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PUBLIC HEALTH INTERVENTIONS FOR CONTROL AND PREVENTION OF INFECTIOUS DISEASES IN SOME SELECTED LOCAL GOVERNMENT AREAS OF TARABA STATE

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ABSTRACT
This study examined the effectiveness of public health interventions in controlling and preventing infectious diseases and assessed the challenges affecting their implementation in rural communities of Taraba State. A descriptive survey research design was adopted, targeting healthcare workers, community health volunteers, and residents across selected communities in Wukari, Gassol, and Jalingo Local Government Areas. A total of 400 respondents were selected using a multi-stage sampling technique. Data were collected using a validated and reliable structured questionnaire, and analyzed using descriptive and inferential statistics, including chi-square and regression analysis at a 0.05 level of significance. Findings revealed that public health interventions have significantly reduced the prevalence of infectious diseases such as malaria and cholera, with high effectiveness noted in vaccination programs, clean water provision, and improved healthcare access. However, community participation and health education efforts were less effective, indicating gaps in public engagement. The study also found that implementation challenges such as inadequate funding, poor infrastructure, weak policy enforcement, and shortage of healthcare personnel significantly hindered disease prevention efforts. Regression analysis showed a strong and significant influence of public health interventions on disease control, while chi-square results indicated a significant relationship between implementation challenges and disease prevention outcomes. The study concludes that addressing these challenges is critical for improving health outcomes. It recommends increased government funding, improved infrastructure, and enhanced community engagement to strengthen public health interventions in rural areas.

Keywords: Public health interventions, infectious diseases, rural communities, disease control and prevention strategies.

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Introduction

Public health interventions are organized and deliberate strategies designed to prevent, control, and ultimately eliminate the spread of diseases within human populations. These interventions encompass a broad range of activities, including immunization campaigns, public health education, sanitation improvements, disease surveillance, and community outreach programs. They are particularly crucial in rural and underserved regions where access to quality healthcare remains limited. In Nigeria, and specifically in Taraba State, rural communities face a disproportionately high burden of infectious diseases due to a convergence of environmental, infrastructural, socio-economic, and cultural challenges that impede effective healthcare delivery.

In the rural areas of Taraba State, infectious diseases such as malaria, tuberculosis (TB), Lassa fever, and HIV/AIDS continue to pose significant threats to public health. Factors such as poor housing, inadequate sanitation, limited access to clean water, and widespread poverty have created environments that are conducive to disease transmission (Igwe *et al.*, 2024). These conditions are further exacerbated by weak health infrastructure, including understaffed and ill-equipped health centers, poor road networks, and irregular electricity supply. In response to these challenges, a number of public health interventions have been implemented. These include vaccination campaigns targeting children and vulnerable populations, the promotion of improved hygiene practices, vector control measures, and the establishment of community-based health services. Additionally, mobile clinics and health education initiatives have been introduced to reach remote areas, where conventional health services are often unavailable (Eze *et al.*, 2023).

Despite these efforts, the success of public health interventions in Taraba State remains uneven. Several implementation barriers have been documented, ranging from inadequate funding and logistics to a critical shortage of skilled healthcare personnel. Moreover, enforcement of public health regulations is often weak, and community engagement tends to be low, limiting the reach and sustainability of intervention programs (Oloruntoba *et al.*, 2024). In certain communities, resistance to modern healthcare practices—often rooted in cultural beliefs and mistrust of government-led initiatives—compounds the difficulty of achieving widespread program participation (Abubakar *et al.*, 2023). For example, in areas where road access is limited, residents are frequently unable to reach health facilities for routine immunizations, antenatal care, or emergency treatment. These access issues are particularly problematic during outbreaks, when swift intervention is critical.

