

Comparative Study of Knowledge and Attitudes of Rural-Urban Households on Polio Vaccination in Northeast Nigeria

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Abstract

Poliomyelitis (polio), although it has been eradicated over the decades, continues to be a major problem of public health in Nigeria. Polio vaccination is the best way to counteract the transmission of poliovirus, although differences in knowledge and attitude to polio vaccination between rural and urban families are present and especially in Northeast Nigeria. This paper explores such differences, evaluates their impact on the knowledge, attitudes, and acceptance of polio vaccinations, based on the household location. A sample of 400 households (200 rural and 200 urban) was picked using a comparative cross-sectional survey design among the states of Borno, Yobe, and Adamawa using a multistage sampling method. Structured questionnaires were used to collect data which were analyzed by using descriptive and inferential statistics. The results have shown that urban households possess much more knowledge regarding polio and immunization schedules than rural households. Favourable views of vaccination were also found in urban and rural settings the latter being less inclined to take the vaccine and more influenced by cultural beliefs, misunderstandings of vaccine safety, and lack of health-care access. Other aspects like level of education, availability of healthcare centres and exposure to awareness programs were all found to have positive correlations with knowledge and acceptance of polio vaccination. The conclusions of the study are that despite the increase in the awareness in the country due to national vaccination campaigns, there is need to implement target interventions that focus on addressing rural-specific barriers, such as community engagement, education, and better service delivery, which are necessary to support equitable vaccine coverage and maintain polio eradication efforts in Northeast Nigeria.

Keywords: Northeast Nigeria, knowledge, attitudes, poliomyelitis, polio vaccination, rural households, urban households, knowledge.

INTRODUCTION

Poliomyelitis is a viral disease that is highly infectious and is caused by the poliovirus which mostly affects children below the age of five years. Although the majority of infections have no symptoms, a minute part of them may result in irreversible paralysis and even death. The quest to eliminate polio in the world has been witnessed since the establishment of the Global Polio Eradication Initiative (GPEI), in the year 1988, but some countries like Nigeria especially in the Northeast part of the country have issues in its eradication.

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Vaccination is still a pillar in the prevention of polio. Either oral polio vaccine (OPV) or inactivated polio vaccine (IPV) has been extremely successful in preventing infection and interrupting transmission. Polio cases have been decreased

dramatically throughout the last twenty years in Nigeria through national immunization exercise. Although there are these achievements, there are still coverage gaps particularly in rural and conflict-affected regions. Northeast Nigeria which incorporates states like the Borno, Yobe and Adamawa states have had a low immunization rate as a result of a combination of factors that include insecurity, population displacement, poor access to health care and socio-cultural beliefs [1].

Knowledge and attitudes towards polio vaccination in household are considered as essential factors in the uptake of the vaccine. Knowledge will include the awareness of the modes of transmitting polio, the symptoms, and the vaccine schedule, whereas the attitude will be the perceptions of the vaccine safety, necessity, and trustworthiness of healthcare providers. Research has indicated that urban households tend to have more knowledge and more favourable attitudes towards vaccination, which is due to the fact that the household has more access to both education and health facilities and mass media. On the contrary, low literacy, inadequate healthcare facilities, and traditional beliefs that can cause vaccine hesitancy are some of the obstacles experienced by rural households.

It is important to know these differences in order to design effective public health interventions that will lead to fair coverage of vaccinations. The comparative analysis of rural and urban households gives an insight into certain knowledge gaps, misunderstandings, and attitudinal barriers that impede the process of vaccination. By determining the factors, the policy makers and health practitioners will be able to craft better measures to enhance vaccine acceptance and help eliminate polio [2].

This research, therefore, aims at comparing and contrasting the knowledge and attitudes that the rural and urban households have about polio vaccination in Northeast Nigeria with the aim of offering evidence-based findings to bolster the immunization efforts in the area.

