# Vaccine Preventable Diseases and the Challenges of Immunization Exercise in Nigeria

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## Abstract

Immunization in Nigeria has been one of the controversial issues. Many studies on immunization in Nigeria have focused on the influence of cultures on the success of immunization, alternatively this study explores the challenges of immunization exercise towards eradicating Vaccines Preventable Diseases in Nigeria. The study utilized secondary source of data, mostly academic journals, thesis and dissertations as well as unpublished materials. The study utilised theoretical exploration of risk and benefits of immunization. The study found that, reaction to immunization is not recent and had faced series of confrontations over the years. While in Nigeria vaccination resistance is more common in the northern Nigeria where majority of the inhabitants are mostly Muslims, the majority of the antagonists are of the view that vaccination is forbidden considering its effects and how it is sourced. Whereas others believed that vaccination is lawful in Islam. The study further concluded that though immunization coverage has increased, resistance to vaccination would continue depending on the level of awareness among Nigerians. The study recommended more public sensitization and provision of more reliable vaccines to Nigerians.

**Keywords: Immunization, Preventable Diseases and Vaccines.**

## Introduction

One of the challenges of Nigeria's quest for health care service delivery is to control vaccine preventable diseases. Study indicates that infant mortality rate was 100 per 1000, whereas infant mortality rates were 65 per 1000 (UNICEF, 2018). Nigeria is the most populous country in Africa and the largest black nation on earth. But a significant number of its population dies before reaching five years. Vaccine-preventable diseases in Nigeria account for about 22% of childhood deaths (amounting to over 200,000 deaths) per year (Jamo, 2017). Nigeria is signatory to all global immunization and MDG4 target of reducing child mortality by two-thirds by the year 2015 (NPI, 2007). Several efforts were made by the successive administrations to curve the persistence incidence of vaccine preventable diseases, however, study shows the contrary, child mortality as a result of vaccine preventable disease has been on the increase (Jamo, 2017). Immunization has been considered among the best, simple and cost effective health intervention aimed at reducing mortality rate due to vaccine preventable diseases. However, in spite of this scientific development, success of vaccination especially in Nigeria has been confronting several challenges. One of such challenges is cultural belief and resistance by the scientific communities. Though global resistance to vaccination is not recent in Nigeria, it was not pronounced until recently. What fuelled the resistance was the increasing cultural influence and campaign by the scientific communities who are divided into pro and anti-immunization. While there has been remarkable improvement in reducing childhood morbidity and mortality in Nigeria, it is yet to reach its full potentiality because of the resistance to immunization especially in the northern part of Nigeria. This is partly due to the resistance to immunization in Kano, Kaduna and Zamfara States which are predominantly Muslims (Sulaiman, 2014).

Some Islamic scholars are of the view that, certain issues regarding immunization need to be taken into consideration. These issues include the lawfulness of the immunization itself in Islam, its effects to the public particularly the immunized children and how the vaccine is sourced. While others are of the belief that immunization in its totality is lawful and should not be discouraged. Even though there are a number of literatures on factors that led to failure or success of immunization. We know little about conceptions of religious clerics to immunization and scientific communities. This study provides both positions. The paper relied on secondary source including journal articles, conference papers, magazines as well as unpublished materials. The scope of the study is between 1999 and 2018. The choice of the period is due to high resistance to immunization. The paper is divided into four sections. The first is the introduction, followed by exploration of religious belief and success of immunization in the second section. The third is the development of vaccines and immunizations. Finally, the fourth section is the findings, conclusion and recommendations.

**Development of Vaccines and Immunization**

Before the advent of modern immunization, six killer diseases had posed endemic challenge to children survival and development worldwide. The contemporary immunization can be linked to experiment conducted by Edward Janner in 1796. Initially, Janner noticed that some dairymaids seemed protected from small pox if they had already been infected by much less dangerous virus caused by cowfox. To test his assumption, Janner conducted an experiment by scratching the arm of an 8-year-old boy called James Phipps using material from a cowfox sore in one of these diary maids. Janner repeated the same experiment but this time with some added small amount of smallpox into the same child with the expectation of immunizing the same child from smallpox infection. The result proved positive (Jamo, 2016).