In addition, socio-economic factors such as low literacy levels, unemployment, and food insecurity significantly influence health-seeking behavior. Many rural dwellers prioritize subsistence needs over healthcare, especially in the absence of health insurance or subsidized medical services. As a result, diseases like Lassa fever and malaria remain endemic in many rural parts of the state, often due to poor hygiene practices and limited awareness of preventive

measures (Igwe *et al.*, 2024). However, there have also been success stories that demonstrate the potential impact of community-based interventions. For instance, tuberculosis control efforts in Sardauna Local Government Area (LGA) have shown improvement through grassroots outreach and patient education, while HIV/AIDS initiatives that incorporate community mobilization have yielded better testing and treatment outcomes (Nzunde *et al.*, 2020; Eze *et al.*, 2023).

Crucially, effective public health intervention in rural settings depends on multi-sectoral collaboration and the active participation of local stakeholders. Coordinated efforts between government agencies, non-governmental organizations (NGOs), community leaders, and health workers have been shown to enhance program delivery and ensure cultural sensitivity in health messaging (Okoli *et al.*, 2025). These partnerships can bridge the gap between policy and practice, facilitating interventions that are both context-specific and sustainable.

Public health interventions for controlling and preventing infectious diseases in selected Local Government Areas of Taraba State focus on key variables such as awareness, access, infrastructure, and behavior. Health education campaigns improve awareness about hygiene and disease transmission. Access to vaccines, insecticide-treated nets, and antiretroviral therapy enhances prevention. Improved water, sanitation, and healthcare infrastructure reduces exposure and supports early treatment. Community engagement influences behavioral change and compliance with health guidelines. These interventions target diseases like malaria, tuberculosis, and HIV/AIDS, addressing socio-economic disparities and cultural practices that affect health outcomes. Success depends on sustained funding, government support, and community participation.

Given these dynamics, it becomes imperative to evaluate not only the outcomes of existing public health interventions in rural Taraba State but also the contextual challenges that influence their implementation. By identifying which strategies are most effective and the barriers they face, this study aims to provide practical insights into improving public health delivery in underserved communities. Through this approach, the research will contribute to the development of more responsive, community-centered public health models that address the unique health challenges of rural populations in Nigeria. This study is aimed at investigating Public health interventions for control and prevention of infectious diseases in some selected Local Government Areas of Taraba State

Statement of the Problem

Public health interventions are vital in controlling and preventing infectious diseases in rural communities of Taraba State by promoting disease surveillance, immunization, sanitation, and health education. However, inadequate healthcare infrastructure, poor access to clean water, and limited awareness hinder their effectiveness. Many residents rely on traditional medicine, delaying timely medical intervention and exacerbating disease spread. Malaria, cholera, and tuberculosis remain prevalent due to poor sanitation and weak policy enforcement. Additionally,

community resistance to vaccination and misconceptions about disease transmission further undermine progress (Eze, Lawani, and Eze, 2024). Strengthening intervention strategies is essential for reducing infections and improving overall health outcomes (Ibrahim, Sule, and Yusuf, 2024).

Aim and Objectives of the Study

The aim of this study is to examine Public health interventions for control and prevention of infectious diseases in some selected Local Government Areas of Taraba State. The specific objectives are;

i. To examine the effectiveness of public health interventions in controlling infectious diseases in rural communities of Taraba State.
ii. To assess the challenges affecting the implementation of public health interventions in rural communities of Taraba State.

Research Questions

The study will provide answers to the following questions;

i. How effective are public health interventions in controlling infectious diseases in rural communities of Taraba State?

ii. What are the challenges affecting the implementation of public health interventions for disease prevention in rural communities of Taraba State?

Hypotheses

Ho_1: There is no significant effectiveness of public health interventions in controlling infectious diseases in rural communities of Taraba State.

Ho_2: There are no significant challenges affecting the implementation of public health interventions for disease prevention in rural communities of Taraba State.

Theoretical Framework

Health Belief Model (HBM)

This study is anchored on the Health Belief Model (HBM), developed by Rosenstock in 1966. The model explains health-related behavior by focusing on individuals' beliefs about health conditions, perceived threats, benefits of action, and barriers to action. Its strengths lie in its ability to predict health behaviors and guide health interventions. However, it has been criticized for overlooking environmental and social influences. The HBM is relevant to this study as it helps explain how perceptions of disease severity and intervention benefits influence rural

dwellers' participation in public health programs aimed at controlling and preventing infectious diseases in Taraba State.

