Journal of Public Health and Diseases
Volume 8(1), pages 24-30, April 2026
Article Number: 34DC31623
ISSN: 2705-2214
https://doi.org/10.31248/JPHD2026.184
https://integrityresjournals.org/journal/JPHD

Full Length Research

Assessment of factors contributing to immunisation services utilisation among mothers in Bayelsa West, Nigeria

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Received Date: 17 March 2026 | Accepted Date: 30 March 2026 | Published Date: 30 April 2026

ABSTRACT: This study investigated some factors contributing to immunisation services utilisation among mothers in Bayelsa West. The study adopted a descriptive cross-sectional approach to select the respondents. A structured questionnaire was used as an instrument for data collection from the breastfeeding mothers. The research questions were tested using means, standard deviations, and ANOVA at 0.05 significance. Findings from this study show that most religions do not accept immunisation programs (SA- 215) compared to mothers who strongly disagreed (SD-187) with a mean score of 2.54. Approval from the fathers before mothers were allowed to immunise their children was observed as a custom in the study area, as 218 mothers strongly agreed that immunisation helps to prevent childhood killer diseases. Furthermore, a grand mean value of 3.27, exceeding the decision mean of 2.50, factors such as communal conflict, mothers' knowledge level (2.81), and fear of side effects (2.80), among others, were identified as influencing the utilisation of immunisation services among mothers in Bayelsa West. Observation from this study suggests that to a great extent, communal conflict constitutes a determinant of immunisation services utilisation among mothers. Awareness campaigns should be encouraged by the government to promote mothers' sensitisation on routine immunisation utilisation.

Keywords: Children, immunisation, mothers, vaccine.

INTRODUCTION

The acceptable criteria for vaccination coverage are the proportion of children who receive the pre-requisite doses of vaccine according to age to acquire the needed immunity for maximum protection against vaccine-preventable diseases in line with the immunisation schedule. Partial immunisation, missed opportunities and administration of vaccines beyond the prescribed minimum interval of doses are the results of the mothers 'engagement with other family activities to meet the economic demand of the family, and these are reasons for non-completeness rates irrespective of the cost-effective benefits of vaccination to prevent vaccine-preventable diseases (Eze *et al.* 2023).

The target for 2024 immunisation coverage for infants was 90%, which is the aim of the EPI, in order to provide herd immunity and reduce the prevalence of childhood immunisable diseases and protect individuals with waning immunity (Center for Disease Control and Prevention, 2023). However, Nigeria and Bayelsa in particular are making serious efforts to strengthen routine immunisation,

especially the efforts made by the State Emergency on Routine Immunisation Coordinating Centre to ensure that immunisation services are carried out in all settlements in every ward using the reaching every ward approach to change the poor outcome of immunisation activities in the country. In a study which was carried out by Nurnabi *et al.* (2018) on immunisation coverage, it showed a steady decline from 91% in 2005 to 89% in 2019. This shows that children under five are vulnerable to these vaccine-preventable diseases in our communities. Again, an immunisation coverage rate study carried out in the Southern part of Nigeria showed only 13% increase in 2003 and 23% in 2008. An official report from WHO(2018) also shows only 33% immunization coverage in Nigeria. Again, in 2022, it is estimated that approximately 14.3 million children did not receive any dose of DTP/PANTA (known as zero-dose children).

Despite the documented benefits of immunisation, the Nigerian National Programme on Immunisation (NPI) reportedly suffers recurrent setbacks due to ethnic and religious factors. This explains the persistent high burden of childhood communicable diseases as a result of a lack of herd immunity. One explanation for this trend has been the poor completeness and timeliness rates of immunisation activities; hence, Nigeria is among the 10 countries with the highest number of children that are incompletely immunised globally (Odikeme *et al.*, 2022). Also, lack of knowledge, poor attitude of health workers, proximity of health facilities to beneficiaries, etc., serve as determinants of immunisation uptake (Adedokun *et al.,* 2017).

However, the statistics show that there was a decrease of 3.8 million children compared to 2021. Recently, significant emphasis on reducing the overall number of zero-dose children was made, and this yielded positive results, particularly in terms of DTP/PENTA1 coverage. The percentage of children receiving DTP/PENTA3 is often used as a measure to determine how well a country is providing routine immunisation services and has a global target of 90 per cent as set by the Immunisation Agenda 2030. The above may not be unconnected to some underlying factors that the study intended to identify and investigate as outlined below (Adeloye *et al*., 2017). In Nigeria, the immunisation coverage rates are below 80%, with above 100/1000 under five mortality rates, and this calls for proactive measures to prevent the occurrence of any vaccine-preventable disease because, by implication, the under five children are vulnerable to any communicable diseases that could be prevented by vaccines (Abubakar *et al.,* 2021). Therefore, the objective of this study is to investigate some factors contributing to immunisation services utilisation among mothers in Bayelsa West.

