



# **GLOBAL FOCUS**

## **INTERDISCIPLINARY**

### **JOURNAL OF**

#### **HEALTH AND SCIENCES**

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# EPIDEMIOLOGICAL ASSESSMENT OF CHILDHOOD IMMUNIZATION COVERAGE AND ITS DETERMINANTS IN UGHELLI SOUTH LOCAL GOVERNMENT AREA, DELTA STATE.

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Article history: Acceptance Date June 20th 2025  
And Published Date 28th June 2025

## ABSTRACT

**BACKGROUND:** to control the spread of disease in a society Childhood immunisation is fundamental. The low level of immunization uptake among children 0-5years highlights the need to investigate parents awareness, perception and practice about childhood immunization. This study evaluates parents' awareness, perception, and practice of childhood immunization in Ughelli South, Delta State.

**METHOD:** A cross-sectional survey was conducted among 420 randomly selected households with children 0-5yrs in Ughelli South Local Government Area of Delta State. Data were collected from parents through a validated and reliable structured questionnaire, which assessed various factors related to parents awareness, perception and practice on childhood immunization. Descriptive statistics of mean, frequency and percentages were used to analyze the demographic, awareness, perception and practice data. Inferential statistics of The collected data were analyzed utilizing both descriptive and inferential statistical methods to determine immunization coverage and identify associated determinants.

**RESULTS:** This study indicated that majority of the respondents were females (371; 88.3%), a 25–34 years (44.8%), possess SSCE certificate (156; 37.1%), and Traders (140; 33.3%). Findings also indicated that Among the respondents, the majority of those aware of recommended immunization hold SSCE qualifications (118), A smaller proportion of awareness is observed among those with no education (24) and FLSC (20). Conversely, lack of awareness ("No" and "Don't know") is more prominent in lower educational groups. The chi-square statistic ( $\chi^2=14.884$ ) with 10 degrees of freedom and a P-value of 0.0136 indicates a statistically significant association between educational qualification and immunization awareness, suggesting that higher education levels are positively correlated with greater awareness. Furthermore, majority of respondents who consider child immunization "very important", strongly agree (287) or agree (105) with the effectiveness of vaccines. The Chi-square test result ( $\chi^2 = 21.863$ ,  $df = 4$ ,  $p < 0.0001$ ) indicates a highly significant association between the importance of child immunization and belief in vaccine effectiveness, highlighting a strong alignment between the perceived value of immunization and confidence in its preventive efficacy.



**CONCLUSION:** This study reveals that majority of parents in Ughelli South local government area have awareness of childhood immunization. It also reveals that there is significant association between educational qualification and immunization awareness, suggesting that higher education levels are positively correlated with greater awareness. So therefore, educating parents and the community about the facts and myths surrounding vaccination through healthcare professionals could substantially enhance societal awareness, perception, and vaccination practices.

**KEYWORDS:** Childhood immunization, Awareness, Perception. Practices, Ughelli South, Delta State, Local government area, Primary health center, Vaccination, Immunization coverage, Parental knowledge

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## INTRODUCTION

Childhood immunization stands is a landmark public health achievement of the 20<sup>th</sup> century, significantly contributing to the control and prevention of infectious diseases. The impact of immunization programs has been remarkable, leading to the global eradication of smallpox and substantial declines in the incidence of diseases like polio, measles, and diphtheria (WHO, 2022). Vaccines contain attenuated or inactivated microorganisms, such as bacteria, viruses, or fungi, that stimulate the immune system to produce a targeted response. This immunological response enables the body to recognize and combat specific pathogens upon future exposure, conferring long-term immunity against severe and potentially life-threatening diseases (The Lancet, 2020). The primary objective of childhood vaccination strategies is to achieve high immunity levels within the population, thereby preventing the transmission of severe childhood diseases through comprehensive immunization coverage (WHO, 2020).

Enhancing well-child visits and immunization rates is essential for safeguarding the health and well-being of young populations. By adopting evidence-based strategies, healthcare providers can optimize preventive care, mitigate the risk of disease outbreaks, and foster healthy growth and development. This underscores the critical role of well-child visits and

immunizations in maintaining robust public health (Centers for Disease Control and Prevention, 2022). Vaccine-preventable diseases can be highly contagious and pose significant risks to babies and young children, who are particularly vulnerable to infection due to their underdeveloped immune systems. Timely vaccination is essential for protecting their health and well-being (American Academy of Allergy, Asthma, and Immunology, 2021).