Methodology

This study adopted a descriptive survey research design to examine public health interventions for infectious disease control and prevention. The research focused on healthcare workers, community health volunteers, and adult residents within Wukari, Gassol, and Jalingo Local Government Areas of Taraba State. These areas were selected based on their high disease burden and varying levels of public health intervention. The target population was estimated at 15,000 individuals aged 18 years and above, who had either direct or indirect experience with public health programs.

A sample of 400 respondents was drawn using a multi-stage sampling technique to ensure representativeness across the three selected LGAs. Data were collected through a structured questionnaire titled *Public Health Interventions for Control and Prevention of Infectious Diseases Research Questionnaire (PHICPIDRQ)*. The instrument was designed to capture both quantitative and qualitative data and consisted of four key sections. These included items on demographic information, awareness and exposure to public health interventions, perceived effectiveness, and implementation challenges. It featured both closed-ended questions—such as multiple-choice and Likert-scale items—and open-ended questions that allowed respondents to share their experiences and suggestions.

The questionnaire was validated by experts in public health to ensure content accuracy and clarity. A pilot test was conducted, and the instrument achieved a reliability coefficient (Cronbach's alpha) of 0.85, indicating high internal consistency. Data collection was carried out in person to encourage full participation and enhance the response rate.

For data analysis, both descriptive and inferential statistics were employed. Descriptive tools such as frequency tables, means, and standard deviations were used to summarize the data, while inferential tests—including chi-square and Pearson Product-Moment Correlation—were used to test the hypotheses at a 0.05 level of significance. This analytical approach helped determine the relationship between public health interventions, the challenges associated with their implementation, and their impact on infectious disease control in the selected LGAs.

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Findings and Discussions

Table 1: Effectiveness of public health interventions in controlling and preventing infectious diseases in rural communities of Taraba State

S/N	Items description	N	Mean	Std.	Remark
1	Public health interventions have significantly reduced the prevalence of malaria in rural communities.	400	3.5	1.1	HE
2	Vaccination programs have effectively prevented the outbreak of infectious diseases.	400	3.6	1.0	HE
3	Health education campaigns have increased awareness about disease prevention.	400	2.3	1.0	LE
4	Provision of clean water and sanitation has helped to control cholera outbreaks.	400	3.4	1.1	HE
5	Access to healthcare facilities has improved through public health interventions.	400	3.7	0.9	HE
6	Government and non-governmental organizations' efforts in disease prevention are effective.	400	3.8	1.2	HE
7	Community participation enhances the success of public health interventions.	400	2.2	1.0	LE
8	Training of healthcare workers has improved the management of infectious diseases.	400	3.5	1.1	HE
9	Public health policies and regulations are effectively enforced in rural communities.	400	3.3	1.0	HE
10	Free or subsidized medical services have encouraged disease prevention measures.	400	3.6	1.2	HE
	Grand Mean		3.29		

Source: Field Survey, 2025

Mean magnitude: $X \geq 2.5$ (HE, High Extent)

$X < 2.5$ (LE, Low Extent)

Table 1 presents a detailed assessment of the perceived effectiveness of various public health interventions aimed at controlling and preventing infectious diseases in rural communities across Taraba State. The overall grand mean score of 3.29 suggests that, on average, respondents view these interventions as highly effective. This score falls within the upper range of the Likert scale used in the study, indicating a strong level of agreement among participants regarding the success of these measures in reducing the burden of infectious diseases. Specifically, respondents acknowledged that initiatives such as routine vaccination programs**,** provision of clean and safe drinking water**,** and expanded access to primary healthcare services have made significant contributions to lowering the prevalence of diseases like malaria, tuberculosis, and Lassa fever. These interventions were consistently rated above the cut-off mean of 2.50, affirming their central role in improving public health outcomes in rural areas.