MATERIALS AND METHODS

A descriptive cross-sectional design was employed, targeting a population of 80,000 mothers, from which a sample of 508 was selected. Data was collected using a structured questionnaire with a focus on factors influencing immunisation service utilisation. This research design has been successfully used by Adesina *et al.* (2023) and Abubakar *et al.* (2021) in a study on determinants of childhood immunisation among rural mothers in Nigeria and Africa. The instrument's validity was confirmed by experts in health studies, and reliability was established using the Pearson Product Moment Correlation, with a coefficient of 0.87. It was designed to elicit responses from respondents on a modified four-point Likert scale of “Strongly agree, Agree, Disagree and Strongly Disagree.

Sample and sampling technique

The sample size for this study was 508 mothers. The double population proportion formula was used to calculate the sample size of the participants. The study adopted a multi-stage sampling method.

Data collection

The respondents who were willing to answer questions were administered the questionnaire for data collection. The researchers administered the questionnaires face-to-face to the mothers residing in Adagbabiri, Sagbama, Tumgbabiri, Tumgbo, Anibeze, Kenan and Ofoni communities, and the questionnaires were collected immediately. The collection of the data was done two months.

Data analysis

Data analysis was performed using SPSS version 25.0. Descriptive statistics, reported as mean ± standard deviation, were systematically organized into tables. Participant responses were assessed using a four-point Likert scale, and the findings were interpreted to derive informed conclusions.

RESULTS

Table 1 shows the mean responses of the extent to which religious affiliation constitutes a determinant of immunisation services utilisation among mothers in Bayelsa West. The table reveals mean responses of items 21-25 as 2.54, 2.41, 2.41, 2.44, and 2.31, respectively. It is obvious from the table that it is only item 25 that is above the decision mean score of 2.50, while for items 22 – 25, the mean values were less than the decision mean score. This implies that the respondents agreed that some religions do not allow immunisation programmes, while they disagreed that, according to their religion, unvaccinated children can infect babies who are too young

Table 1. Mean responses of the extent to which religious affiliation constitutes a determinant of immunisation services utilisation among breastfeeding mothers.

S/N	Religious affiliation	SA	A	D	SD	Mean	Std. D	Decision
21	Some religions do not allow immunisation programmes	215	29	77	187	2.54	1.35	High Extent
22	According to my religion, unvaccinated children can infect babies who are too young to be fully immunised	205	27	45	231	2.41	1.40	Low Extent
23	In our religion, we believe that immunisation is an initiation from the devil because it is made compulsory	190	39	68	211	2.41	1.35	Low Extent
24	We do not allow immunised children to attend church services in my religion	223	23	19	243	2.44	1.44	Low Extent
25	It is our doctrine not to allow immunised children to attend church services	191	25	43	249	2.31	1.40	Low Extent
	Grand mean					2.42	1.29	Low Extent

Table 2. Mean responses of the extent to which spousal approval constitutes a determinant of immunisation services utilisation among mothers in Bayelsa West**.**

S/N	Spousal approval	SA	A	D	SD	Mean	Std. D	Decision
26	Spousal approval encourages wives to immunise their children	218	32	47	211	2.51	1.39	High Extent
27	Spousal support facilitates immunisation completion rate among children	209	35	60	204	2.49	1.37	Low Extent
28	Spousal approval gives confidence to mothers in the management of AEFI	191	31	26	260	2.30	1.41	Low Extent
29	Spousal support promotes the timely immunisation of children	211	55	55	187	2.57	1.35	High Extent
30	Spousal approval of immunisation helps to prevent childhood killer diseases	221	7	16	264	2.36	1.46	Low Extent
	Grand mean					**2.45**	**1.28**	**Low Extent**

to be fully immunised. The grand mean score obtained was 2.42, indicating that to a low extent, religious affiliation does not constitute a determinant of immunisation services utilisation among mothers.