Despite the effectiveness of vaccines, global immunization coverage remains uneven, with significant gaps in many regions (WHO, 2020). The World Health Organization (WHO) reports a significant concern, with approximately 146 million infants and children worldwide remaining unvaccinated. The majority of these unvaccinated individuals are concentrated in ten countries, including Nigeria, highlighting the need for targeted efforts to improve vaccine access and coverage in these areas (WHO, 2020).

Nigeria has experienced a worrying decline in vaccination coverage in recent years, compromising the country's ability to control vaccine-preventable diseases. The proportion of children receiving the third dose of the pentavalent vaccine (Penta 3/DPT3), a key indicator of routine immunization performance, dropped significantly from 52% in 2014 to 33% in 2016, falling far short of the WHO-recommended target of 90% (Global



Alliance for Vaccines and Immunization, 2020). In 2019, 19.7 million infants worldwide missed out on essential routine immunization services, with 60% of these unprotected children residing in ten countries, including Nigeria (WHO, 2020). Nigeria has made notable progress in vaccination coverage over the past decade, according to the 2018 National Demographic and Health Survey. The proportion of children aged 12-23 months who received all basic vaccinations increased significantly from 23% in 2008 to 31% in 2018. Additionally, the percentage of children who did not receive any basic vaccinations decreased from 29% to 19% during the same period. While this trend indicates improvement in childhood vaccination coverage, it still falls short of the Sustainable Development Goal 3 target of achieving over 90% coverage. The vaccination coverage varies widely across states, with Anambra leading at 76% and Sokoto lagging behind at 5%, while Ebonyi State's coverage ranges between 34-48% (National Population Commission, 2019).

When it comes to childhood immunization, parents' awareness, perception and practice play an important role. However, there is a dearth of information on the specific awareness, perception and practice of parents regarding childhood immunization in Ughelli South local government area. This knowledge gap hinders the development of effective strategies to improve vaccination rates and prevent Vaccine preventable diseases.

**CONCEPTUAL FRAMEWORK:** The Conceptual framework of this study has two primary concepts that grounds the study which are "awareness and perception" and "practices related to childhood immunization." These core ideas allow us to understand the underlying themes that shape how parents

engage with immunization in the Ughelli South Local Government Area.

**THEORETICAL FRAMEWORK;** This study draws on two key theories: the Health Belief Model (HBM) (Glanz et al., 2021) and the Theory of Planned Behavior (TPB) (Ajzen, 2020). These theories provide insight into how parents' beliefs, attitudes, social influences, and perceived barriers shape their actions concerning childhood immunization.

## METHODS

**STUDY AREA:** Ughelli South Local Government Area (LGA), situated in the western part of Delta State, Nigeria, serves as the focal point for this research. Created in 1996, Ughelli South LGA is one of the 25 LGAs in Delta State (according to Delta state government, 1996). Geographically, it is bounded by; Ughelli North LGA to the north, Isoko North LGA to the east, Patani LGA to the south, Udu LGA to the west. With its headquarters in Otu-Jeremi, Ughelli South LGA is characterized as a rural area, with a population comprising predominantly rural dwellers engaged in agriculture, fishing, and small-scale trading (National Population Commission, 2020). The LGA covers a total area of approximately 786 square kilometers, with a diverse terrain featuring swampy and upland regions (Federal Republic of Nigeria, 2020).

**STUDY DESIGN:** A cross-sectional descriptive survey was adopted and carried out in Ughelli South local government area of Delta state for this study. This is appropriate because it allows for the collection of data from a large population at one point in time, focusing on awareness, perceptions, and practices of parents who have children between the ages of 0-5years. Questionnaire were designed in English and was translated in pidgin for those that don't understand English, and data were collected between





December 2025 and January 2025. The data were analyzed using SPSS (Stand for statistical product and service solutions) version 24.

**STUDY POPULATION:** The population of Ughelli South LGA is approximately 213,576 people (NPC, 2020). The inhabitants are predominantly, Urhobo ethnic group (60%), Isoko ethnic group (30%) and Other ethnic groups (10%) (according to Urhobo historical society, 2020).