However, not all aspects of the interventions were rated positively. The table also reveals that health education campaigns and community participation in health programs received relatively lower mean scores. This indicates a notable shortfall in public engagement and awareness, which are critical components of a successful health intervention strategy. The lower ratings suggest that while infrastructure and medical services are improving, efforts to educate and actively involve community members in disease prevention remain insufficient. This imbalance points to a gap that could hinder the long-term sustainability and impact of public health interventions. Without adequate community involvement and understanding, even well-resourced health programs may struggle to achieve optimal results. Therefore, the findings emphasize the urgent need to strengthen health education initiatives and encourage more grassroots participation in public health planning and execution. Doing so would not only improve awareness and compliance but also ensure a more holistic and sustainable approach to infectious disease control in Taraba State's rural communities.

Table 2: Challenges affecting the implementation of public health interventions for disease prevention in these communities

S/N	Items Description	N	Mean	Std.	Remark
1	Inadequate funding limits the effectiveness of public health interventions.	400	3.4	1.0	HE
2	Lack of government commitment significantly affects intervention programs.	400	2.4	0.9	LE
3	Poor infrastructure hinders the delivery of healthcare services in rural areas.	400	3.2	1.1	HE
4	Insufficient healthcare personnel slows down intervention implementation.	400	3.3	1.0	HE
5	Community resistance to health programs reduces intervention success.	400	2.3	0.9	LE
6	Poor health education limits public awareness of disease prevention.	400	3.1	1.0	HE
7	Weak enforcement of health policies affects disease prevention efforts.	400	3.5	1.1	HE
8	Inaccessibility of healthcare facilities reduces the impact of interventions.	400	3.0	0.8	HE
9	Lack of essential medical supplies affects intervention programs.	400	2.2	0.9	LE
10	Poor coordination between government and stakeholders affects implementation.	400	3.4	1.0	HE
	Grand Mean		**3.08**		

Source: Field Survey, 2025

Mean magnitude: $X \geq 2.5$ (HE, High Extent)

$X < 2.5$ (LE, Low Extent)

Table 2 presents respondents' views on the major challenges hindering the effective implementation of public health interventions aimed at preventing infectious diseases in rural communities of Taraba State. The overall grand mean score of 3.08 suggests a relatively high level of concern among respondents regarding the existence and impact of these challenges. This score indicates that the identified issues are not only prevalent but are also seen as significantly affecting the success of public health efforts in these underserved areas.

Among the most highly rated challenges were inadequate funding**,** poor infrastructure**, and** weak enforcement of health-related policies**.** These factors recorded mean scores well above the standard decision benchmark of 2.50, demonstrating that respondents overwhelmingly perceive them as critical obstacles. Inadequate funding limits the availability of essential resources such as medical personnel, equipment, and outreach logistics, while poor infrastructure—such as bad roads, limited healthcare facilities, and unreliable power supply—hampers access to remote areas. Furthermore, weak policy enforcement undermines the consistency and reliability of health interventions, reducing their potential impact over time.

On the other hand, certain factors were rated comparatively lower. These include lack of government commitment**,** community resistance to interventions**,** and the limited availability of medical supplies**.** Although these issues were acknowledged, their lower mean scores suggest that respondents view them as less pressing or less directly responsible for the limitations experienced in the delivery of public health interventions. It is possible that while these challenges exist, they may be perceived as either episodic, manageable, or secondary to the more pressing structural issues.

The pattern of responses highlights a crucial insight: for public health interventions to be more effective and sustainable in rural communities, structural and systemic constraints must be urgently addressed**.** This includes prioritizing financial investment in healthcare delivery, upgrading rural infrastructure, and ensuring that health policies are not only well-designed but actively implemented and monitored. By tackling these core barriers, policymakers and stakeholders can significantly improve the reach, quality, and effectiveness of public health initiatives, ultimately leading to better health outcomes for rural populations.

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Hypotheses Testing

Hypothesis 1:

Ho_1: There is no significant effectiveness of public health interventions in controlling and preventing infectious diseases in rural communities of Taraba State.