Table 2 shows the mean responses of the extent to which spousal approval constitutes a determinant of immunisation services utilisation among mothers in Bayelsa West Senatorial District. The result shows that the mean value of items 26 and 29 is above the decision mean score of 2.50, while the mean value of items 27, 28 and 30 is less than the decision mean score. This means that the respondents agreed that spousal approval encourages wives to immunise their children and spousal support promotes the timely immunisation of children. In another development, the respondents disagreed that spousal support facilitates immunisation completion rate among children, spousal approval gives confidence to mothers on the management of AEFI, and spousal approval of immunisation helps to prevent childhood killer diseases. The grand mean score of 2.45 was found to be less than the decision mean of 2.50, meaning that to a low extent, spousal approval does not constitute a determinant of immunisation services utilisation among mothers.

Table 3 displays the mean responses of the extent to which communal conflict constitutes a determinant of immunisation services utilisation among mothers in Bayelsa West Senatorial District. It reveals that the mean responses of items 31-35 are 3.46, 3.18, 3.22, 3.20 and 3.28, respectively. These mean values were found to be above the decision mean value of 2.50. This portrays the respondents' agreement that war between communities affects immunisation services negatively, conflict prevents mothers from accessing health facilities for immunisation, war can lead to destruction of immunisation materials, communal conflict can increase the spread of vaccine-preventable diseases, and conflict can prevent health care providers from doing their work. The grand mean value was found to be 3.27, which is above the decision mean of 2.50, suggesting that, to a great extent, communal conflict constitutes a determinant of immunization services

Table 3. Mean responses of the extent to which communal conflict constitutes a determinant of immunisation services utilisation among mothers**.**

S/N	Communal conflict	SA	A	D	SD	Mean	Std. D	Decision
31	War between communities affects immunisation services negatively	285	171	52	0	3.46	0.67	High Extent
32	Conflict prevents mothers from accessing health facilities for immunisation	223	184	70	31	3.18	0.89	High Extent
33	War can lead to the destruction of immunisation materials	204	233	51	20	3.22	0.78	High Extent
34	Communal conflict can increase the spread of vaccine-preventable diseases	222	195	61	30	3.20	0.87	High Extent
35	Conflict can prevent a health care provider from doing their work	242	186	60	20	3.28	0.82	High Extent
	Grand mean					**3.27**	**0.44**	**High Extent**

Table 4. Mean responses of the extent to which phobia of side effects constitutes a determinant of immunisation services utilisation among mothers in Bayelsa West

S/N	Immunization phobia	SA	A	D	SD	Mean	Std. D	Decision
36	Fear of immunisation makes children vulnerable to vaccine-preventable diseases.	212	181	94	21	3.15	0.86	High Extent
37	Fear of AEFI has increased the non-compliance rate in immunisation.	192	233	63	20	3.18	0.79	High Extent
38	Fear of vaccine-preventable disease	214	103	131	60	2.93	1.07	High Extent
39	I am afraid because my children always develop high body temperature	194	109	64	150	2.67	1.25	High Extent
40	There is always the issue of convulsions with my child when immunised	182	104	124	98	2.73	1.14	High Extent
	Grand mean					**2.80**	**0.55**	**High Extent**

utilisation among mothers.

Table 4 shows the mean responses of the extent to which phobia of side effects constitutes a determinant of immunisation services utilisation among mothers in Bayelsa West Senatorial District. The mean responses of items 36 – 40 are 3.15, 3.18, 2.93, 2.67, and 2.73, respectively. The mean values of each of the item were greater than the decision mean, hence, this means that fear of immunization makes children to be vulnerable to vaccine preventable disease, fear of AEFI have increased non-compliance rate in immunization, fear of vaccine preventable disease, I am afraid because my children always develop high body temperature, and there is always the issue of convulsion with my child when immunized. The grand mean score obtained was 2.80, indicating to a great extent that phobia of side effects constitutes a determinant of immunisation services utilisation among mothers.

The result from Table 5 shows the mean responses of the extent to which inadequate health care providers constitute a determinant of immunisation services utilisation among mothers in Bayelsa West Senatorial District. The responses of the mothers show that the mean values of items 41 – 44, such as 3.22, 3.28, 3.10 and 2.59, are above the decision mean value of 2.50, while item 45 has a mean value less than the decision mean value. Specifically, the respondents agreed that an inadequate number of health care providers can hinder the uptake of immunisation. Staff inadequacy in carrying out immunisation services can hinder immunisation uptake. A proportionate number of staff to deliver effective immunisation services can increase uptake and reduce long waiting times for mothers due to inadequate staff strength, resulting in low immunisation uptake. In disagreement, the respondents indicated that health workers complain that the number of children to be immunised can decrease immunisation uptake. The table reveals a grand mean score of 3.02, which is above the decision mean score. This implies that to a great extent, inadequate health care providers constitute a determinant of immunisation services utilisation among mothers.