### SAMPLE SIZE CALCULATION

A sample size of 422 respondents was obtained using the Cochran's formula. The sample size estimation formula from the projected 213,576 people (NPC, 2020).

$$n_0 = \frac{Z^2 \cdot P \cdot (1 - p)}{e^2}$$

$e^2$

$n_0$  = minimum sample size,  $Z$  = Z-value (the number of standard deviations corresponding to the desired confidence level, e.g., 1.96 for 95% confidence),  $p$  = estimated proportion of the population (if unknown, 0.5 is often used as it maximizes the sample size),  $e$  = margin of error (desired level of precision) (Singh & Masuku, 2021).

$$z = 1.96, p = 0.5, e = 0.05$$

$$n_0 = \frac{(1.96)^2 \cdot 0.5 \cdot (1 - 0.5)}{(0.05)^2}$$

$$n_0 = \frac{(3.8416) \cdot 0.5 \cdot 0.5}{0.0025}$$

$$n_0 = \frac{(3.8416) \cdot 0.5 \cdot (1 - 0.5)}{0.0025}$$

$$n_0 = \frac{0.9604}{0.0025}$$

$$n_0 = 384.16$$

Since population of 213,576 is finite, applying the finite population correction formula:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

$N$  = population size (213,576),  $n$  = calculated sample size for large population (384)

$$n = \frac{384}{1 + \frac{384 - 1}{213,576}}$$

$$n = \frac{384}{1 + 0.0018}$$

$$n = \frac{384}{\frac{383}{213,576}}$$

$$n = \frac{384}{1 + 1.0018}$$

$$n = \frac{384}{1.0018}$$

$$n = 383.31$$

10% non-response rate:  $10/100 \times 384 = 38.4 = 38$

Therefore, the final sample size is  $384 + 38 = 422$  participants.

**Inclusion criteria:** Study participants were parents/caregivers who have a child aged 0-5 years, reside in Ughelli South local government area, and parents willing to participate in the study

**Exclusion criteria:** Individuals excluded were parents/ caregivers who are not residents of Ughelli South local government area, who do not have a child aged 0-5 years, parents who are not willing to participate in the study, and parents with communication barriers, such as severe cognitive or mental health conditions, that would prevent effective participation in the study (Creswell & Creswell, 2023).

**Sampling Technique:** A simple random sampling technique was adopted to select the four hundred and twenty (420) respondents that constituted the sample for the study.



## STUDY INSTRUMENTS

The primary instrument was a structured questionnaire divided into three sections and the statistical analysis that was used is Ordinal coding: Awareness: Questions assessing parents' knowledge about childhood immunization. Perception: Likert scale items exploring parents' views on the benefits, risks and necessity of immunization. Practice: Questions related to the immunization practices of parents (e.g., adherence to schedules, missed vaccinations). The questionnaire comprises two parts. Part 1: The socio-demographic characteristics of the parents, and Part 2: Data on parents' Awareness, perception and practice of parents towards childhood immunization. The parents' awareness was explored with a structured questionnaire of questions, on a three-point Likert scale, ranging from "I do not know" or "No", and "Yes". For the purpose of analysis, parents who answered "No" or "I do not know" were considered an indicator of lack of awareness, and were combined and coded with a "0" score, and "Yes" answers were coded with a score of "1". A five-point Likert scale ("Strongly Agree", "Agree", "Not Sure", "Disagree", and "Strongly Disagree") were used to assess parents' perception towards childhood immunization. Strongly agree was coded (5), Agree (4), Disagree (3), Strongly disagree (2), and not sure (1). For the purpose of analysis, the "Strongly Agree" and "Agree" were combined and "Disagree" and "Strongly Disagree" were combined and "Not Sure" will stand alone. If the statement was correct, Strongly Agree and Agree were used to identify the percentage of people who have the awareness of immunization. For wrong statements, Disagree and Strongly Disagree were combined for lack of awareness. At the end, mean analysis was used to make a decision. The total score of awareness, perception and practice were ranged. The threshold median score for the questionnaire was considered 2 for

awareness, 3 for perception and 2 for practice of immunization. A score of  $\geq 2$  was considered good awareness,  $\geq 3$  was considered a positive perception, and  $\geq 2$  for good practice, respectively.

Reliability of study instruments was tested using Cronbach's alpha to measure internal consistency. A reliability coefficient of 0.7 or above was considered acceptable. The pilot study data was also used to test the reliability of the instrument. Test-retest reliability of study questionnaires was determined.

