



Barriers to Immunization among Children Less than Five (5) Years in Umuahia-North Abia State, Nigeria

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ABSTRACT

Background: Immunization is a vital public health strategy for preventing vaccine-preventable diseases, yet coverage among children under five years in Umuahia-North, Abia State, Nigeria, remains low. This study aims to identify the socio-cultural, economic, infrastructural, and informational barriers that contribute to this low immunization uptake.

Methodology: A descriptive cross-sectional study design was employed, with a sample size of 422 caregivers of children under five years. Data were collected via structured questionnaires. Statistical analyses, including chi-square tests and logistic regression, were conducted to assess the relationships between the identified barriers and immunization rates.

Results: The findings reveal that socio-cultural beliefs, such as reliance on traditional medicine and fears of infertility from vaccines, significantly contribute to vaccine hesitancy. Economic barriers, particularly transportation costs and lost income from work, were major deterrents. Inadequate healthcare infrastructure, including poor accessibility and vaccine shortages, also played a role. Misinformation, primarily spread through social media, further contributed to distrust in vaccines, exacerbating the problem.

Conclusion: To improve immunization coverage in Umuahia-North, a comprehensive approach is required. This includes enhancing community health education, engaging religious and traditional leaders, improving healthcare infrastructure, providing financial support to low-income families, and actively countering misinformation.

Keywords: Immunization, barriers, socio-cultural factors, vaccine hesitancy, healthcare infrastructure, misinformation, Umuahia-North, Nigeria, sample size, 422 respondents.

1. Background of the Study

Immunization has been recognized as one of the most effective and cost-efficient public health interventions globally (WHO, 2023). It plays a critical role in the prevention of vaccine-preventable diseases such as measles, polio, tetanus, and diphtheria. Over the past decades, global immunization efforts have led to the eradication of smallpox, a significant reduction in polio cases, and the near elimination of several other infectious diseases (WHO, 2023). According to the World Health Organization (WHO), global vaccination coverage in 2022 stood at 82%, yet approximately 23 million children worldwide missed out on basic vaccines in 2020, a rise attributed in part to the COVID-19 pandemic, as well as ongoing challenges in reaching certain populations (WHO, 2023).

Despite tremendous progress, immunization coverage varies widely, with low-income countries in sub-Saharan Africa and South Asia facing significant barriers. Factors such as poor healthcare infrastructure, limited funding, geographic challenges, and vaccine hesitancy impede the ability to achieve universal immunization. In high-income countries, vaccine hesitancy fueled by misinformation, particularly around the safety of vaccines, has also become a significant challenge (Larson et al., 2019).

According to the WHO, while Africa has made substantial progress through initiatives such as the Expanded Programme on Immunization (EPI), vaccine coverage remains below the 90% target set by the Global Vaccine Action Plan (GVAP).

Nigeria is one of the countries with the highest numbers of under-vaccinated children in the world, with about 3.1 million children not receiving routine immunization in 2020 (WHO, 2022). Efforts to increase immunization coverage have been hampered by a range of challenges, including insecurity in the northern regions, poor healthcare infrastructure, political instability, and a lack of consistent funding for immunization programs. Additionally, rumors

and misinformation, particularly about polio vaccines, have contributed to widespread vaccine hesitancy in certain regions of the country (Williams & Nwachukwu, 2023).

Abia State, located in the southeastern region, has made strides in public health but continues to face challenges in achieving universal immunization coverage. The state's immunization efforts are hampered by issues such as inadequate healthcare facilities, lack of trained personnel, poverty, and logistical challenges in rural areas (Chukwu & Okechukwu, 2022).

2. STUDY OBJECTIVE

- To identify the socio-cultural barriers to immunization in children less than 5 years in children less than 5 years in Umuahia-North, Abia State.
- To assess the economic factors affecting immunization uptake in Umuahia-North.
- To evaluate the impact of healthcare infrastructure on immunization coverage in children less than 5 years in Umuahia-North Abia State
- To investigate the role of misinformation and lack of awareness on immunization rates in in children less than 5 years Umuahia-North Abia State.

3. Methodology

3.1 Study Design

This study adopted a descriptive cross-sectional study design. This design is chosen because it allows for the collection of data at a single point in time, which is suitable for assessing the barriers to immunization among a population.

3.2 Study Area

The study was conducted in Umuahia-North Local Government Area (LGA), Abia State, Nigeria.

3.3 Study Population

The study population consisted of mothers or caregivers of children under the age of five years in Umuahia-North LGA. Sample size of 422 respondents were used.

