads of households opposed allowing their wives to seek immunizations for their children, or opposed to immunization in general" - (7)
    b. "According to the FGDs, young women appeared to resort first to the elders (older men) in the communities for answers to their immunization questions or to the members of the WDC and CDA, who then would point them to the health workers." - (8)

2) **Perception that Vaccination as Incompatible with Beliefs**: Muslims, often educated in Madrasas, may believe that God should be trusted to cure and prevent illness. Husbands believe women should not interact with health providers outside the home, particularly males.
    a. "The misunderstanding (regarding resistance to the polio vaccines) was as a result of misconception of the position of Islam on the issue" - (Aliu Ma'awuya's, Health official (9))
    b. "...because I have not seen any quote in the Holy Quran that say immunization is good"(IDI, female refusal, urban, (10))

3) **Nomads have Fewer Touchpoints** - Lack of service from health providers who struggle to intersect with these communities.
    a. "The northern Hausa population is very mobile, moving in and out of their home villages in Niger to work in Nigeria during the rainy season... On top of that there is a substantial nomadic population whose movements are often poorly understood." - (11)
    b. "Geographic spread and seasonal migration patterns of nomadic communities significantly influence vaccination strategies" - (12)

4) **Politically Motivated Barriers**: Anti-polio propaganda driven by a rejection of western ideals is interwoven with conflict and violence against vaccinators which prevents access.
    a. "Polio vaccinations just became a pawn in their larger strategy to secure more resources from the Federal Government." - WHO official (13)
    b. "They (parents of poliomyelitis susceptible children) refuse to have their children vaccinated not because they fear the vaccine, but because it is their only means of protest against a health system, they feel is failing them." - (11)

5) **Fears of Infertility**: Fear that vaccines contain family planning ingredients along with belief that Polio is caused by mystical, spiritual, witchcraft forces lead to lower motivation to be immunized.
    a. "There is still that level of nonbelief that polio exists . . .somehow people still believe polio is linked with family planning and population control, we have spoken to our people, most especially the Muslims to disabuse their minds that polio immunization is family planning in disguise or a bid to reduce population." -Salma Ikolo, Borno state health commissioner (9).

Northern Nigeria: Factors of vaccine demand among Hausa community in Zamfara state

Specific communities within Zamfara state had distinct factors impacting their vaccine acceptability and other demand factors. The results of a household survey among parents with children under age five in Nahuche, Zamfara State by Ozawa et.al. reported distinct factors deemed important by caretakers to aid policymakers prioritize resources to increase awareness and demand for childhood immunization (14). Notably, statements related to trust and norms (media coverage, institutional mistrust, and social norms) were ranked the highest. Meanwhile, other factors highlighting the perceived vaccine benefits and risks (vaccine doses, potential benefits and harm), healthcare service and vaccine information (care seeking and decision-making roles, conflicting vaccine information), or opportunity costs (vaccination cost, availability, and access) were deemed less important, as shown in Figure 4 (14).