Table 3: The Extent to Which Public Health Interventions Predict Infectious Disease Control

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig. (p-value)
	B	Std. Error	Beta	
1	(Constant)	12.250	4.200	2.917
	Public health interventions	0.682	0.115	0.715

a. **Dependent Variable:** Infectious Disease Control

Table 3 shows that public health interventions significantly predict infectious disease control. The unstandardized coefficient (B = 0.682) indicates that a one-unit increase in public health interventions leads to a 0.682 unit increase in disease control. The standardized beta (0.715) reflects a strong positive relationship. The t-value (5.930) is high, and the p-value (0.000) is well below the 0.05 threshold, confirming statistical significance. The constant (12.250) represents the baseline level of disease control without interventions, and the standard error (4.200) suggests moderate variability. Overall, the findings indicate that public health interventions have a strong and significant impact on disease control.

Hypothesis 2:

Ho_2: There are no significant challenges affecting the implementation of public health interventions for disease prevention in rural communities of Taraba State

Table 4: Chi-square test showing the relationship between challenges affecting the implementation of public health interventions and disease prevention in rural communities of Taraba State

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	12.756	2	0.002
Likelihood Ratio	13.004	2	0.001
Linear-by-Linear Association	11.432	1	0.001
N of valid cases	400		

Table 4 presents a Chi-square analysis of the relationship between challenges in implementing public health interventions and disease prevention in rural Taraba State. The Pearson Chi-square value (12.756, p = 0.002) and the Likelihood Ratio (13.004, p = 0.001) indicate a statistically significant relationship. Additionally, the Linear-by-Linear Association (11.432, p = 0.001) shows a strong directional link between the variables. With 400 valid cases, the findings suggest that challenges such as inadequate funding, poor infrastructure, and limited manpower significantly affect the effectiveness of disease prevention efforts. These results emphasize the need to address implementation barriers to improve public health outcomes.

Discussions of Findings

In line with the Health Belief Model, the study revealed that public health interventions in rural Taraba State are seen as beneficial, particularly in improving vaccination and healthcare access, indicating strong perceived benefits. However, challenges such as inadequate funding, poor infrastructure, and weak policy enforcement represent major *perceived barriers*. The low levels of health education and limited community involvement suggest a lack of *cues to action* and weak perceived susceptibility to diseases. These findings underscore the importance of improving public awareness, strengthening structural support, and encouraging individual and collective responsibility for health-related behaviors.

Eze and Okonkwo (2021) emphasized that public health systems in rural Nigeria are weakened by implementation challenges such as inadequate infrastructure, poor logistics, and underfunded health programs. The findings of this study align with their assertion, revealing a significant relationship between these challenges and disease prevention efforts in Taraba State's rural communities. The results suggest that addressing these barriers is essential to improve public health outcomes and ensure that interventions achieve their intended impact in underserved areas.

Ibrahim and Musa (2022) argued that the success of disease prevention in rural Nigeria depends largely on eliminating barriers such as shortage of skilled personnel, lack of community engagement, and inconsistent health policies. This study supports their claim by showing that challenges in the implementation of public health interventions significantly affect disease control in Taraba State. The implication is clear: overcoming these challenges through policy reform and strategic investment is crucial for effective rural health delivery.

Conclusion

This study concludes that the challenges limiting the implementation of public health interventions significantly undermine efforts to prevent infectious diseases in rural communities of Taraba State. Despite the effectiveness of key strategies such as vaccination and improved healthcare access, issues like inadequate infrastructure, limited medical resources, and poor execution of health policies continue to hinder overall impact. These obstacles weaken the reach,

sustainability, and acceptance of public health programs, making disease control less effective. Addressing these structural and systemic barriers through increased funding, strengthened infrastructure, better policy enforcement, and enhanced community engagement is essential to improving public health outcomes in underserved areas.

Recommendations

In line with the findings, the following are hereby recommended:

1. Government and health agencies should strengthen infrastructure and increase funding to support effective implementation of public health interventions in rural areas.
2. Capacity building and community engagement strategies should be prioritized to overcome challenges and improve disease prevention outcomes in Taraba State.

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