## DATA ANALYSIS

A total of 420 questionnaires were retrieved, representing a response rate of approximately 99.5% of the initial target of 422. Descriptive Statistics was used to summarize and measure the data collected from the questionnaire such as mean, and frequencies. In Inferential Statistics, Chi-square test was used to examine relationships and differences between variables. This was done to determine whether there is a significant association between parents' educational level and their awareness of childhood immunization. Furthermore, logistic regression was applied to assess the effect of various predictors, such as socioeconomic status, on the likelihood of parents vaccinating their children. SPSS version 24 was used to analyze all data including chi-square analysis of variables. Percentage was useful for summarizing and describing the frequency of responses or the distribution of categorical data.

## ETHICAL CONSIDERATION

Ethical approval and clearance certificate was obtained from the Ethics and Research Committee of the Ministry of Health Delta state hospitals management board. Participants were provided with the details of the study like the purpose of the evaluation and voluntary nature of



participation. Only those who provided verbal consent were recruited in the study. Confidentiality of participants were upheld to ensure that information shared did not passed on to third parties without their

consent. Privacy of all participants were ensured. Data collected were anonymous.

## RESULTS

### Socio-demographic characteristics of Ughelli South parents

Table 1 presents the gender distribution of respondents, revealing a significant disparity between male and female participants. Out of a total of 420 respondents, 49 (11.7%) are male, while 371 (88.3%) are female. This indicates that females constitute the overwhelming majority of the study's respondents. The cumulative percentage confirms that 100% of the respondents are accounted for, highlighting a gender imbalance in the sample population.

#### 4.1 Demographic characteristics of Respondents

Table 4.1 below indicates that majority of the respondents were females (371; 88.3%), 25-34 years (188; 44.8%), possess SSCE (156; 37.1%), traders (140; 33.3%).

**Table 4.1: Socio-demographic characteristics of Ughelli South parents**

	Demographic	Frequency	Percent
Gender	Male	49	11.7
	Female	371	88.3
	<b>Total</b>	<b>420</b>	<b>100</b>
Age	15-24 years	57	13.6
	25-34 years	188	44.8
	35-44 years	138	32.9
	45-54 years	37	8.8
	<b>Total</b>	<b>420</b>	<b>100</b>
Educational	No education	42	10
	FLSC	21	5
	SSCE	156	37.1
	OND	98	23.3
	HND	49	11.7
	BSC/BA	54	12.9
	<b>Total</b>	<b>420</b>	<b>100</b>
Occupation	Trader	140	33.3
	Business	70	16.7
	Engineer	70	16.7
	Hair dresser	47	11.2
	Teacher	47	11.2



Others	46	11
<b>Total</b>	<b>420</b>	<b>100</b>

## 4.2 Awareness about childhood immunization

Table 2 below shows parental awareness about childhood immunization. The majority of parents, 413 (98.3%) have heard of childhood immunization and 287 (68.3%), were aware of the recommended immunization schedule for children in Nigeria, of which 294 (70%) got information about childhood immunization from the hospital and health center.

Awareness items	Yes	No	N/A
Have you heard of childhood immunization?	413 (98.3%)	0	7 (1.7%)
Are you aware of the recommended immunization schedule for children in Nigeria?	287 (68.3%)	126 (30%)	7 (1.7%)
<b>Where did you get information about childhood immunization</b>	<b>n (%)</b>		
Health worker	49 (11.7)		
Hospital/Health clinic	294 (70)		
School	21 (5)		
Family/Friends	42 (10)		
N/A	14 (3.3)		

## Table 4.3 Perception on childhood immunization

Table 3 below shows the parental perception about childhood immunization. The vast majority of the parents, 399 (95%) think that childhood immunization is very important and 413 (98.3%), either strongly agreed or agreed that childhood immunization is effective in preventing diseases, while 238 (56.7%) of parents revealed that they are either very concerned or concerned about the safety of vaccines for their children. About 350 (83.3%) of parents think that vaccines should be made mandatory for all children. On the other hand, 378 (90%) of parents attest to the fact that their children have never had side effects after vaccination and 413 (98.3%) of the parents have not recorded childhood mortality due to vaccination. Meanwhile majority of the respondent 364 (86.7%) have not experienced challenges in accessing immunization services.