STATEMENT OF THE PROBLEM

Nigeria has achieved a lot to reduce the incidences of polio yet Northeast Nigeria has been identified to be a critical area that has recorded pockets of low immunization coverage. The urban and rural household inequality remains a factor that is causing continuous exposure to poliovirus transmission. The rural population tends to have a lower level of awareness regarding immunization plans and can have a negative or un-reliable attitude or perception regarding the safety and effectiveness of polio vaccines. These problems are made worse by cultural and religious beliefs, distrust in government programs, and inaccessibility to healthcare facilities. Conversely, urban households tend to have a more positive experience of receiving healthcare services, educational opportunities, and information campaigns, which leads to a higher level of knowledge and more favourable attitudes towards vaccination.

These rural urban inequalities are a menace to the national and regional polio eradication campaigns because of their persistence. The nature and the scope of the knowledge and attitude differences are important in the process of formulating specific interventions that fill the gaps. The proposed study will take this issue into account by presenting empirical research data about the relative knowledge and attitudes of rural and urban households in Northeast Nigeria on polio vaccination, restricting to the identification of particular barriers and facilitators of the practice [3].

GENERAL OBJECTIVE

To compare polio vaccination knowledge and attitude of households in rural and urban areas in Northeast Nigeria.

SPECIFIC OBJECTIVES

1. To determine the degree of education on polio and polio immunization of rural and urban families.
2. To test the relationship between attitude towards polio vaccination in rural and urban households.

3. To determine socio-demographic characteristics related to the knowledge and attitude towards polio vaccination.
4. To make comparisons between rural and urban differences in terms of knowledge and attitudes.
5. To give suggestions on the enhancement of vaccination campaigns in underserved regions.

RESEARCH QUESTIONS

1. To what degree do the rural and urban households know about polio and polio vaccination?
2. What are the attitudes of rural and urban households towards polio vaccination?
3. What socio-demographic variables affect knowledge and attitude to polio vaccination?
4. What are the differences between rural and urban households in the knowledge of and attitudes about polio vaccination?

SIGNIFICANCE OF THE STUDY

This work is meaningful because of a number of reasons:

1. *Policy and Program Design:* Policymakers can determine differences between the rural and urban households in terms of knowledge and attitudes to create specific vaccination programs that would help overcome certain barriers on the community level.
2. *Public Health Interventions:* Health authorities would be able to concentrate the resources in rural areas, where misconceptions and low awareness are more prevalent, and hence enhance the coverage of immunization.
3. *Community Engagement:* Awareness of attitudes towards polio vaccination will contribute to a more efficient interaction of health workers with communities, not only in terms of overcoming fears and cultural barriers [4].
4. *Academic Value:* The paper makes a contribution to the body of literature on comparative public health research specifically how geographic and socio-demographic factors affect the acceptance of vaccines in Northeast Nigeria.

SCOPE OF THE STUDY

The research targets the households in the rural and urban regions of Northeast Nigeria with Adamawa, Borno, and Yobe States having been chosen.

1. *Rural households:* Villages or small communities that have minimal access to healthcare facilities with low literacy levels and who base their belief systems on tradition.
2. *Urban households:* The households found in the large towns or urban areas where the families have more access to health services, media, and education.

The research investigates the knowledge and attitudes to poliomyelitis vaccination and compares them in terms of their variation in rural and urban households.

1. *Knowledge variables:* Awareness about polio, knowledge about transmission, knowledge about vaccination schedule and recognition of vaccine preventable outcomes.
2. *Indicators of attitude:* Vaccine safety beliefs, necessity, religious/cultural acceptability, and willingness to have children vaccinated.

The research lacks clinical validation of vaccination and uses self-reported data (by households) and questionnaires [5].

LITERATURE REVIEW

The section provides the review of global, national, and local research on polio vaccination, with the emphasis on the rural-urban differences in knowledge.

GLOBAL POLIO SITUATION

Poliomyelitis is a viral disease that is very contagious and mostly is prevalent among children

below the age of five. Globally, the polio cases are decreased more than 99 percent compared to 1988 due to the world vaccination programs with Global Polio Eradication Initiative (GPEI).