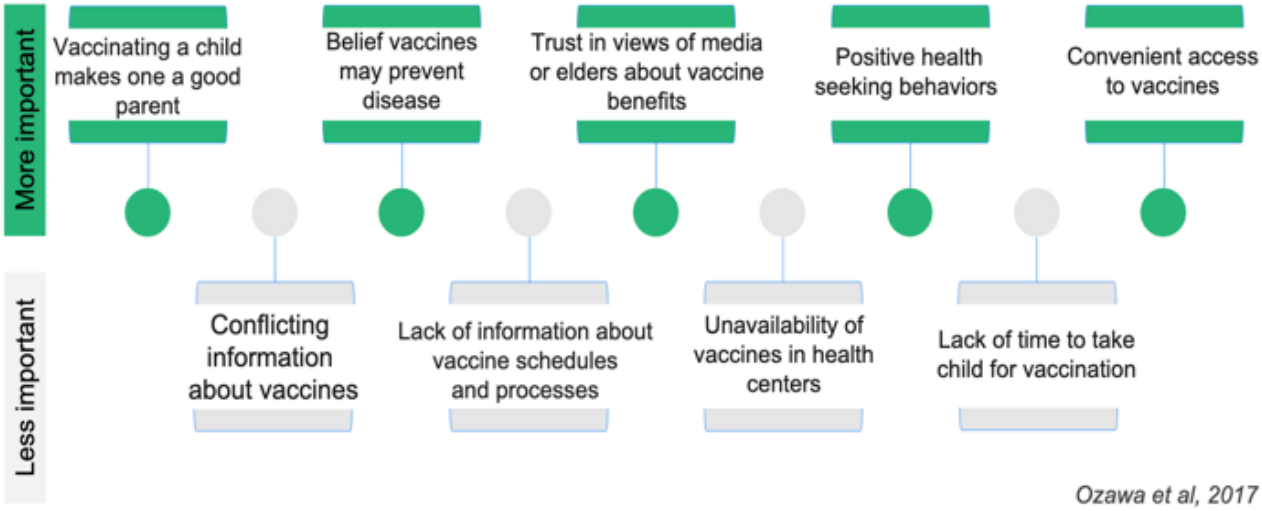

Figure 4 - Zamfara State Hausas: Importance Of Factors On Vaccine Demand

Northern Nigeria: Preferences among Hausa community in Zamfara State

Preferences of parents regarding the modes of vaccine or healthcare delivery, incentives, integrated services, leaders, and government priorities within the Zamfara state Hausa community were also highlighted by Ozawa et. al. (15). This survey-based study reported that the most preferred modes were door-to-door vaccinations, free food supplements, integrated nutritional support programs, involvement of religious leaders, information dissemination through media campaigns, and strengthening of health services by the government, as shown in Figure 5.

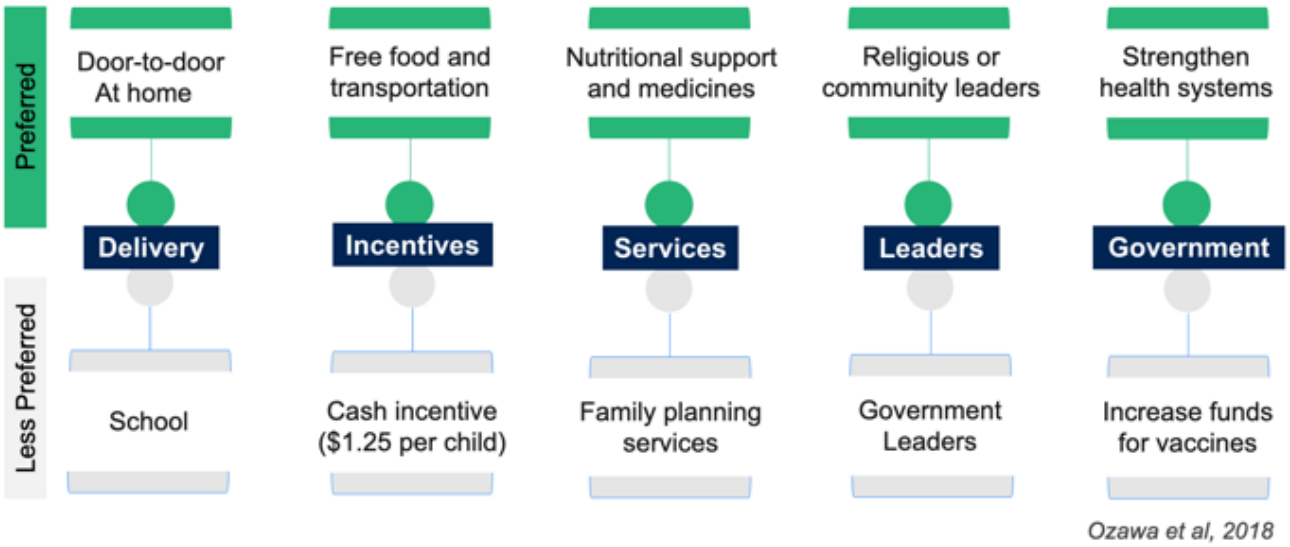

Figure 5 - Zamfara State Hausas: Immunization Campaign Preferences

Analysis: Healthcare Seeking Behavior for Polio-Like Symptoms

Though much of the findings and factors influencing Vaccine acceptance and uptake are similar to those surrounding healthcare seeking behavior for polio-like symptoms, there were some distinct factors highlighted in 4 articles: one on polio myelitis, one on febrile convulsion, one on convulsion in general, and one on epilepsy. These articles showed that:

1) **Myths remain, but beliefs may be changing:** there are spiritual and traditional beliefs about the causes and cures for convulsions and other neurological symptoms such as those associated with polio myelitis. A 2002 study from Edo state show 75% of rural participants and 28% of urban participants believe that witchcraft or evil spirits cause febrile convulsion. Another study in Ibadan showed belief that convulsion was caused by spiritual attack. That said, one study in Zamfara in 2012 documented a reduction in that belief: 64% rejected the idea that polio was a spiritual problem.
    a. "Majority of Hausa/Fulani parents of children with paralytic poliomyelitis in north-west Nigeria had good knowledge and a positive attitude concerning the condition of their children. " - (16) - Zamfara, Paralytic Poliomyelitis

2) **First response to convulsion is unorthodox care at home:** when convulsion occurs, seemingly no matter the cause, the response usually involves some form of traditional care, much of which is either not helpful, or can actually be detrimental to the child. Studies show a lack of first aid knowledge, instead opening the mouth, using urine, oils, and herbs. Those in a 2022 epilepsy study who sought unorthodox treatment outside the home did so because of the cost of care and the belief in the traditional care. The Zamfara study also, showed that while traditional and unorthodox treatment 77% agreed best treatment for children with paralytic polio is to seek medical help from orthodox practitioners in government hospital (16.)
    a. "This study reveals a widespread lack of knowledge of the cause of febrile convulsion and its home management among mothers, especially those in the rural areas." - (17) - Edo State, Febrile Convulsion

3) **Orthodox care seeking is associated with age, education, location, income:** after unorthodox care occurs, those with resources and knowledge seek orthodox care outside the home. Studies showed that more education, urban residence, younger age, and higher income were associated with the use of western medicine, the use of orthodox care as the first point of care outside the home, and better understanding of the causes of convulsion. The Zamfara study showed young adults more knowledgeable about paralytic poliomyelitis, possibly due to mass media exposure
    a. "Outside the home, approximately 80% of the study population sought for care from orthodox medicine...Most of the participants in this present study had some level of formal education, and this may have contributed to the high number of parents/caregivers seeking for care from orthodox medical practitioners... Educational status of the caregivers was directly related to their choice of first point of care outside the home. About 84.2% of the caregivers used in this study had some form of formal education. This stands to reason because education is one of the determinants of health and health-seeking behaviors. Educated care- givers are more likely ready to seek for care from orthodox practitioners than the uneducated." - (18) - Anambra State, Epilepsy

4) **Family influences care decisions:** as is the case with vaccine decisions, relatives surrounding the caretaker and child are highly influential in their care. The 2022 study in the southeast of Nigeria noted that those who sought tertiary care were most motivated by healthcare workers and by their family and relations. The 2009 Ibadan study noted that mothers in law promoted myths that the use of urine could cure convulsion (19). The Zamfara study noted that grandparents were highly influential in care decisions as they were often caretakers of disabled children.
    a. "It has become clear that male domination as it affects critical decision-making during emergencies related to child health is inconsistent with present-day reality. The study argues quite forcefully that reduction in childhood deaths and in particular those associated with convulsion can be achieved with socio-economic and cultural empowerment of women. - (19) - Ibadan, Convulsion

These articles indicate that healthcare seeking behavior is determined by contextual factors and can be altered over time.

GAPS, LIMITS, AND CONSIDERATIONS

Despite significant insights from the literature, there are gaps and limitations with respect to fully understanding the complexity of factors in Northern Nigeria. These include:

- Appropriate representation of the Fulani Community: The literature often groups data for the Fulani with that of the Hausa. This aggregation complicates understanding of community-specific dynamics affecting immunization- seeking behaviors among Fulani caregivers.

- Representation of the full range of immunization delivery strategies: Data comparing different immunization strategies, such as door-to-door campaigns versus routine clinic visits, is lacking. Insights into the effectiveness of various approaches in Northen Nigeria is critical for improving vaccination initiatives.

- Capturing the complexity of family structure and its influence on care seeking behavior: The effects of diverse family structures, such as polygamous households, on vaccination uptake

are poorly documented, impacting understanding of how familial contexts influence health behaviors for caregivers.

- Information on accessing vulnerable populations: Limited data exists on strategies to reach hard-to-access, vulnerable populations, as well as on the impact of current political environments on immunization efforts.

- Publication of survey instruments in peer-reviewed literature: Few published articles provided their study instruments, such as questionnaires and focus group discussion guides, restricting the team's ability to fully evaluate previous data collection methods.

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APPENDIX

Vaccine search	Global Index Medicus	((gender OR women OR woman OR mother OR maternal OR adolescent girls) OR polio*) AND (Nigeria OR Cameroon OR Benin OR Chad OR Niger) AND ("immunisation program" OR "immunisation programs" OR "immunization program" OR "immunization programs" OR "immunisation campaign" OR "immunisation campaigns" OR "immunization campaign" OR "immunization campaigns" OR "vaccine demand" OR "vaccine accept*" OR "vaccine coverage")
	PubMed	((gender OR women OR woman OR mother OR maternal OR reproductive OR adolescent girls) OR polio*) AND (Nigeria OR Cameroon OR Benin OR Chad OR Niger) AND ("immunization programs"[MeSH Terms] OR "immunisation program*" OR "immunization program*" OR "immunisation campaign*" OR "immunization campaign*" OR "Vaccination Coverage" OR "vaccine accept*" OR "vaccine demand") AND (english[Filter]) AND (2008:3000/12/12[pdat])
Health-Seeking Behavior search	PubMed	(polio* OR paraly* OR Seizure* OR "guillain barre" OR "acute flaccid myelitis" OR AFM OR AFP OR accute flaccid paralysis) AND (gender OR women OR woman OR mother OR maternal) AND (Nigeria OR Cameroon OR Benin OR Chad OR Niger OR ghana OR Mali OR west africa OR sahel) AND (child OR children OR infant) AND (health-seeking OR "care seeking"[tiab:~1] or traditional healer or natural healer or traditional medicine or natural medicine)