3.4 Data Collection Method

Data was collected through a structured questionnaires which was administered to the selected caregivers to gather data on socio-demographic characteristics, awareness, economic status, accessibility to healthcare services, and reasons for non-completion of immunization schedules.

3.5 Data Analysis

Statistical Package for Social Sciences (SPSS) software, version 27 was used for data analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the socio-demographic characteristics of the respondents. Inferential statistics such as the chi-square test was employed to examine the association between categorical variables, such as socio-cultural and economic factors, and immunization status. Logistic regression analysis was conducted to identify the predictors of incomplete immunization.

3.6 Ethical consideration

Informed consent was obtained from all participants, no personal identifiers were collected, and the data was stored securely to protect the privacy of the participants.

4. RESULT AND DISCUSSION

4.1 Cultural Beliefs Influencing Immunization

Table 1: Cultural Beliefs Influencing Immunization

Cultural Belief	Frequency	Percentage (%)
Believe vaccines are unnatural	106	25%
Fear of infertility due to vaccines	84	20%
Preference for traditional healing	127	30%
No cultural barriers perceived	105	25%
Total	422	100%

The findings in the table 1 above show that cultural beliefs play a role in vaccination decisions, with 30% of respondents favoring traditional healing over vaccines, 25% perceiving vaccines as unnatural, and 20% fearing infertility. This suggests a need for culturally sensitive outreach, possibly involving community leaders to address misconceptions. However, the chi-square test results ($\chi^2 = 0.014$, $p = 0.907$) indicate no significant association between these beliefs and vaccine uptake. This suggests that while cultural concerns exist, they may not be direct barriers to immunization, and broader health awareness efforts could be more effective in improving vaccine acceptance.

4.2 Religious Influence on Immunization

Table 2: Religious Influence on Immunization

Religious Influence	Frequency	Percentage (%)
Religion discourages vaccination	101	24%
Vaccination seen as unnecessary	51	12%
Other religious concerns	17	4%
No religious influence reported	253	60%
Total	422	100%

The results in table 2 above indicates that religious beliefs influence 40% of respondents, with 24% discouraged from vaccination due to religious leaders' views. This highlights the need to involve religious leaders in vaccine advocacy to encourage acceptance within faith communities. The chi-square test ($\chi^2 = 171.71$, $p < 0.001$) shows a strong link between religious beliefs and immunization behavior, suggesting that religious influences significantly impact vaccination rates. Engaging religious leaders could be a key strategy in addressing vaccine hesitancy and promoting immunization.

4.3 Economic factors

Table 3: Distance to Health Facility

Distance to Health Facility	Frequency	Percentage (%)
Less than 1 km	63	15%
1–5 km	190	45%
6–10 km	105	25%
More than 10 km	63	15%
Total	422	100%

The data reveals that 40% of respondents live more than 5 km from health facilities, suggesting that accessibility may limit immunization. Those further from health facilities are likely to face challenges completing immunization schedules, pointing to the potential value of mobile health services or increased local access points.

Table 4: Logistic Regression Output

Variable	Coefficient	Std. Error	z-value	p-value	95% Confidence Interval
Intercept	0.4046	0.2611	1.549	0.121	(-0.1072, 0.9164)
Distance to Health Facility (km)	-0.0085	0.0229	-0.372	0.710	(-0.0534, 0.0364)
Transportation Cost Barrier	0.2946	0.2069	1.424	0.154	(-0.1109, 0.7001)
Lost Income Barrier	0.2497	0.2177	1.147	0.251	(-0.1769, 0.6763)

Logistic Regression Result for Distance: Coefficient = -0.0085, p = 0.710

This means that there is non-significant p-value ($p > 0.05$) suggests that distance alone does not significantly impact immunization uptake. This indicates that while distance might add inconvenience, other factors may have a more direct influence on vaccination status.

Table 5: Financial Constraints on Immunization

Financial Constraint	Frequency	Percentage (%)
Transportation costs a barrier	232	55%
Lost income from missed work	274	65%
Indirect costs as a deterrent	169	40%
Total Respondents Reporting Cost Issues	422	100%

The findings highlight significant financial barriers to vaccination, with 65% of respondents citing lost income from missed work and 55% reporting transportation costs as challenges. This suggests that initiatives like weekend immunization drives or financial support could help improve vaccine uptake. However, logistic regression results show that neither transportation costs ($p = 0.154$) nor lost income ($p = 0.251$) were statistically significant factors, indicating they may not directly impact immunization status. Still, addressing these challenges could reduce inconvenience and enhance access to vaccination services.

4.4 Vaccine availability

Table 6: Vaccine Availability at Health Facility

Vaccine Availability	Frequency	Percentage (%)
Always available	211	50%
Sometimes unavailable	169	40%
Frequently unavailable	42	10%
Total	422	100%

The findings show that while 50% of respondents report consistent vaccine availability, 40% experience occasional shortages, which may lead to missed immunization opportunities. This underscores the need to strengthen the vaccine supply chain for more reliable access. The chi-square test results ($\chi^2 = 29.33$, $p < 0.001$) indicate a strong association between vaccine availability and immunization uptake, emphasizing the importance of logistical improvements to enhance vaccination rates.

Table 7: Perception of Health Worker Knowledge

Health Worker Knowledge	Frequency	Percentage (%)
Knowledgeable	295	70%
Insufficiently knowledgeable	127	30%
Total	422	100%

Source: primary data

A notable 30% of respondents perceive a knowledge gap among health workers, which could affect their trust in vaccines. This underscores the importance of continuous health worker training on vaccination benefits and safety to enhance public confidence.

This means that health worker knowledge is generally viewed positively. However, efforts to address the perception of insufficient knowledge could improve community trust in immunization services.

Table 8: Exposure to Negative Information about Vaccines

Exposure to Negative Information	Frequency	Percentage (%)
Encountered negative information	190	45%
Did not encounter negative information	232	55%
Total	422	100%

A significant 45% of respondents encountered negative vaccine information, which likely affects immunization rates. This highlights the need for targeted communication strategies to address misinformation and reinforce positive messages about vaccine safety.

Chi-Square Test Result: $\chi^2 (1, N=422) = 1.16, p = 0.282$

This means that there is non-significant p-value ($p > 0.05$) suggests that exposure to negative information alone does not significantly impact immunization uptake. However, campaigns to counter misinformation could still be beneficial in improving community attitudes toward vaccines.

Table 9: Sources of Negative Vaccine Information

Source of Negative Information	Frequency	Percentage (%)
Social media	95	50%
Friends/family	48	25%
Religious leaders	29	15%
Community leaders/healers	19	10%
Total	190	100%

The findings reveal that social media is the main source of misinformation for half of the respondents, highlighting its impact on health beliefs. This suggests that actively engaging on digital platforms, along with support from trusted community figures, could be key in countering misinformation and promoting vaccine acceptance.

5. Conclusion

The study highlights that low immunization coverage in Umuahia-North, Abia State, is influenced by socio-cultural, economic, infrastructural, and informational barriers. Despite the availability of vaccines, many children remain under-vaccinated due to these challenges. Cultural and religious beliefs significantly impact vaccine acceptance. Some families prefer traditional medicine, fear infertility, or distrust modern healthcare, while certain religious leaders discourage vaccination, further fueling hesitancy. Economic barriers also play a role. Although vaccines are free, indirect costs like transportation and lost income prevent many low-income families from accessing immunization services, particularly in rural areas where health facilities are far away. Infrastructure challenges, including inconsistent vaccine supply, inadequate cold chain management, and poor road networks, make it difficult for families to access immunization services. Additionally, a lack of trust in healthcare workers due to perceived gaps in vaccine knowledge further reduces vaccine uptake. Misinformation, especially through social media, spreads fear and distrust about vaccine safety, making it harder for people to make informed decisions. In rural and semi-urban areas, where access to accurate health information is limited, many rely on social networks and community leaders for guidance.

To improve immunization rates, a multi-faceted approach is needed. Strengthening healthcare infrastructure, ensuring reliable vaccine supply, and addressing financial barriers are crucial steps. Engaging religious and community leaders to counter misinformation and build trust in vaccines is also essential. The study calls for urgent action through collaboration between the government, healthcare providers, and community leaders. Addressing these root causes will help increase vaccine acceptance and ensure better protection for children against preventable diseases in Umuahia-North.

6. Limitation of the study

This study has several limitations. Recall bias may affect the accuracy of caregivers' reports on their children's immunization history. Non-response bias could also arise if some caregivers choose not to participate, leading to a less representative sample. Additionally, cultural sensitivity may limit discussions on topics like religious beliefs and gender roles in immunization decisions. Lastly, logistical challenges, such as poor road conditions in remote areas of Umuahia-North, may have restricted data collection efforts.

7. Recommendation

Improving immunization coverage in Umuahia-North requires a comprehensive approach, including enhanced community health education with support from trusted leaders, strengthening healthcare infrastructure, and addressing economic barriers through financial support programs. Misinformation can

be countered through proactive social media engagement, public campaigns, and increased healthcare worker outreach. Ongoing training for healthcare workers is essential to combat vaccine hesitancy, while expanding media campaigns via radio, television, and Community Theater can further boost vaccine awareness, especially in rural areas.

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References

- Ajayi, O., & Oladimeji, O. (2021). Social media misinformation and its impact on vaccine acceptance in Nigeria. *Journal of Global Health Communication*, 9(3), 154-165.
- Akinbode, A. O., Ajiboye, A., & Okechukwu, E. (2020). The role of traditional beliefs and misinformation in vaccine hesitancy in rural Nigeria. *Journal of Public Health Research*, 11(2), 102-113.
- Bawa, H., Ibrahim, N., & Yaro, B. (2021). Economic determinants of immunization uptake in Nigeria: Evidence from household survey data. *Journal of Health Economics*, 14(2), 78-89.
- Brown, T., Adamu, A., & Musa, H. (2020). Cultural and socio-economic barriers to immunization in rural Nigeria. *African Journal of Public Health*, 18(2), 100-113.
- Chukwu, E., & Okechukwu, N. (2022). Healthcare infrastructure and immunization coverage in southeastern Nigeria: A case study of Abia State. *Nigerian Journal of Public Health*, 12(3), 78-88.
- Chukwu, E., Okoro, I., & Onyeka, U. (2020). The impact of media campaigns on vaccine acceptance in southeastern Nigeria. *Nigerian Journal of Public Health*, 13(4), 56-72.
- Duru, C. A., Onyekachi, E., & Ogochukwu, A. (2020). Local government funding for immunization programs in Nigeria: A review of challenges and opportunities. *Health Policy and Planning*, 25(1), 22-35.
- Eze, A., Ugochukwu, N., & Ikwu, A. (2021). Geographic access to healthcare and its impact on immunization coverage in rural Nigeria. *Tropical Medicine and International Health*, 26(3), 230-245.
- Ibrahim, S., & Kanu, S. (2021). Addressing vaccine hesitancy through community education. *Public Health Education Review*, 13(3), 142-155.
- Larson, H. J., de Figueiredo, A., Karafillakis, E., & Rawal, M. (2019). State of vaccine confidence in the EU 2018. *European Journal of Public Health*, 29(3), 35-40.
- Mohammed, T., Hassan, B., & Isah, A. (2021). Cold chain management and vaccine storage in rural Nigerian healthcare facilities. *Vaccine Journal of Africa*, 15(4), 211-223.
- Nwabueze, I. (2023). Vaccine hesitancy and traditional beliefs in Umuhia-North, Abia State: An anthropological perspective. *Nigerian Journal of Community Medicine*, 17(1), 25-35.
- Okafor, C., & Nwachukwu, D. (2021). Parental awareness and immunization uptake in rural Nigeria. *International Journal of Health Education*, 11(3), 110-120.
- Okafor, S., & Akinyemi, S. (2022). Sociocultural barriers to childhood immunization in West Africa. *West African Medical Journal*, 60(4), 56-67.
- Olaniyi, O., & Babalola, R. (2022). Religious opposition to vaccination in Northern Nigeria: Myths, realities, and policy responses. *Journal of Religion and Health*, 61(2), 234-245.
- Onwujekwe, O., Ogbonna, C., & Udeh, B. (2020). Barriers to immunization in rural Nigeria: Transportation and access challenges. *Health Systems and Reform*, 6(1), 101-112.
- Owolabi, D., Adeola, T., & Bolaji, A. (2021). Economic opportunity costs and vaccine hesitancy among Nigerian parents. *African Journal of Economic Studies*, 14(3), 88-102.
- Smith, J., & Johnson, L. (2021). Socio-cultural determinants of immunization in African countries. *Journal of Global Health*, 11(2), 34-45.
- WHO (2022) Immunization coverage: Nigeria. Retrieved from <https://www.who.int/data/nigeria>
- WHO Africa. (2022). DTP3 vaccine coverage in Africa. Retrieved from <https://www.afro.who.int>
- Williams, S., & Musa, H. (2020). Misinformation and its effect on vaccine uptake in Nigeria. *Global Health Communication*, 8(2), 67-78.
- Williams, S., & Nwachukwu, I. (2023). The impact of misinformation on vaccine uptake in Nigeria. *International Journal of Health Policy*, 22(1), 87-99.