After 100 years, Louis Pasteur's experiment proved that disease could be prevented by infecting humans with weakened jams. In 1885, Pasteur successfully used vaccines to prevent rabbies. Jonas Saclk MD and Albert Sabin developed a polio vaccine. The discovery reduced child mortality worldwide. In 1991, polio virus was officially announced to have been eliminated from the U.S and countries in the Southern Hemisphere. In 1988, only one case of diphtheria was reported and no case was reported in 2000 (Jamo, 2017).

**History of Immunization in Nigeria**

Nigeria is a signatory to the declaration on the survival, protection of children as articulated at the 49$^{th}$ World Health Assembly in 1988 which was later reinforced by the world summit for children held in New York City in 1990. Among the declaration established at the summit were the challenges of global immunization (NPHCDA, 2009). In compliance with the summit agenda, the Nigerian government through the Federal Ministry of Health (FMH) made effort to pursue an active support on immunization program in the country.

The Expanded Program on Immunization (EPI) under the premises of WHO in Nigeria can be traced to 1979 and later restructured in 1997 so as to ensure effectiveness of immunization service delivery in the country. The main aim was to immunize 0-2 year old children (and pregnant women) and achieve above 85% coverage and to integrate immunization into routine activities of all PHCs. To reduce infant morbidity and mortality rate, immunization against preventable diseases including Tuberculosis, Poliomyelitis, Diphtheria, Tetanus, Measles and Whooping cough was given more emphasis. To ensure government commitment, the name was changed to National Program on Immunization (NPI) so as to nationalize the program and it became a parastatal under the Federal Ministry of Health established by decree 12 of 1997 (NPHDA, 2013).

In May 2007, NPI was merged with National Primary Health Care Development Agency (NPHCDA) and mandated with the task of controlling through the provision of vaccines and

immunization guidelines the occurrence of the following diseases: Tuberculosis, Poliomyelitis, Diptheria, Pertussis, Neonatal Tetanus, Measles, Yellow Fever, Hepatitis B, Haemophilus influenzae type Cerebro-Spinal Meningitis (CSM), Pneumococcus, Rotavirus, Human Papilloma Virus (HPV) and other vaccine-preventable diseases as epidemiological evidence may deem necessary (NPHDA, 2013).

The NPI scheme is implemented through the three tiers of government at the centre of the federal government managed policies and financed under the federal ministry of health (and WHO when there is outbreak of a disease). The federal government is also responsible for the provision of potent vaccines free to all Nigerian population at risk of preventable diseases through the NPHCDA and other tiers of government and stakeholders (NPHCDA, 2013). The state is saddled with coordination and supervision; whereas the LG is saddled with the real immunization service delivery because of their closeness to the grassroots citizen (Ahmad n.d).

At the centre there is a national coordinator with the assistance of sub-coordinators at states and LGs levels so as to ensure smooth implementation through communication channel for effective feedback. Although the program has not yet reached 100% coverage, there is remarkable improvement from 15% in 1979 to 80% in 2007, 95% in 2013 and 90% in 2018. The success in the Northern zones was due to the routine immunization and increasing women awareness on immunization program (Salako, and Oluwole, 2009; WHO and UNICEF, 2019).

**Previous Efforts Towards Immunization by the Government and NGOs**

In 1974 the World Health Organization (WHO) launched the Expanded Program on Immunization with the main goal of protecting children against childhood killer diseases by one year. The Nigerian government in compliance with that goal in 1979 initiated its EPI. The subsequent years (1980-1990) marked an era of remarkable progress in immunization coverage until the RI coverage started declining in the 1990s due to the collapse of the Primary Health Care system, poor funding by governments and lack of political commitment and ownership.

In 1996, Nigeria's EPI program was revitalized with a renewed government ownership and oversight which led to an increase in immunization coverage. Immunization surveys conducted in the country in 2003 and 2006 indicated poor coverage of all antigens below 50%.

Immunization services in Nigeria are usually delivered through two main strategies namely routine immunization (RI) and supplemental immunization activities (SIAs). RI is the regular provision of immunization services to infants through the administration of vaccines (antigens) in a scheduled plan program. The services are usually provided at fixed post at the community hospitals, clinics or health centres. SIAs are mass campaigns targeting all children in a defined age group with the objective of reaching a high proportion of susceptible individuals.

The National Health Policy provides free vaccines to all eligible age groups in Nigeria. It also provides supports to states and LGAs on immunization service delivery while establishing standards and guidelines for injection safety and waste disposal as well as cold chain and logistic managements. To achieve a wider coverage, the Nigerian government has also adopted series of approaches. These include: The Ward Heath System (WHS) and the Reaching Every Ward (REW) strategy, an adaptation of the WHO-AFRO Reaching Every District (RED) (Jamo, 2017).

**Religious Belief and Success of Immunization in Nigeria**

A number of studies have been conducted on correlation between success of immunization and religious belief (Anyene, 2014; Oku *et al*, 2016; Ojikutu, 2012; Dalhatu, 2015). For instance, Anyene (2014) indicates that religious belief is among the factors responsible for the failure of immunization in Nigeria due to the belief that OPV and other vaccines are part of western plot

to sterilize young girls and eliminate the Muslim population. This belief in Oku *et al* (2016) view could be curtailed through political support, engagement of traditional, religious institutions and the use of organised communication. Similarly, this is akin with Ojikutu's (2012) empirical study in Lagos state which shows that, though parents were aware of the importance of immunization, yet cultural belief supersede. The study further indicates that religion, marital status and education influence such belief. These findings are similar to Dalhatu (2015) study which shows that religious and cultural beliefs have significant impact on the success of immunization in Nigeria. On the contrary, Fatima, Rahji and Ndikom (2013) research in Moniya community in Ibadan Nigeria shows that, side effects, waiting time, number of visits, and attitude of health care workers were main the reasons for not immunizing their children rather than religious factor. This proved no connection between religious belief and success of immunization in Moniya community in Ibadan, Nigeria.

Equally, Adebayo (2014:51) research confirmed that both religion and cultural values have significant influence on people's attitude toward immunization in Nigeria. Similarly, Glatman-Freedman (2012) study indicates that immunization coverage was higher among Christians compared to Muslims population in Nigeria. The study also shows that mortality rate and poor western education awareness were found to be higher among Muslims than Christian population in the Middle East countries and African countries. The study further indicates that, social determinant factors affect success of immunization in both low and middle income countries (Glatman-Freedman and Nichols, 2012). These findings collaborate with that of Anyene (2014) which shows that religion alone is not the only determinant factor for success of immunization in Nigeria, other contributing factors include politics and culture. These findings were supported by Oku *et al* (2017) study of factors affecting immunization in Bauchi and Rivers states in Nigeria which identified political support; religious and traditional leaders as the main factors that facilitate communication activities. These studies indicate that there is connection between religious belief and success of immunization in the Northern Nigeria.

**Muslims' Perceptions on Immunization**

There are different perceptions among Muslims on immunization under the Islamic law. Some are of the view that immunization is permissible, while others question the rationality behind vaccination. For instance, Hamdan (2016) posited that US in 1950 recorded third lowest infant mortality rate in the world before involving on mass immunizations. But in 1995, US dropped to 23$^{rd}$ position after fully involved on mass vaccination. This means that mortality rate increases with immunization. The study further added that, immunity to disease is higher if acquired naturally and the possibility of re-infection is only 3.2%, compared to artificial immunity (vaccinations) with 80% chance of re-infection (Hamdan, 2016). Hamdan (2016) further revealed that:

> Many studies in the medical literature have documented vaccine failure. Measles, mumps, small pox, polio and Hib outbreaks have all occurred in vaccinated populations. In 1989, for example measles outbreaks occurred in schools with vaccination levels greater than 98% (Centres for Disease Control). The World Health Organization has actually found that a person who is vaccinated for measles has a 15 times greater likelihood of contracting the disease than a person who is not. The effectiveness of the whooping cough (pertussis) vaccine has been reported to be around 50%. In an incident in Kansas in 1986, 90% of pertussis cases were found to have been vaccinated. In another study of rubella, 36% of adolescent females who had been vaccinated against the disease lacked evidence of immunity by blood tests. Following the introduction of the diphtheria vaccine in various countries, incidents of the disease actually increased phenomenally. In France, there was a 30% increase;

> in Hungary, a 55% increase; and in Geneva, Switzerland, there was a tripling of the disease. All of this occurring after the introduction of mass compulsory vaccinations in those countries. In Australia, where vaccinations are not mandatory and only about ½ of the population receive them, the rates of illness are the same for both the vaccinated and non-vaccinated groups.

This indicates that immunizations are not as effective as people are made to believe and that a vaccinated person has no assurance or certainty that he will not contact the disease. These findings are in contrast with that of Salleh (2016) which observed that among the reasons for resistance to immunization among Muslims is the belief that immunization is part of the USA plot to depopulate Africa and that the oral polio vaccine was mixed with substances that could render girls infertile. It was also suspected that the oral polio vaccine (OPV) was extracted from the monkey tissue, rendering it forbidden (haram) to Muslims. The study further reveals that "the OPV is truly extracted from the tissue of monkeys but had been processed and transformed involving various levels of chemical and biological processes which made it lawful". The study further ascertained that no evidence found supporting the claim that the vaccine is used to depopulate the Muslim world. The population of Muslim countries that had adopted the OPV to eradicate polio has continued to grow at the same rate as it used to be before polio campaigns (Salleh, 2016).

Such suspicion is based on the claimed that the vaccines contain chemically dangerous substances that may harm the body. Among such allegations was that the vaccine is related to the development of autism in children. This argument was developed by Wakefield (1998) where he discovered that autism is linked to the combined measles-mumps-rubella (MMR) vaccine (Salleh, 2016). However, findings of the study were found to be not replicable (Salleh, 2016) and later retracted in 2010 from Lancet due to: (i) undeclared conflict of interest (ii) manipulated evidences (iii) breach of research ethics (Salleh, 2016).

Salleh (2016) further added that, succeessful investigations by Center for Disease Control (CDC) and Prevention, the American Academy of Pediatrics, Institute of Medicine of the US National Academy of Sciences, UK National Health Service and the Cochrane Library proved no evidence of correlation between MMR vaccine and autism. The study found that MMR is safe and effective in the prevention of diseases (Salleh, 2016; Chou, 2016).

Similarly, Bin Baaz in his Fataawa 6/21 (as cited in Salleh, 2016) posited that there is nothing wrong with giving treatment or medicine if there is the fear that the disease may occur because of the presence of an epidemic or other factors which may cause disease. Substantiating his position with the saying of the Prophet (PBUH) said, according to the saheeh hadeeth, "Whoever eats seven dates of Madeenah in the morning will not be harmed by witchcraft or poison." This indicates that there is nothing wrong if a person is vaccinated against the infection that is present in the land or elsewhere, because it is a kind of protection. He further explained that other side-effects or a short-lived fever as a result of immunizations may be overlooked when compared with the great harm that is warded off, specifically the diseases that may kill or cause great harm to a person's health (Salleh, 2016).

Similarly, Mufti of the Federal Territory in Bayan Linnas Series 59: Vaccine in the Perspective of Fiqh and Maqasid Shariah (as cited in Salleh, 2016) emphasizes the necessity of vaccination in diseases prevention as well as protection of public safety. He emphasizes that Islam prohibits the use of religiously forbidden things in medicine, but "in the event where there is no cure except the one that contains forbidden substance, Islam grants permission on the basis of emergency" (Dharurat). From this point of view, it is therefore according to him permissible to use vaccination to curb the spread of contagious disease. It is also permissible for Muslims to receive vaccines containing pork gelatin and to take medicine packaged in gelatin capsules,