Table 6 shows the mean responses of the extent to which mothers' occupation constitutes a determinant of immunisation services utilisation among mothers in the Bayelsa West senatorial district of Bayelsa State. From the table, items 46 – 50 have mean values of 2.63, 2.77, 2.87, 2.87, and 2.86, respectively. Since the mean values are above the decision mean value of 2.50, it shows the agreement of the respondents that the mothers working status encourage immunization uptake, mothers who have money does not like to take their children out for immunization, poor mothers always have their children

Table 5. Mean responses of the extent to which inadequate health care providers constitute a determinant of immunisation services utilisation among nursing mothers in Bayelsa West Senatorial District.

S/N	Inadequate health care providers	SA	A	D	SD	Mean	Std. D	Decision
41	Inadequate amount of health care providers can hinder the uptake of immunisation	182	530	51	10	3.22	0.70	High Extent
42	Staff inadequacy in carrying out immunisation services can hinder immunisation uptake	203	264	21	20	3.28	0.72	High Extent
43	A proportionate number of staff to deliver effective immunisation services can increase uptake	173	245	60	30	3.10	0.83	High Extent
44	Long waiting times for mothers due to inadequate staff strength result in low immunisation uptake	239	36	18	215	2.59	1.43	High Extent
45	Health workers complain that the number of children to be immunised can decrease immunisation uptake	191	51	25	241	2.38	1.39	Low Extent
	Grand mean					**3.02**	**0.96**	**High Extent**

Table 6. Mean responses of the extent to which mothers' occupation constitutes a determinant of immunisation services utilisation among nursing mothers in Bayelsa West Senatorial District.

S/N	Employment status of nursing mothers	SA	A	D	SD	Mean	Std.D	Decision
46	The mother's working status encourages immunisation uptake	167	142	41	158	2.63	1.23	High Extent
47	Mothers who have money do not like to take their children out for immunisation.	167	128	141	72	2.77	1.06	High Extent
48	Poor mothers always have their children immunised	124	273	32	79	2.87	0.96	High Extent
49	High-class workers do not regard immunisation services.	178	134	146	50	2.87	1.01	High Extent
50	Mothers who are not employed lack transport fare to the immunisation site	169	158	123	58	2.86	1.01	High Extent
	Grand mean					**2.80**	**0.85**	**High Extent**

immunized, high class workers do no regard immunization services, and mothers that are not employed lack transport fair to immunization site. However, the grand mean score of 2.80 clearly shows that, to a great extent, mothers' occupation constitutes a determinant of immunisation services utilisation among mothers.

DISCUSSION

Spousal approval and immunisation services utilisation

In contrast to all previous findings, this study identified that spousal approval was not a significant determinant factor of the utilisation of immunisation services among mothers. This is a finding that is also not supported by the reports of other studies, including the study which revealed that study participants who had high approval were 2.45 times more likely to vaccinate their children than those who had unfavourable approval (OR= 2.45, 95%CI: 1.67-3.59) (Gojjam *et al.,* 2017). This finding also has important implications for healthcare practice, gender dynamics, and public health programming. This suggests that mothers' decisions to utilise immunisation services for their children are largely autonomous and not heavily dependent on their husbands' consent. It reflects growing awareness and empowerment among women to make independent health-related decisions, particularly concerning their children's wellbeing. However, the finding also highlights that while spousal approval may not be a determining factor, engaging fathers remains crucial in promoting the tenets of family health.

Communal conflict and immunisation services utilisation

The effect of communal conflict on the uptake of immunisation services was also assessed in this study, and it was identified that it was significantly associated with the uptake of these services among the study population. This view was also shared by those of the National Primary Health Care Development Agency (Oyekale, 2017), which highlighted insecurity as a potential threat to the optimal uptake of immunisation services among nursing mothers.

This result suggests that, despite the presence of insecurity or communal tensions, immunisation activities may have continued with minimal disruption, possibly due to effective health system adaptation, strong community engagement, or the prioritisation of immunisation by caregivers. It indicates that caregivers recognise the importance of vaccination for their children's health and are willing to overcome barriers posed by insecurity to access these essential services. This resilience highlights the effectiveness of ongoing public health awareness campaigns, community-based health initiatives, and outreach programs that maintain service delivery even under challenging social conditions (Yahaya *et al.,* 2024).

Sustained collaboration with community gatekeepers, traditional rulers, and local volunteers can further strengthen access and acceptance of immunisation services during crises. However, this finding should not lead to complacency; rather, it should motivate continued investment in security-sensitive health delivery models and community outreach (Akpe and Odikeme, 2024).