Perception items	Yes	No	N/A
Do you think that vaccines should be mandatory for all children?	350 (83.3%)	63 (15%)	7 (1.7%)
Have any of your children experienced side effects after vaccination?	35 (8.3%)	378 (90%)	7 (1.7%)
Have you or anyone around you recorded childhood mortality due to vaccination?	2 (0.5%)	413 (98.3%)	5 (1.2%)
Have you experienced any challenges in accessing immunization services?	35 (8.3%)	364 (86.7)	21 (5%)



**Do you agree that vaccines**

are effective in preventing diseases?	413 (98.3%)	0(0%)	7 (1.7%)
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Are you concerned about the safety of Vaccines?	238 (56.7%)	182 (43.3%)	0(0%)
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Do you think childhood immunization is very important?	399 (95%)	7 (1.7%)	14 (3.3%)
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**4.4 Practices on childhood immunization**

Table 7 shows parental practices on childhood immunization. This reveals that a larger number of parents 378 (90%) have had all their children vaccinated according to the recommended schedule and have never missed vaccination appointment. Meanwhile significant number of parents 91 (21.7%) and 98 (23.3%) respectively could remember and mention 3 or 4 type of the vaccines that their children have received. On the other hand, only 49 (11.7%) of the parents could remember and mention all the vaccines that their children have received.

Practice items	Yes n (n%)	No n (n%)	N/A n (n%)
Have you had all your children vaccinated according to the recommended schedule?	378 (90)	42 (10)	0(0)
Have you ever missed a vaccination appointment for your child?	35 (8.3)	378 (90)	7 (1.7)
<b>Which vaccines have your children received that you can remember?</b>	<b>n (n%)</b>		
BCG	21 (5)		
BCG, OPV	21 (5)		
BCG, OPV, Pentavalent	91 (21.7)		
BCG, OPV, Pentavalent, PCV	98 (23.3)		
BCG, OPV, Pentavalent, PCV, Measles	56 (13.3)		
BCG, OPV, Pentavalent, PCV, Measles, Deworming	21 (5)		
BCG, OPV, Pentavalent, PCV, Rota 1&2, Measles, Vitamin A 1&2	14 (3.3)		
BCG, OPV, PCV, Pentavalent, Measles, Rota 1&2, Yellow fever, vitamin A 1&2	14 (3.3)		
All vaccines	49 (11.7)		
N/A	35 (8.3)		



## DISCUSSIONS

A total of 420 questionnaires were retrieved, representing a response rate of approximately 99.5% of the initial target of 422. This study investigated parents' awareness, perception, and practices regarding childhood immunization in Ughelli South Local Government Area. The primary objective of this research was to evaluate the level of awareness among parents about childhood immunization and its benefits. Awareness, in this context, encompasses the extent to which parents are informed about childhood immunization, including its purpose, benefits, schedules, and potential side effects. Essentially, it pertains to parents' knowledge base regarding vaccination. Existing literature emphasizes the significance of parents' awareness, as it influences adherence to vaccination schedules and the likelihood of seeking additional information (Abdulraheem et al., 2021). The findings of this study reveal that majority of parents (98.3%) are aware and have heard of childhood immunization and (68.3%), were aware of the recommended immunization schedule for children in Nigeria. An interview with a health worker revealed that majority of parents are well-informed about childhood immunization, largely due to the awareness they receive during antenatal clinics at the PHC. Parents tend to rely heavily on the information provided to them by healthcare professionals at the health center. This aligns with a study published in the Journal of Community Medicine and Primary Health Care in 2019 found that mothers in Kano State, Nigeria, had a moderate level of awareness about childhood immunization (Abdullahi et al., 2019). Another study published in the Journal of Health Education Research & Development in 2021 reviewed the awareness and perception of childhood immunization among parents in Nigeria (Abdulraheem et al., 2021). Likewise, a

study published in the Pan African Medical Journal in 2021 found that mothers in Osun State, Nigeria, had a moderate level of awareness about childhood immunization. The study revealed that 76.1% of mothers had good knowledge of vaccine-preventable diseases and routine immunization (Abdullahi et al., 2019).

This study investigated parents' perceptions of childhood immunization, encompassing their beliefs, attitudes, and concerns. These deeply held beliefs can significantly influence parents' choices regarding vaccination (Ibrahim et al., 2022). Notably, the majority of parents (399, 95%) consider childhood immunization to be very important. Furthermore, 413 parents (98.3%) either strongly agreed or agreed that childhood immunization is effective in preventing diseases. However, concerns about vaccine safety were also prevalent, with 238 parents (56.7%) expressing either strong concern or concern about the safety of vaccines for their children. Parents' perception of childhood immunization plays a crucial role in determining whether their children receive timely vaccinations. A study published in the Journal of Health Education Research & Development in 2021 identified factors such as education level, socioeconomic status, and access to healthcare as influencing parents' perception of childhood immunization (Adeyinka et al., 2022).