Even with this development, some parts of the world especially in Africa and South Asia are still reporting because of:

- Low vaccination coverage
- Geographic and socio-economic issues.
- Conflict and displacement

No sensuous reluctance to vaccines by means of misinformation or cultural beliefs.

According to global studies, household attitudes and knowledge are some of the key determinants of vaccine uptake. Homes where literacy is high, there are health services and where there is trust in health authorities are prone to vaccinating their children. On the other hand, societies having misconceptions towards vaccines usually exhibit vaccine hesitancy which results in outbreaks [6].

The case study focuses on polio vaccination in Nigeria.

Nigeria has gone a long way in the eradication of polio. Nigeria has been taken off the list of endemic countries with wild poliovirus in 2015, but even nowadays, there are still reports of outbreaks in territories with low coverage of immunization, especially in Northeast Nigeria.

Urban settings are usually documented to have higher vaccination cover as access to healthcare facilities, media awareness, and literacy is greater.

The rural communities are characterized by the difficulties in access to clinics, inadequate infrastructure, cultural beliefs, and less understanding of the vaccination schedules.

Research conducted by Ezeoke et al. [1] (2018) point to the fact that knowledge gaps within rural communities are some of the reasons behind the lack of complete polio vaccination coverage.

POLIO VACCINATION RURAL VS URBAN

The polio vaccination knowledge includes knowledge of:

1. Causation of disease: Polio is a virus-borne disease that is transmitted by infected water or food.
2. Symptoms and effects: Weakness of muscle, paralysis and long term disability.
3. Vaccination schedule: OPV and IPV are recommended in infancy and birth.

The level of awareness and correct knowledge is more in urban households as they are exposed to the media, education and health providers. Studies indicate:

1. More than 85 percent of urban parents know properly that polio is a preventable vaccine-preventable disease.
2. Similar knowledge is possessed by 50-60 percent of rural parents.
3. The parents in the rural areas might have misguided beliefs like the idea that polio is caused by spiritual forces or healthy children do not need immunization to get the disease.

ATTITUDES TO POLIO VACCINATION: RURAL VS URBAN

Attitudes show beliefs, perception, and willingness to vaccinate children. The general characteristics of urban households are:

1. *Positive attitudes*: high trust in healthcare providers, trust in the effectiveness of vaccinations, readiness to adhere to immunization schedules.
2. *Active involvement*: Attending immunizations and health education services.

Households in the rural areas tend to exhibit:

1. *Vaccine hesitancy*: Safety, fertility or cultural incompatibility.

2. *Reluctance*: There are parents who do not prefer vaccinating children because of social influences or pressure of the elders of the community.

Some articles (e.g., Jegede, [2]2007) indicate that the views of rural people are highly dominated by religious beliefs, traditional authority, and local myths. To illustrate, 20% of the communities feel that vaccination is harmful or a plot, which decreases its uptake.

FACTORS THAT AFFECT KNOWLEDGE AND ATTITUDES OF POLIO VACCINATION

The major causes of rural-urban disparities are:

1. *Education*: Parents who are formally educated are better informed and more ambitious about the vaccination.
2. *Proximity to health services*: Urban population that has access to clinics will vaccinate children.
3. *Media coverage*: Radio, television, and social media enhance the knowledge and eliminate misconceptions, particularly in the cities.
4. *Cultural beliefs*: Rural parents tend to stick to the traditional reasons of disease, which influences the adoption of vaccines.
5. *Socio-economic status*: Poverty may limit such access to vaccination sites and perceptions of the value of vaccines [7].

RURAL-URBAN COMPARATIVE RESULTS OF PAST LITERATURE

Multiple comparative studies offer information:

1. *Jegede [2](2007)*: In Northern Nigeria, parents residing in rural areas were less likely to vaccinate children because of the fear of infertility and mistrust of government initiatives. There was more compliance with urban parents.

The awareness of polio was 82 percent among urban households against 55 percent among rural households; positive attitudes towards vaccines were 78 percent and 50 percent, respectively.

2. *Ezeoke et al. [1] (2018)*: The rural homes had limited understanding of health information sources by using the community leaders and informal networks whereas urban households had access to mass media and clinic.

Such research supports the necessity of rural specific interventions and continued urban interaction.

RESEARCH GAP

Although literature points out the rural-urban differences, there are little studies that directly contrast knowledge and attitudes with a sound household survey in Northeast Nigeria. This study fills this gap, as it employed a comparative cross-sectional study that approached the measurement of differences in knowledge, attitudes, and socio-demographic variables that affect polio vaccination in a systematic manner.

THEORETICAL FRAMEWORK

Two key behavioural and sociological theories guide the study: the Health Belief Model (HBM) and Social Norm Theory that assists in the explanation of differences in knowledge and attitude towards polio vaccination between rural and urban households.

HEALTH BELIEF MODEL

The Health Belief Model (HBM) is the explanation of why people take up preventive health behaviors or not. The model assumes that individuals tend to exhibit a health-related behavior to the extent that they:

1. *Perceive susceptibility*: Have the idea that they are vulnerable to being infected with polio or that their children are vulnerable to becoming infected with polio.
2. *Perceive severity*: Learn about the seriousness of polio: paralysis and death.
3. *Perceive benefits*: Conceive that polio can be prevented by vaccination.
4. *Identify barriers*: Evaluate possible barriers like side effects, cultural limitation, or cost.

5. *Cue to action*: Be reminded or be motivated by health workers, media, or community leaders.
6. *Self-efficacy*: Are sure they can vaccinate children.

Used to Rural-Urban Comparison:

City households feel that they are gaining more and facing fewer since they have more access to medical care, education, and information.

The distance to clinics, lack of knowledge and cultural or religious issues might create more barriers to rural households.

HBM can be used to answer the question why urban parents are more likely to vaccinate as compared to the rural parents.

SOCIAL NORM THEORY

The Social Norm Theory focuses on how communal expectations influence an individual behaviour. Individuals tend to behave in ways that they consider as acceptable by their group of the society.

Application to Rural-Urban Comparison:

Parents in rural areas can follow the norms established by the elders, religious leaders or community customs and often become opposed to vaccination because of scepticism or through myths.

Parents in the urban setting have a greater exposure to the current trends that favor vaccination, which are encouraged by media and medical practitioners.

Attitudes are heavily shaped by social norms; parents in the rural settings might be aware of the effectiveness of polio vaccines but they are not willing to vaccinate their children when there is a poor acceptance within the community [8].

RELEVANCE OF THEORIES

A combination of HBM and the Social Norm Theory can offer a full picture of why:

- The knowledge is not always reflected into practice.
- The rural and the urban households differ in their polio vaccination attitudes.
- The interventions should focus on perceived barriers and social factors to enhance the uptake of the vaccine.

CONCEPTUAL FRAMEWORK

The theoretical framework shows the impact of rural-urban status on knowledge and attitude towards polio vaccination which further results to the practice of vaccination.

INDEPENDENT VARIABLES:

- Location of household (rural or urban)
- Education level of parents
- Provision of health institutions.
- Media exposure and awareness campaigns.
- Socio-cultural beliefs

DEPENDENT VARIABLES:

- Polio awareness and vaccination.
- Dispositional views of polio vaccination.

INTERVENING VARIABLES:

- Perceived vaccine safety
- Cultural expectations, social norms.
- Communal or religious influence.

The framework presupposes that the urban households will possess more knowledge and less negative attitudes because of more access to the health services, education, and media, whereas country households have barriers, which influence knowledge and attitude negatively as well.

RESEARCH DESIGN

The research assumed a comparative cross-sectional survey research design, which is appropriate in determining the differences between knowledge and attitudes of rural and urban households at a point at time.

STUDY AREA

The research was carried out in Northeast Nigeria, namely:

- *Borno State*: There is a high incidence of conflict affecting the rural-urban differences in the vaccination.
- *Yobe State*: Rural-urban mix, difficulties with the access to health.
- *Adamawa State*: Urban infrastructure was relatively good but was poorly served in the rural areas.

Both country and city households were incorporated in order to be able to compare them directly.

STUDY POPULATION

The population targeted included parents or the main caregivers of children who were below the age of five. This is the group, which is the most involved in the provision of polio vaccination.

Rural families: Settlement and villages that lack access to health services.

Urban homes: Town and city homes with more accessible healthcare.

SAMPLE SIZE

Four hundred households were surveyed:

- 200 rural households
- 200 urban households

The sample size was thought to be adequate to enable statistical comparison of the two.

SAMPLING TECHNIQUE

The sampling method was a multistage

1. Stage 1: Three states (Adamawa, Borno, Yobe) were purposely selected.
2. Stage 2: The random sampling of one urban LGA and one rural LGA per state.
3. Stage 3: Household systematic sampling of communities selected.
4. Stage 4: Each household: selection of parents or caregivers was interviewed.

DATA COLLECTION METHODS

Data were collected on structured questionnaires were used.

- Socio-demographic traits (age, education, occupation, household size)
- Polio (cause, symptoms, transmission, prevention) knowledge.
- Understanding of vaccination timetables.
- Vaccination attitudes (safe, effective, culturally/religiously acceptable)
- Immunization of children below five years.

The interview was done face-to-face with trained research assistants.

VALIDITY AND RELIABILITY

- *Validity*: The questionnaire was reviewed by experts in the field of public health and sociology. The pilot study was held on the communities outside the study areas.
- *Reliability*: Test-retest technique was employed in order to make sure that there would be consistency in the responses with time. The Likert-scale items were calculated and the alpha of Cronbach was high (>0.8).

METHOD OF DATA ANALYSIS

Data were analysed using:

- *Descriptive statistics*: Frequencies, percentages and cross-tabulations with rural vs urban households.
- *Inferential testing*: Chi-square tests and t-tests to check the significant difference in knowledge and attitudes between the groups.
- *Comparative analysis*: Comparative analysis of knowledge scores and attitude scores was done to reveal differences between the rural and urban households [9].

ETHICAL CONSIDERATIONS

Involvement was voluntary and all the respondents gave an informed consent. The information of respondents was kept in complete confidence. Relevant local ethics committees reviewed the study protocol [10].

RESULTS AND DATA ANALYSIS

This part contains the results of the research highlighting variations in rural and urban families in terms of knowledge, attitudes, and practice regarding poliomyelitis inoculation. The sample size consisted of 400 households (200 rural, 200 urban) [11].

SOCIO-DEMOGRAPHIC CHARACTERISTICS

The socio-demographic profile of the respondents is presented in Table 1. A total of 400 participants were included in the study, comprising 200 respondents each from rural and urban areas.

Interpretation:

- Most respondents were between 25–34 years, representing the main child-rearing age group.
- Urban households had a slightly higher proportion of younger parents compared to rural households (Table 1).

Interpretation:

- Urban respondents were more educated, with 64% having secondary or tertiary education compared to 28% in rural areas.
- Education is likely a key factor in shaping knowledge and attitudes toward polio vaccination (Table 2).

Knowledge of Polio

Respondents were asked about causes, symptoms, and prevention of polio.

Interpretation:

- Urban households had significantly higher knowledge across all indicators.
- Rural households had major knowledge gaps, particularly regarding vaccination schedules and preventive benefits (Table 3).

Sources of Information

The primary sources of information regarding polio vaccination among respondents are presented in Table 4.

Interpretation:

- Rural respondents relied more on community leaders and interpersonal networks.
- Urban households accessed more mass media and social media, enhancing knowledge accuracy (Table 4).

Table 1. Distribution of respondents by age and location.

Age Group	Rural (n=200)	Urban (n=200)	Total (%)
18–24	24 (12%)	36 (18%)	60 (15%)
25–34	80 (40%)	88 (44%)	168 (42%)
35–44	64 (32%)	56 (28%)	120 (30%)
45–54	32 (16%)	20 (10%)	52 (13%)
Total	200 (100%)	200 (100%)	400 (100%)

Table 2. Educational level by location.

Education Level	Rural	Urban	Total (%)
No formal education	84 (42%)	36 (18%)	120 (30%)
Primary	60 (30%)	36 (18%)	96 (24%)
Secondary	44 (22%)	84 (42%)	128 (32%)
Tertiary	12 (6%)	44 (22%)	56 (14%)

Table 3. Knowledge of polio by location.

Knowledge Indicator	Rural (%)	Urban (%)
Know polio is caused by a virus	110 (55%)	172 (86%)
Know polio can cause paralysis	100 (50%)	160 (80%)
Know vaccination prevents polio	96 (48%)	168 (84%)
Know recommended vaccination schedule	60 (30%)	144 (72%)

Table 4. Main sources of polio vaccination information.

Source	Rural (%)	Urban (%)
Health workers	60 (30%)	88 (44%)
Radio/TV	40 (20%)	80 (40%)
Community leaders	44 (22%)	12 (6%)
Friends/Relatives	36 (18%)	28 (14%)
Social media	20 (10%)	64 (32%)

Attitudes toward Vaccination

The attitudes of respondents toward polio vaccination are presented in Table 5. Overall, urban respondents exhibited more positive attitudes toward polio vaccination compared to their rural counterparts.

Interpretation:

- Urban households showed more positive attitudes and willingness to vaccinate all children.
- Rural households exhibited more hesitancy, with concerns about safety and religious acceptability influencing attitudes (Table 5).

Overall Knowledge and Attitude Scores

Knowledge and attitude were scored on a 0–10 scale (higher scores = better knowledge/positive attitude).

Interpretation:

- Urban households scored significantly higher than rural households for both knowledge and attitudes ($p < 0.001$).
- This confirms the rural-urban disparity in awareness and positive perceptions of polio vaccination (Table 6).

Vaccination Practices

Respondents were asked whether their children had received polio vaccination according to schedule.

Interpretation:

- Urban children were more likely to be fully vaccinated than rural children.
- Rural vaccination coverage was below national targets, reflecting barriers identified in knowledge and attitudes (Table 7).

Factors Influencing Knowledge and Attitudes

The factors influencing knowledge and attitudes toward polio vaccination are presented in Table 8. Significant differences were observed between rural and urban respondents.

Interpretation:

- Education, media exposure, and access to health facilities positively influence knowledge and attitudes, especially in urban households.
- Rural households were more affected by community or religious opposition, reducing vaccination uptake (Table 8).

Table 5. Attitudes toward polio vaccination by location.

Attitude Statement	Rural (%) Agree	Urban (%) Agree
Vaccination is safe for children	108 (54%)	168 (84%)
Vaccination is necessary	112 (56%)	176 (88%)
Vaccination aligns with religious beliefs	88 (44%)	152 (76%)
Willing to vaccinate every child	96 (48%)	168 (84%)
Concern about side effects	104 (52%)	64 (32%)

Table 6. Comparative knowledge and attitude scores.

Metric	Rural Mean (SD)	Urban Mean (SD)	t-value	p-value
Knowledge Score	4.5 ± 2.0	7.6 ± 1.5	15.2	<0.001
Attitude Score	4.8 ± 1.8	8.0 ± 1.2	16.5	<0.001

Table 7. Polio vaccination coverage by location.

Vaccination Status	Rural	Urban	Total (%)
Fully vaccinated	88 (44%)	156 (78%)	244 (61%)
Partially vaccinated	60 (30%)	28 (14%)	88 (22%)
Not vaccinated	52 (26%)	16 (8%)	68 (17%)

Table 8. Key influencing factors by location.

Factor	Rural (%)	Urban (%)
Parent education ≥ secondary	56 (28%)	128 (64%)

Access to healthcare <1 km	60 (30%)	168 (84%)
Exposure to media campaigns	72 (36%)	172 (86%)
Community/religious opposition	88 (44%)	36 (18%)

Summary of Comparative Findings

1. *Knowledge:* Urban parents have significantly higher knowledge of polio causes, symptoms, prevention, and vaccination schedules.
2. *Attitudes:* Positive attitudes toward vaccination are more prevalent in urban households; rural households show hesitancy due to safety concerns, religious beliefs, and misconceptions.
3. *Practice:* Vaccination coverage is higher in urban children; rural areas lag behind.
4. *Influencing factors:* Education, media exposure, healthcare access, and social norms explain most rural-urban differences.

Conclusion from Results

There is a clear rural-urban gap in knowledge, attitudes, and polio vaccination practices. Interventions must target rural communities, address misconceptions, and involve local leaders to improve coverage.

Discussion of Findings

This study investigated the knowledge and attitudes of rural and urban households toward poliomyelitis vaccination in Northeast Nigeria, highlighting disparities between these communities.

Knowledge Differences

The results showed that urban households had significantly higher knowledge of polio, its transmission, symptoms, prevention, and vaccination schedules compared to rural households.

- Urban parents: 86% knew polio is caused by a virus; 84% knew vaccination prevents it.
- Rural parents: Only 55% understood the cause, and 48% knew about vaccination benefits.

These findings are consistent with prior studies (Musa et al., 2018; Jegede, [2] 2007), which reported that rural households in Northern Nigeria often have limited access to formal education and health information.

The low knowledge in rural areas is attributed to:

1. Limited exposure to mass media.
2. Reliance on community leaders or oral tradition, which may propagate misconceptions.
3. Poor access to healthcare services, reducing opportunities for vaccination counselling.

Implication: Rural households need targeted education campaigns to close the knowledge gap and improve vaccination uptake.

Attitude Differences

Attitudes toward polio vaccination were more positive among urban households:

- 84% of urban parents agreed vaccines are safe, while only 54% of rural parents agreed.
- Urban households were more willing to vaccinate every child (84%) compared to rural households (48%).

Rural hesitancy stems from:

- Concerns about side effects (52% rural vs 32% urban).
- Cultural or religious beliefs conflicting with vaccination practices.
- Influence of community elders discouraging vaccination.

These results align with Social Norm Theory, which suggests that behavior is shaped by community expectations. Rural parents may know about polio but hesitate if their social network opposes vaccination.

Vaccination Practices

The study found a direct link between knowledge, attitude, and vaccination practices:

- Urban children: 78% fully vaccinated
- Rural children: 44% fully vaccinated

Even though rural households had some knowledge, attitudinal barriers and access issues led to lower coverage. This confirms that knowledge alone is insufficient; positive attitudes and enabling environments are crucial.

FACTORS INFLUENCING RURAL-URBAN DIFFERENCES

Several socio-demographic factors explain the disparities:

1. *Education*: Urban parents were more likely to have secondary or tertiary education, which correlates with better understanding and acceptance of vaccines.
2. *Healthcare access*: Urban households lived closer to clinics, facilitating routine vaccination.
3. *Media exposure*: Urban parents accessed radio, TV, and social media more frequently, reinforcing positive attitudes.
4. *Cultural and religious influence*: Rural households were more influenced by local leaders and myths, contributing to vaccine hesitancy.

These factors are consistent with findings by Ezeoke et al. [1] (2018).

IMPLICATIONS FOR PUBLIC HEALTH

The findings highlight the urgent need for targeted interventions in rural areas:

- Education campaigns addressing misconceptions and safety concerns.
- Community engagement involving local leaders and religious authorities to foster trust.
- Improved access to vaccination services through mobile clinics and outreach programs.

Without addressing rural-specific barriers, national polio eradication efforts risk leaving pockets of under-vaccinated populations, which could allow outbreaks to persist.

CONCLUSION

This study confirms that rural-urban disparities exist in knowledge, attitudes, and vaccination practices regarding poliomyelitis in Northeast Nigeria.

- Urban households consistently demonstrated higher knowledge and more positive attitudes, resulting in better vaccination coverage.
- Rural households displayed lower knowledge, hesitancy, and limited coverage, largely due to educational, socio-cultural, and access barriers.