Phobia of side effects and immunisation services utilisation

Regarding the effect of phobia of the side effects of vaccination among the mothers, it was identified in this study that the phobia they had regarding the side effects of vaccination significantly affected their utilisation of immunisation services. This finding is corroborated by reports from previous studies showing that fears of immunisation safety and related side effects, as well as vaccination misconceptions, are capable of affecting immunisation service uptake among mothers (Mahachi *et al.,* 2022). Another study also showed that in the postnatal period, vaccination behaviour among nursing mothers was more likely to occur when their confidence in vaccine effectiveness was high. This has critical implications for healthcare delivery, public health communication, and immunisation program design. Fear of side effects, whether based on personal experiences, community rumours, or misinformation, can greatly influence caregivers' willingness to bring their children for vaccination (Mahachi *et al.,* 2022).

Moreover, healthcare providers should be trained to recognise and manage adverse events following immunisation (AEFIs) promptly and transparently, as effective management reduces anxiety and prevents misinformation from spreading within communities (Obasohan *et al.,* 2015a,b). This finding also calls for the integration of community engagement and social mobilisation into immunisation strategies. Collaborating with community leaders, religious figures, and local influencers can help dispel myths and reinforce public confidence in vaccines. Media campaigns should highlight success stories and scientific facts about immunization benefits while countering narratives that could be driven by fear (Mahachi *et al.,* 2022).

Inadequate health care providers and immunization services utilization

This study also identified that the inadequacy of health care providers significantly affected the utilisation of immunisation services among nursing mothers. Authors have also made similar reports in their studies that showed human resources for health inadequacy as being capable of adversely affecting the utilisation of immunisation services (Afiong *et al.,* 2017). It is important to note that an inadequate number of trained health workers can result in irregular immunisation sessions, long waiting times, poor service quality, and missed opportunities for vaccination. These are outcomes which gave the capacity to discourage caregivers from utilising immunisation services. Health workforce availability and adequacy can thus be seen to be critical determinants of immunisation coverage and overall healthcare system performance. When there are too few skilled staff, especially in rural or underserved areas, access and continuity of care are compromised, thereby increasing the risk of outbreaks of vaccine-preventable diseases (Afiong *et al.,* 2017).

Religious ideology and immunisation services utilisation

This study also assessed how religious ideology was associated with the utilisation of immunisation services. It was identified that the religious ideologies of the mothers were not significantly associated with their utilisation of immunisation services. It indicates that most caregivers, regardless of their religious background, recognise the health benefits of vaccination and are willing to participate in immunisation programs (Mahachi *et al*., 2022). This reflects growing public awareness, successful health education efforts, and effective collaboration between health authorities and religious institutions in promoting immunisation as a life-saving public health measure.

Health care-wise, this finding implies that religious differences are no longer a significant obstacle to immunisation utilisation, allowing health workers and policymakers to focus more on other determinants such as accessibility, service quality, and maternal knowledge. It also demonstrates that prior efforts to engage faith leaders and integrate health messages into religious platforms may have contributed to normalising immunisation practices across diverse communities. Maintaining this partnership between health systems and religious organisations remains essential for sustaining public trust and ensuring continued community participation in vaccination programs (Yahaya *et al.,* 2024). Although religious ideology may not be a statistically significant factor, continuous engagement with faith-based groups remains vital, as misinformation or emerging ideological resistance can still arise. Health educators should continue collaborating with religious leaders to reinforce accurate vaccine information and dispel potential myths. This proactive approach helps maintain broad-based community

support for immunisation and strengthens the social acceptance of preventive healthcare (Abubakar *et al.,* 2021; Gao *et al.,* 2021).

Mothers' occupation and immunization services utilization

Finally, the occupation of the nursing mothers was assessed for its association with the utilisation of immunisation services. It was identified that the occupation of the mothers was significantly associated with the utilisation of the immunisation services. This view was, however, not shared by the study conducted in Benue state in Nigeria, which reported that immunisation was utilised more by women who were unemployed and self-employed (Musa and Kitoye, 2024).

Conclusion

The factors identified influencing immunisation services utilisation among mothers are communal conflict, flexibility, and accessibility to immunisation service provision, which should be encouraged. Health authorities should also consider extending clinic hours, organising weekend or evening sessions, and strengthening outreach programs to accommodate working mothers. Workplace-based immunisation campaigns, especially in large organisations, markets, and factories, can also enhance coverage among employed mothers.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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