This study also investigated the practices of parents regarding childhood immunization, including their Vaccination decisions and behaviors. Looking at parental practice on childhood immunization, this study reveals that a larger number of parents 378 (90%) have had all their children vaccinated according to the recommended schedule and have never missed vaccination appointment. Meanwhile significant number of parents



98 (23.3%) and 91 (21.7%) respectively have had their children vaccinated with about 4 or 5 type of the vaccines. The majority of respondents who consider child immunization "very important" strongly agree (287) or agree (105) with the effectiveness of vaccines, with very few disagreeing (7). Among those who find immunization "somewhat important," responses are evenly split between strong agreement (7) and agreement (7), while those who view it as "not very important" all agree (7) with no strong disagreement. The Chi-square test result ( $\chi^2 = 21.863$ ,  $df = 4$ ,  $p < 0.0001$ ) indicates a highly significant association between the importance of child immunization and belief in vaccine effectiveness, highlighting a strong alignment between the perceived value of immunization and confidence in its preventive efficacy. A current study's findings align with this study which revealed that a significant majority of parents (82.5%) supported child immunization and recognized the role of vaccines in disease prevention (Kaur et al., 2022). Several evidence-based recommendations can be considered through improving awareness and education by implementing community-based education programs to increase awareness about the benefits and importance of vaccination. Engaging with local influencers and community leaders to promote vaccination and address misconceptions.

## CONCLUSION

This study reveals that the majority of parents in Ughelli South local government area have awareness of childhood immunization. It also reveals that there is significant association between educational qualification and immunization awareness, suggesting that higher education levels are positively correlated with greater awareness.

## STRENGTH OF THE STUDY

This study's findings can inform the development of targeted interventions, education programs, and policies to improve childhood immunization rates in the area. Also, focusing on Ughelli South LGA of Delta state will allow for a targeted and in-depth examination of the issues, making the findings more relevant and applicable to the local context. Additionally, the study can contribute to the existing body of knowledge on childhood immunization, particularly in Nigeria, and provide insights into the cultural, social, and economic factors influencing parents' decisions.

## LIMITATION OF THE STUDY

This study is limited to Ughelli South LGA of Delta state, which may not be representative of other areas in Nigeria. This study is limited by the sampling method used, which may not ensure a representative sample of all parents in the study area. This study is limited by time constraints, which may not allow for an exhaustive examination of the research topic.

## RECOMMENDATIONS

1. Develop and Implement Effective Communication Strategies: Healthcare providers should educate parents more on the benefits and risks of immunization, addressing their concerns and misconceptions and learn to talk to parents politely and with respect.
2. Strengthen Immunization Services: Government should ensure that immunization services are accessible, affordable, and of high quality, with adequate vaccine supply and employ more trained healthcare workers.
3. Establish Community-Based Outreach Programs: Government should implement



outreach programs to reach remote or hard-to-reach areas, ensuring that all children have access to immunization services.

4. Awareness: Government should ensure that more awareness are carried out through TV, radio, social media etc. They should also implement more ways to give reminders to parents for their next

immunization visits, such as sending emails and text messages.

**ACKNOWLEDGE:** The authors express gratitude to the residents of Ughelli South LGA of Delta State for their cooperation and data provision during the study period.

**CONFLICT OF INTEREST:** There is no conflict of interest.

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We support Gender Equality (SDG 5) by encouraging inclusive authorship and research on women's health and gender dynamics. Recognizing the link between environment and health, we welcome work on Clean Water, Sanitation, and Climate-Related Health (SDGs 6 & 13). Our journal highlights innovations that enhance Health Infrastructure (SDG 9) and champions efforts to Reduce Health Inequalities (SDG 10). By promoting Global Partnerships (SDG 17) and publishing collaborative, policy-relevant research, we contribute to sustainable development. Finally, we support research that strengthens Urban Health and Safe Communities (SDGs 11 & 16), helping to build healthier, more resilient societies.

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Print ISSN:  
Online ISSN: