

Barriers to Effective Immunization in Urban Slums of Warri and Environs, Delta State Nigeria.

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ABSTRACT: *Immunization uptake in Nigeria though has improved over the last few years, is still considered as low when compared to standards expected, especially in slum areas. This study researched on likely barriers to effective immunization in urban slums of Warri and environs, Delta State, Nigeria. A Cross-sectional data collection was done, entailing 1423 respondents from whom valid responses were collected and analyzed. The results indicate that parental attitude, inadequate information from health officials to parents of children, inadequate engagement with community authorities, not knowing immunization schedules, setting immunization in an odd time of recipients, competing priorities of parents (too busy), general apathy to uptake of health services, poor understanding of the importance of immunization, fear of side effects of immunization among others are key barriers to uptake of immunization in slum areas which are all linked to inadequate information and education to beneficiaries of vaccination program. The paper concludes that awareness creation and education before the commencement of all immunization activities in such locations.*

KEY WORDS: *Immunization, urban slum, Warri and Delta, Nigeria*

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I. INTRODUCTION

Nations all over the world have come to rely heavily on immunization as a public health intervention strategy for reducing morbidity and mortality of children, especially in developing countries [1]. Available records indicate that well over 10 million of children in low and middle income countries die before getting to their fifth birthday due to the inability of such children to access preventive interventions which would have aided their fight against preventable childhood diseases [2]. In Nigeria, in order to mitigate high infant mortality, the World Health Organization's Expanded Program on Immunization (EPI), which was established in 1974 has been adopted to cover preventable childhood diseases such as: tuberculosis, poliomyelitis, diphtheria, pertussis, tetanus, hepatitis B, yellow fever and measles. According to Abdulraheem et al [3], the Nigeria EPI prescribes five visits to receive one dose of Bacille Calmette Guerin (BCG), four doses of oral polio vaccine, three doses of diphtheria, pertussis and tetanus vaccine, and one dose of measles vaccine. The program in response to World Health Organization standard, also included hepatitis B and yellow fever vaccines in its schedule in 2004, stipulating the uptake of three doses of hepatitis B at birth, at six weeks of age, and at 14 weeks of age while yellow fever should be given at nine months of age, along with measles vaccine [3]. Evidence available points to the fact that in spite of the effort in the health sector of Nigeria to use immunization to tackle childhood diseases, children still die of preventable diseases due to inadequate levels of immunization against childhood diseases, and this has remained a significant public health problem in resource-poor areas like urban slum of Warri and environs of Delta State, Nigeria.

1.2 Background to the Study

The Nigeria government through the Ministry of Health using her Primary Health Care Resources, has consistently implemented EPI as a strategy to prevent child mortality [4]. The Nigerian National Routine Immunization Strategic Framework (NNRIS) is guided by the principles and immunization targets set in the National Strategic Health Development Plan (NSHDP). It is further linked to the Nigeria's Expanded Program on Immunization (EPI) comprehensive Multi-year plan which is aimed at reducing morbidities and mortalities related to vaccine preventable diseases. The NNRIS framework is focused on Routine Immunization, with emphasis on increasing immunization access and utilization while reducing the number of unimmunized children, efficient logistics and supplies management as well as adequate engagement of stakeholders. The goal of NSHDP is to reduce morbidity and mortality from diseases scheduled for protection by vaccination in Nigeria. However, evidence available revealed that; in spite of the implementation of the framework, infectious diseases remained the leading cause of death in different parts of the country, especially in poor areas like urban slums and the rate of routine immunizations in Nigeria had remained one of the lowest rates of childhood immunization in the world [5, 6]. According to the 2013 NDHS [7], only 25.3% of children age 12-23 months received complete vaccination as against 20.7% who did not receive any form of vaccination, thus indicating about 54% who received Partial or incomplete vaccination.