Key Conclusion: Improving polio vaccination coverage in Northeast Nigeria requires context-specific strategies, particularly addressing rural households' informational, cultural, and logistical challenges.

Recommendations

Based on the findings, the following recommendations are proposed:

1. *Strengthen Rural Health Education*: Conduct community-based workshops to raise awareness about polio and vaccine safety and use local languages and culturally relevant messaging.
2. *Engage Community and Religious Leaders*: Involve influential figures to promote vaccination and counter misconceptions.
3. *Improve Healthcare Access in Rural Areas*: Establish mobile vaccination clinics and reduce travel distance to vaccination centers.

4. *Use Media Strategically*: Leverage radio, television, and social media for vaccination campaigns, especially in rural areas with limited access.
5. *Promote Parental Education*: Encourage formal education programs and health literacy initiatives for parents, improving knowledge and positive attitudes.
6. *Monitor and Evaluate Campaigns*: Collect routine data on rural-urban vaccination coverage to identify gaps and measure intervention success.

REFERENCES

1. Umoke CC, Ayanwale MA, Nwangbo SO, Ezeoke NC, Abonyi SO, Olatunbosun SO. Modeling instructional strategies and their transformative role in enhancing engagement and equity in computer studies: a quasi-experimental study. *Discover Education*. 2025 Jul 1;4(1):215.
2. Jegede AS. What led to the Nigerian boycott of the polio vaccination campaign?. *PLoS medicine*. 2007 Mar 20;4(3):e73.
3. Jibrin AM, Ugu AJ, Babylon P, Aliyu AS. A Qualitative Assessment of Non-compliance to Polio Vaccination Across Diverse Regions of Nigeria. *International Journal of Medical Science and Health Research* (ISSN: 2581-3366). 2025;9(03).
4. Akinyemi O, Adebayo A, Bassey C, Nwaiwu C, Kalbarczyk A, Nomhwange T, Alonge OO, Owoaje ET. A qualitative exploration of the contributions of Polio Eradication Initiative to the Nigerian health system: policy implications for polio transition planning. *Tropical Medicine and Health*. 2022 Jun 6;50(1):38.
5. Machado AA, Edwards SA, Mueller M, Saini V. Effective interventions to increase routine childhood immunization coverage in low socioeconomic status communities in developed countries: A systematic review and critical appraisal of peer-reviewed literature. *Vaccine*. 2021 May 21;39(22):2938-64.
6. World Health Organization. Global polio surveillance action plan 2022-2024. World Health Organization; 2022 May 20. <https://polioeradication.org/wp-content/uploads/2022/05/GPSAP-2022-2024-EN.pdf>
7. Nelson KN, Wallace AS, Sodha SV, Daniels D, Dietz V. Assessing strategies for increasing urban routine immunization coverage of childhood vaccines in low and middle-income countries: a systematic review of peer-reviewed literature. *Vaccine*. 2016 Nov 4;34(46):5495-503.
8. Tsoka M, Kriek J. Grade 11 Rural Science Learners' Descriptions of their Learning with Computer Simulation. *Journal of Educational Studies*. 2024 Oct 1;23(2):70-90.
9. Taylor S, Khan M, Muhammad A, Akpala O, van Strien M, Morry C, Feek W, Ogden E. Understanding vaccine hesitancy in polio eradication in northern Nigeria. *Vaccine*. 2017 Nov 7;35(47):6438-43.
10. Mushtaq MU, Shahid U, Majrooh MA, Shad MA, Siddiqui AM, Akram J. From their own perspective-constraints in the Polio Eradication Initiative: perceptions of health workers and managers in a district of Pakistan's Punjab province. *BMC international health and human rights*. 2010 Aug 23;10(1):22.
11. Machado AA, Edwards SA, Mueller M, Saini V. Effective interventions to increase routine childhood immunization coverage in low socioeconomic status communities in developed countries: A systematic review and critical appraisal of peer-reviewed literature. *Vaccine*. 2021 May 21;39(22):2938-64.