A report on Africa's immunization coverage released by the World health Organization (WHO) at the Ministerial Conference on Immunization in Africa held in Addis Ababa on February 24-25 2016, ranked Nigeria among countries with unimpressive record in routine immunization coverage. Furthermore, immunization rate varies from one part of the country to another [7]. Some of the localities characterized by low level of immunization are the urban slum areas[7,8]. While an urban locations present us with advantage for effective immunization services, such as: reaching many persons within a densely population area with minimum cost and shorter distances and time, the same advantage of high density and closeness lead to crowded living promoted by high birth rates and continuous influx of new susceptible from rural areas, which generate cycle of disease. Hence, urban slums have special problems that warrant the development of strategies designed specifically for them [9, 10]. Warri and her environ in Delta State of Nigeria provide examples of a rapidly growing urban complex characterized by many slum communities which are characterized by low immunization.

Various reasons have been adduced for the low access to immunization in slum communities which have been broadly categorized into: Health System barriers, providers' barriers and parental barriers [12]. For Hadler et al [13], reasons for low immunization which they described as factors for low receipt of vaccines are classified as: immunization system, communication and information, family characteristics and parental attitude/knowledge. Esposito et al [12] listed health system barriers to include: cost for system administration, difficulties in vaccine storage, vaccine shortages, inadequate information to beneficiaries, changes in staff workflow, lack of system to collect vaccination status of individuals leading to poor understanding of vaccination status of beneficiaries and missed opportunities. The main providers' barriers identified by Esposito et al include: Poor access to children's immunization records, Missed visits, missed opportunities and Poor communications with parents and adolescents. Parental barriers put forward by Esposito et al include: poor understanding of the essence of immunization, fear of adverse effects, poor understanding of immunization schedules, and logistic problem of reaching points of immunization which is tied to their economic status. Favin et al [14] in their collaboration with WHO, provided a variation of these factors and attempted to provide the most important factors that account for low immunizations in different parts of the world in their examination of global immunization literatures. According to Favin et al [14], though most of the factors are interrelated, services factors such as provider attitude and parental attitude were seen as very important barriers to immunization. However, their ranking of the factors indicated that: parental attitude, distance, travel conditions access, poor staff motivation, staff attitude were the most important barriers to immunization, which were the situations in Nigeria and Liberia according to their study [15, 16, 17]. These were closely follow with factor of fear of side effect, logistics challenges and missed opportunities.

Favin et al [14] further categorized the factors of immunization into: Major causal factors and Major Risk factors. The major causal factors from their perspective are: bad experiences at immunization services, leading to fears, negative expectations, and lack of trust (family factor) which relates to health workers attitude; competing priorities -too busy(family factor) relating to approaching service users at inconvenient hours; missed opportunities, which comes from parents' attitudes and fears to have sick child immunized ; fears/rumors (family factor) connected to insufficient/ineffective health communication, engagement with community leaders and groups (service factors); Lack of appreciation of the basic benefit of vaccination (family factor) related to insufficient/ineffective health communication, engagement with community leaders and groups(service factors) and Lack of understanding of need for multiple doses, when and where to return, that immunization protects against certain specific diseases (family

factor) stemming from insufficient/ineffective health communication, engagement with community leaders and groups (service factors). As for Major Risk factors as barrier to immunization, Favon et al [14] list included: Place of residence (rural, distant from a health facility) (family factor) connected to insufficient facilities; unreliable services/outreach, restricted/inconvenient service hours (service factors); Poverty (family factor) related to health worker attitudes and behaviors; charges (official and unofficial) (service factors) and mothers' education (family factor) stemming from insufficient/ineffective health communication, engagement with community leaders and groups (service factors). A close examination of these major causal factors and Major Risk factors indicate that each can be classified within the categories of: Health System barriers, providers' barriers and parental barriers as categorized by Esposito et al [12].

In Nigeria, while the situation of immunization has improve to some extent, the rate of coverage especially in slum areas like evident in the slum of Warri and environs is still a far cry from what is needed due to varying factors, hence, it is pertinent to understand the barriers to effective immunization services in the urban slums of Warri and environs, Delta State, Nigeria. The identification of these factors will enable health providers as well as the government plan appropriate strategies in order to overcome the factors, thereby promoting improved immunization reach for the people of the locations like the slum of Warri and environs particularly and Nigeria in general.

II. METHODOLOGY

2.1 Study Area

This study was carried out in 7 slum communities in Warri and environs, Delta State, Nigeria as follows: (i) Merogun community located close to Essi College and bounded by Iyara community by the south; (ii) Iyara community area is located along the stretch of the Warri River and started out as trading points with very poor road networks. Over time, people started erecting houses with planks and corrugated iron sheets. During immunizations, houses located in front streets enjoyed more coverage leaving houses located in the interiors with inadequate coverage; (iii) Fenegbene located in the Island opposite Mciver Market area of the city. The area is made up very high population density and very poor housing qualities which are mostly planks. Modern infrastructures such as good road, electricity, water, health centers are hardly available. Today, the resident had grown to accommodate a very high population without modern facilities with crowded substandard houses with poor coverage of immunization; (iv) Ovwian Traditional Community is made of old traditional houses which are highly substandard and dilapidated with crowded persons. Existing spaces in the traditional compounds are covered with houses and routes to those places blocked in the process, thereby making immunization a difficult task during the exercise; (v) Orhunwhorhun Community is one of the traditional communities providing residential and commercial houses to influx of persons from diverse ethnic groups due to the ethnic wars in Warri City. The area is overcrowded with persons and over stretched and substandard facilities with very poor road network which increase the burden of immunization and poor coverage. (vi) Igbudu a traditional commercial community with very high population density occasioned by erection of houses in traditional sites and within market location. (vii) Hausa Quarters which is an extension of Igbudu community but predominantly occupied today with persons from the northern part of Nigeria who are involved in various commercial activities with sales of goods from the north part of Nigeria

2.2 Data Collection

The study took place in 7 slums in different parts of Warri and environs using a quantitative approach in data collection. This involved, a cross-sectional community-based study that was carried out with 1,505 caregivers with children aged 12-23 months were covered. The respondents met the inclusion criteria of being residents in the slum areas for a period of not less than 2 years. A household survey in which data were collected from caregivers (parents or guardians) of the selected children using a pre-tested semi structured questionnaires by a door to door approach. Information collected included the socio-demographic characteristics as well as knowledge, attitude and perceptions of caregivers towards immunization, immunization status of the children and barriers to effective immunization in the selected slum areas. A sample size of 1505 caregivers was selected for the entire study based on the rule of the thumb, since 1500 and above is seen as representative of the population of expected study area, with a 215 participants selected from each slum community using a multi-stage sampling approach. In each slum area, the sample size for the survey participants was proportionally distributed across the all the residential blocks units based on sizes of the blocks. Each block was demarcated into blocks of housing units to ensure that people in all parts of the block have an equal chance of being included in the sample. All the blocks were listed and the number of housing units equivalent to the number of survey participants assigned to the block was randomly selected using the random number function in Microsoft Excel. In each selected block, one caregiver and one child aged 12-23 months

were randomly selected. Out of the administered 1,505 to respondents, 1423 were returned and filled successfully. Field workers were recruited to collect the data. They were supervised in the field by Research Coordinator. Field manuals were developed for the field workers and the Coordinator. The traditional birth attendants, members of the community based organizations and market women assisted in mobilization of respondents for the study. The study was carried out between August, 2017 and March, 2018

2.3 Data Analysis/Ethical Consideration

The Statistical Products and Service Solutions (SPSS) by IBM, version 22 was used for data analysis in this study. First the analysis involved the use of descriptive statistics such as frequency tables, percentages to elucidate respondents' demographic characteristics. Cross tabulations were used to analyze barriers to immunization and other variables in the study.

Ethically, approval for this work was given by Centre for Population and Environmental Development Ethical Committee. Though the study is classified as a low risk one in term of the objects of investigation, At all levels, participants were briefed on the study objectives and their consents was received verbally before administering any of the research protocols. In addition, all the participants were informed of their right to withdraw their participation in the study at any stage. The participants were also assured of their anonymity during and after the study.

III. RESULTS AND DISCUSSIONS

3.1 Characteristics of study Participants

Table 1 indicates that the survey covered 1423 persons from valid questionnaires that were administered and retrieved comprising 783(55%) of women and 640 (45%) men with 579 (40.6%) of them 30 or less years compared to 844 (59.4) of them that were more than 30 years. The participants were more of Pentecostal 665 (46.7%), protestants 565 (39.7%), catholic 123 (8.6%) and others 70 (5%) in term of their religion. Occupationally, majority of them 631 (44.3%) were self-employed; 308 (21.6%) were civil servants; 154 (10.8) and 126 (8.9%) were into fishing and farming respectively. However, a good number of the participants 204 (14.4) were unemployed at the time of the survey. The survey showed that a greater proportion of the participants 780 (54.8%) have attended secondary schools, followed by 407 (28.6%) of them with primary education and 94 (6.6%) who attended one form of tertiary school or the others. More of the respondents 489 (34.3%) and 467 (32.8%) earn less than ₦10, 000 (Less \$32) and ₦31, 000-₦50, 000 (\$101-\$167) respectively. Most of the households surveyed were relatively large in size, since most of them have five to six members 510 (35.8%) and seven members 479 (33.8%). This is not surprising considering the crowded nature and congestion in the close spaces within the study slum communities.

Table 1: Selected characteristics of the survey's respondents (N=1423)

Characteristics	Number	%
Sex		
Male	640	45
Female	783	55
Age (Years)		
30 or less	579	40.6
More than 30	844	59.4
Religion		
Catholics	123	8.6
Protestants	565	39.7
Pentecostal	665	46.7
Others	70	5
Occupation		
Farming	126	8.9
Fishing	154	10.8
Civil Service	308	21.6
Self Employed	631	44.3
Not Employed	204	14.4
Highest Level of Education		
Non	142	10
Primary	407	28.6
Secondary	780	54.8
Tertiary	94	6.6
Monthly Income (N)		
Less than 10,000	489	34.3
11,000-30,000	344	24.1

31,000 -50,000	467	32.8
More than 50,000	123	8.6
Household Size		
1-2	132	9.2
3-4 Members	302	21.2
5-6 Members	510	35.8
7 Members and above	479	33.8

3.2 Knowledge and attitude on immunization

The knowledge and attitude of respondents regarding immunization are revealed in Table 2. An extremely high proportion of the participants (96.4%) have heard of immunization. This is not surprising, since most people in the city irrespective of their locations, have been exposed to immunization messages due to the Nigeria Expanded Program on Immunization (EPI) which encourages all State Ministry of Health to campaign on the exercise. The result from this study is similar to the one of Tagbo et al [4] that found out in their study that 95.4% of the respondents have heard at immunization. Table 2 equally showed that, a preponderant of the respondents (71.5%) have knowledge concerning the objective of immunization since they believed in the efficacy of immunization in preventing childhood diseases. This position is supported by other studies that indicate that most of their participants were knowledgeable about the usefulness of immunization in preventing childhood diseases [1, 4, 18]. Table 2 also indicates that 58.5% of the respondents in this study were knowledgeable that all children be immunized before 12 months of age. The figure from this study is low when compared to the result of similar study by Olumuyiwa et al [1], where a preponderant of the participants (89.7%) have knowledge that all children be immunized before 12 months of age. Thus, it shows a relatively lower knowledge when gaged against the participants from the earlier study. Evidence from this study revealed that the participants have positive attitude on immunization. As found in Table 2, 87.3% and 79.6% of the respondents responded in the affirmative when interrogated if they would advise others to get their children immunized and whether the time spent on immunization is worth it respectively, which agreed with the work of Olumuyiwa et al [1] where the respondents equally showed positive attitude on immunization.

Table 2: Respondents’ knowledge and attitude on immunization

Variables	Yes		No		I don’t know		Total	
	No	%	No	%	No	%	No	%
Knowledge								
Have you heard of Immunization	1372	96.4	0	0.0	51	3.6	1423	100
Immunization can prevent childhood diseases	1017	71.5	101	7.0	305	21.5	1423	100
It expected that all children be vaccinated by 12 months of age	832	58.5	356	25.0	235	16.5	1423	100
Attitude								
Would advise others to get their children immunized	1241	87.3	125	8.7	57	4.0	1423	100
Time spent on immunization is worth it	1133	79.6	92	6.5	198	13.9	1423	100

3.3 Immunization Status of participants’ children, frequency and timing of immunization

On the proportion of respondents that have taken part in immunization of their children in the recent past, Table 3 revealed that 78.7% of the participants in the study have immunize one child or the other. However, a good proportion (20.1%) were of the view that they have never immunized their children. Thus, the findings from this study agreed with DHS 2013[7] that as high as 20.7% the respondents never participated in any form of immunization – an indication that, some children grow up without taking immunization with attendance difficulties associated with refusal to be vaccinated.

Table 3: Immunization Status for participants’ children

	Yes		Have immunized but not in recent past		I have never immunized any child		Total	
	No	%	No	%	No	%	No	%
Have immunized my children in the recent past (within the last years)	1120	78.7	17	1.2	286	20.1	1423	100

Table 4 showed the likelihood of the completeness of immunization schedules by looking at the frequency of immunization. From the table, it is evident that a large proportion of the respondents - 50.9% and 24.7% that

immunized their children in the recent past did not completed their schedules since they only had vaccination for 1-2 and 3-4 times respectively. However, 24.4% had immunization for their children for 5-6 times and for more than 6 times, an indication that these person completed their immunization schedules for their children. Thus this study again support the finding of 2013 NDHS [7] that only 25.3% of children complete their vaccination. Therefore, 74.7% of the 78.7% that have recently immunized their children did not receive the complete doses of all required immunization. Esposito et al [12] and Lapalco & Sprenger [19] believed that the cycle of re-occurrence of childhood diseases is explain by inadequate vaccination due to refusal of beneficiaries to complete the required doses and this had led the outbreaks of measles among an increasing number of children.

Table 4: Frequency of immunization (Completeness of Immunization-N-1120)

	1-2 times		3-4 times		5-6 times		More than 6 times	
	No	%	No	%	No	%	No	%
How many time has each of your children be immunized in the recent past	570	50.9	277	24.7	120	10.7	153	13.7

Like, frequency of immunization in the study, Table 5 indicate that only 23.8% of children of respondents took their immunization immediately after birth and later after they were born – thus revealing that, these are the ones likely to have full vaccination in line with the study by Edmunds et al [20]. The implication of this situation is that, these children are still exposed to childhood diseases in spite of their immunization since the exercise was not effectively carried out. Hence, the status quo of child diseases remains despite decades of program due to the negation of the recommendation of the Nigeria EPI according to the findings of Abdulaheem et al [3].

Table 5: Timing of vaccine taken by respondents' children

	Given immediately after birth		Given much later after birth		Taken immediately after and later after birth	
	No	%	No	%	No	%
Timing of Vaccine Reception	488	43.6	365	32.6	267	23.8

3.4 Most Important barriers to effective immunization in the slums of Warri and Environs

Plethora of barriers were identified by the study participants as obstacles militating against effective immunization of their children. From Table 4 and 5, it is obvious that the slums in Warri and her environs still suffer from partial immunizations since most the children immunized did not received the required doses of all the vaccines as prescribed by the Nigeria EPI. Table 6 and 7 brought an understanding of the reasons the vaccination in these slums were not effective. Table 6 revealed the ranking of the individual variables in the different slum communities where data were collected with average proportion for each variable. These were ranked in Table 7 to indicate the most important barriers to effective immunization in the studied area.

Table 6: Percentage reasons responsible for low immunization in Warri and Environs by variables and by individual research locations

Variables	N=211*		N=202*		N=205*		N=203*		N=198*		N=204*		N=200*		Average % of individual Variable in research
	Ovwian		Merogun		Iyara		Igbudu		Hau Quarters		Orhunworun		Fenegbene		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
1. Distance to immunization centers	97	46	101	50	90	44	85	42	91	46	61	30	78	39	42.4
2. Father opposed immunization	72	34	81	40	92	45	63	31	57	29	55	27	86	43	35.5
3. Poor understanding of the importance of immunization	137	65	160	79	143	70	138	68	152	77	131	64	110	55	68.2
4. Due to shortage of vaccines from health officials	30	14	40	20	37	18	37	18	26	13	43	21	24	12	16.6
5. Inadequate information from health officials to parents of children	198	94	180	89	185	90	191	94	156	79	184	90	180	90	89.4
6. General apathy to uptake of health services	147	70	131	65	137	67	158	78	172	87	163	80	122	61	72.5
7. Cost of Vaccines	44	21	38	19	41	20	61	30	53	27	63	31	44	22	24.2
8. Fear of side effects of immunization	129	61	141	70	137	67	146	72	135	68	157	77	114	57	67.4
9. Myths and rumorm that vaccines have been poisoned	127	60	137	68	121	59	128	63	121	61	132	65	136	68	63.4
10. Waiting too long to receive immunization	127	60	117	58	117	57	108	53	109	55	110	54	1000	50	55.2
11. Attitude of immunization staff	122	58	121	60	119	58	112	55	191	51	104	51	98	49	54.5
12. Immunization staff did not show up as expected (Missed Visits)	116	55	121	60	121	59	106	52	97	49	98	48	114	57	54.2
13. Poor staff motivation	95	45	101	50	88	43	95	47	77	39	91	45	80	40	44.1
14. Inadequate engagement with community authorities	188	89	180	89	174	85	179	88	178	90	177	87	166	83	87.2
15. Being new migrants	95	45	89	44	88	43	79	39	65	33	75	37	80	40	40.1
16. Parental Attitude	194	92	190	94	191	93	189	93	174	88	183	90	192	96	92.2
17. Consideration of the health status of the child	84	40	89	44	86	42	79	39	65	33	61	30	86	43	38.7
18. Competing priorities of parents (too busy)	167	79	147	73	164	80	162	80	178	90	122	60	140	70	76
19. Not knowing immunization schedules	169	80	160	79	166	81	182	90	172	87	151	74	182	91	83.1
20. Setting immunization in an odd time of recipients	175	83	149	74	172	84	156	77	158	80	138	68	178	89	79.2
21. Unpleasant previous experience relating to immunization	124	59	121	60	114	56	112	55	114	58	106	52	112	56	56.6

*Analyzed questionnaires for each research community

3.4.1 Parental Attitude as barrier to effective immunization

From Table 7, parental attitude ranked the most fundamental barrier (92.2%) to effective immunization. Parental attitude as barrier to vaccination, comes in the form parents’ refusal to make their children available for immunization due to: their ignorance, fear of side effects [21, 22], their religious belief, cost consideration, perceived sickness of the children to be immunized, inconvenient schedule of immunization among others. This finding corroborate with that of Favin et al [14] and Esposito et al [12] that found in their respective studies the crucial nature of parental attitude as a key factor to effective immunization. Other studies which supported this finding are those of Olumuyiwa et al [1],Abdulraheem et al [3] and Prislin et al [23].

3.4.2 Significance of information and community engagement in immunization

The second and third most significant barriers to immunization efficacy in the slums of Warri and environ from Table 7 were inadequate information from health officials to parents of children (89.4%) and inadequate engagement with community authorities (87.2%). The effects of inadequate information to parents and inadequate engagement of community authorities by health officials could result to varying results. In fact, Aboubakary et al [18] found out in their study that citizens’ awareness of immunization program is related to amount information made available to the beneficiaries. Central to making of information available to beneficiaries of immunization is community engagements. Hence, community mobilization and engagement to provide required information regarding vaccination activities and procedures; is a necessary requirement to the success of any immunization exercise [24, 25]. Therefore, every immunization program should be preceded with adequate awareness creations, entailing detailed information to the beneficiaries. Relatedly, not knowing immunization schedules and fixing immunization times during odd times ranked the fourth (83.1%) and fifth (79.2%) respectively. These could be product of inadequate information from health providers due to limited engagement of the recipient communities resulting in missed opportunities and wrong timing for immunization as the studies byOzcirpicia et al [26].

3.4.3 Parental priorities, apathy and understanding of the importance of immunization

The competing priorities of parents (busy schedules), their general apathy to uptake of health services and poor understanding of the importance of immunization formed the next ranking of barriers to effective vaccination with 76%, 72.5% and 68.2% respectively as evident in Table 7. With struggle by parent of children to survive tough economic situation, parents are committed to other ventures other than to sit in their houses and wait for a health provider that may never show up when they should be working to provide for their households. This often leaves such parents exhausted to engage in immunization and in most cases may not be available when health providers call at their homes as the studies by LaFond [27], Uddin et al [28] and Millimouno et al [29] revealed in their works in Somalia, Bangladesh and Guinea respectively. The barrier of apathy to uptake of health services relate to attitude of parents which may be link to several previous experiences such as long waiting time due to failure of immunization staff to show up for previous immunization schedule. This may equally relate to general life situation such as lack of basic necessities such as food, which generally lead parent to resent anything around them [3]. Abdulaheem et al [3] believed that, under situation such as hunger and poverty, immunization consideration becomes secondary or non-existence in the mind of such beneficiaries. Poor understanding of the essence of vaccination have been found out to be a major barrier to immunization. Esposito et al [14] in their study found out that the degree of participation in the treatment of a diseases by parents depends on their understanding of the diseases, in term of the danger posed by it. According to them, if parents are not adequately briefed about the importance of immunization and the impact of vaccination, they may not offer their children for immunization, hence stand as barrier to the exercise.

3.4.4 Fear of side effect, myths, previous experience and immunization

The fear relating to side effects that parents have concerning vaccination have been reported in different studies to stand as barrier to effective immunization [14, 27, 30]. In this study as Table 7 indicates, 67.4% of participants picked fear of side effects of vaccination as possible barrier to effective immunization. This agreed with the work of Gellin et al [21] where a good number of the parents (25%) believed their children immune system could become weakened as a result of too many immunizations. In fact, some parent were of the opinion that immunization was more risky than non-immunization, hence it better to keep the status quo [22, 31]. This situation is more prevalent if older siblings or children once suffer some side effects in the past, it becomes an excuse for further participation in immunization [27, 32, 33]. As for myths, many unverified claims or unsubstantiated beliefs have made parents to abandon the immunization for their children. As this study revealed also in Table 7, myths (63.4%) is one of the barriers that accounts for non-vaccination of children from the participants views. This is equally supported by previous studies. For example, Favin et al [14] found out that a major cause of missed opportunity is the belief that a sick child should not be immunized. Other studies in this category were those by Abilla and Munguti [33], Babalola [34] and WHO [35]. Unpleasant previous experiences like side effects, attitude of immunization and failure of immunization staff to turn up for agreed vaccination have been linked as barriers to immunization in urban slum like Warri.

Table 7: Ranking of barriers to effective immunization

<i>Variables</i>	<i>N</i>	<i>%</i>
1. Parental Attitude	1312	92.2
2. Inadequate information from health officials to parents of children	1272	89.4
3. Inadequate engagement with community authorities	1241	87.2
4. Not knowing immunization schedules	1183	83.1
5. Setting immunization in an odd time of recipients	1127	79.2
6. Competing priorities of parents (too busy)	1081	76.0
7. General apathy to uptake of health services	1032	72.5
8. Poor understanding of the importance of immunization	970	68.2
9. Fear of side effects of immunization	959	67.4
10. Myths and rumor that vaccines have been poisoned	902	63.4
11. Unpleasant previous experience relating to immunization	805	56.6
12. Waiting too long to receive immunization	785	55.2
13. Attitude of immunization staff	776	54.5
14. Immunization staff did not show up as expected (Missed Visits)	771	54.2
15. Poor staff motivation	628	44.1
16. Distance to immunization centers	603	42.4
17. Being new migrants	571	40.1
18. Consideration of the health status of the child	550	38.7
19. Father opposed immunization	505	35.5
20. Cost of Vaccines	344	24.2
21. Due to shortage of vaccines from health officials	236	16.6

3.4.5 Long wait, staff attitude and truancy of immunization staff

For some parents who do visit health center before taking immunization for their children, long waiting time has been found to be a huge challenge in health services uptake [36, 37]. The ranking of the most important barriers to success of immunization showed that respondents considered waiting too (55.2%) as an important barrier. The factor of long waiting time as a barrier to immunization was also mentioned in a study by AlConde [38] about women of Dominican Republic that see long waiting time as a barrier to efficient vaccination. Relatedly, staff attitude is also considered a priority for the efficacy in an immunization program [14]. From Table 7, it is clear that a good proportion of the respondents 54.5% believed that attitude staff is one of the barriers to effective immunization. This was closely followed by truancy of immunization staff with 54.2% that equally speak of staff attitude. Favin et al [14] held that repulsive attitudes and behavior of health staff who treated mothers in an unfriendly, disrespectful, or even abusive manner – could discourage children's vaccination. Other studies that also mentioned negative attitude of health staff as a contributory factors to low immunization were Razum [39] and Keith [40]

3.4.6 Other barriers militating against effectiveness of immunization in the slums of Warri and Environs

From the ranking of the most important barriers to effective immunization, other factors were: poor staff motivation (44.1%), distance to immunization centers (42.4%), being new migrants (40.1%), consideration of the health status of the child (38.7%) and father opposition to immunization (35.5%). These were followed by: cost of vaccines (24.2) and shortage of vaccines from health officials (16.6%). These factors as presented here have been found in other studies to be key reasons why vaccination of children has remained low. For example, Favin et al [14] and UNICEF [41] believed that, when staff are not well motivated, it leads to lack of commitment and increase in hostility to beneficiaries during immunization programs. The factor of distance as an obstacle to efficacy of vaccination becomes handy when beneficiaries get the service of immunization from health facilities. Such clients walk several kilometers while trying to access the services. When this is the case, getting the required financial requirements to fund such journeys becomes a stumbling block to accessing vaccination. Studies in the past have found out the relationship between inability to get vaccination services and the distances that beneficiaries travel. Bender and Macauley [30] in their study of immunization drop-out and maternal behavior which dealt with evaluation of reasons and strategies for maintaining gains made in national vaccination in Liberia found out that immunization was a huge challenge in accessing immunization. Similarly, the study by Babalola and Adewuyi [42] mentioned that distance to immunization was a huge challenge to immunization in six states of Nigeria. Other obstacles identified as barriers in this study to effective immunization have similarly be found to be reasons for low immunization in the studies by: Harpman [9] found out that influx of new immigrants is problematic to effective vaccination in slum areas; Abilla and Munguti [33] found out that the consideration for the health status of children by their parents was always a reason why their parents rejected immunization in Kenya. Over 35% percent of participants in this study believed that father opposition to immunization is an impediment to vaccination as also reported by the study by Babalola [34] where spousal disapproval of immunization was another common reason for non-immunization? Cost of vaccine and their shortage accounted for the last two reasons from the ranking of the reasons for low immunization with 24.2% and 16.6% respectively. That cost was one of the least factors in this study was not surprising since most of the respondents are beneficiaries of Nigeria's EPI were immunization providers' move from house to house.

IV. CONCLUSION

Though the knowledge of the respondents is high and have positive attitude, this study points to multiplicity of barriers militating against the effectiveness of immunizations. From the ranking of barriers from this study, it is obvious that parental attitude, inadequate information from health officials to parents of children, inadequate engagement with community authorities, not knowing immunization schedules, setting immunization in an odd time of recipients, competing priorities of parents, general apathy to uptake of health services, poor understanding of the importance of immunization, fear of side effects of immunization, myths and rumor that vaccines have been poisoned, unpleasant previous experience relating to immunization among others. A closer look at all the barriers revealed a central barrier which relates to lack of adequate information to the beneficiaries. Like Aoubakary [18] concluded in his study of factors of complete immunization in Nouna district of Burkina Faso, beyond reaching the communities, one of the major goals of Immunization activity should be to get people to better understand what vaccination is about and what is at stake. This position has become necessary due to the facts that most of the barriers relate to poor communication around immunization. Though immunization coverage has become better in most cities in Nigeria, locations such as urban slums like those in Warri and Environs are still having

difficulty in reaching acceptable level of immunization due to combination of barriers, chiefly among them is parental attitude and lack of communication. It is pertinent that program are put in place to create awareness and educate the population of such localities for better immunization coverage in Delta State in particular and in Nigeria in general during vaccination activities.

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