since it has undergone transformation of pork products into gelatin and therefore alters them sufficiently to make it permissible. This position was supported by Dar alIfta' al-Misriyyah, Majma' al-Fiqh al-Islami, National Fatwa Committee Malaysia, Syeikh Abdul Aziz Bin Abdullah Bin Baz, Al-Syeikh Dr. Ali Jumaah. While Syeikh Dr. Yusuf al-Qaradhawi went further to highlighted that vaccination is *fardhu* (obligatory). This view is also held by the Union of African Muslim Scholar. Mohammed Ali al-Bar also in his work Ahkam al-Tadawi wa al-Halat al-Mai'us minha wa Qadiyyat Maut al-Rahmah noted that, constituted authorities have the right to mandate vaccination on people even without their consent for the greater good. This position is supported by hadith, "La Dhara wa La Dhirar" (Let there be no harm or reciprocating harm). Since vaccinations is aimed to activate immune system to fight contagious diseases it is therefore permissible, because any act to protect life is in line with maqasid shariah and upholds the spirit of al-wiqayah khairun min al- 'ilaj (prevention is better than cure). From the above submissions we can deduce that, there are two contending views about the legality and rationality of vaccination based on Islamic jurisprudence. While others are of the view that it is permissible in Islam, others perceived it as irrational (Salleh, 2016).

**National Policy on Immunization**

To provide adequate healthcare service to the people at the grassroots level, the government of Nigeria established national policy on immunization with the main aim of developing and promoting immunization program which is geared towards reduction of childhood morbidity and mortality through adequate immunization coverage of all at-risk population. In pursuance of this objective, the federal government in collaboration with other tiers of government pursued strategies to:

i. improve and sustain routine immunization coverage of all antigens to 90% by the year 2020 in line with the National vision.
ii. achieve through quality supplemental activities, interruption of polio transmission by the end of 2009 and total eradication by the end of 2013.
iii. eliminate mental and neo-natal tetanus by the end of 2010.

The Federal Government through the FMH in conjunction with NPHCDA shall also annually plan to detect, control and eliminate the occurrence of outbreaks of CSM, Measles, Yellow fever and any other VPDs in all parts of the country. To achieve these objectives, the national immunization policy categorized the following as targeted groups as eligible for immunization. They include:

i. Eligible children 0–11 months
ii. Eligible children 0-59 months
iii. Women of child bearing age 15–49 years
iv. Other at-risk groups especially in the out-break situations and those traveling to endemic areas.
iv. International travellers (Jamo, 2017).

**Immunization Resistance in Nigeria and some Countries**

Resistance to vaccination is not recent. It can be traced to the 18$^{th}$ century and has persisted up to present times in diverse forms in different countries. Criticisms against vaccination does not originate from Nigeria, it can be traced to England since when it was introduced in 1840. While Beck (1960) (as cited in Adebayo, 2014:51) posited that an organised movement against vaccination began in 1871. This led to promulgation of the compulsory act of 1873. This resistance was fuelled by mobilization of the public especially by the liberal reformers and members of a large and politically active working class. John Gibbs, later led the protest to the parliament in 1856. This reaction was supported by some clergymen and considered

immunization as unchristian. This scenario led to the division of scientific community into pro and anti-immunization. Those who opposed it include Benjamin Richardson and Edgar Crookshank (the first Professor of Bacteriology at King's College, London) (Adebayo, 2014:51).

In the United States, there were reactions against immunization during the last few decades of the 19th century and the early part of the 20th century. These reactions were mostly due to poorly performed vaccinations, ineffective vaccines and contamination by other microorganisms. The anti-vaccination movements were later supported by different individuals and organisations that differed in their beliefs, tactics and goals. These include the Anti-vaccination League of America formed in 1908 by two wealthy businessmen, John Pitcairn and Charles Higgins. Pitcairn, was an active member of the Swedenborgian church and whose son had earlier suffered an adverse reaction after being vaccinated. In addition to that, Christian Scientists which was initiated by Mary Eddy and which based on a belief that illness was a mental, rather than material phenomenon, and as such could be overcome through prayer. However, in 1901 Eddy pronounced her support to vaccination, but with prayers (Adebayo, 2014:51).

In spite of the US Supreme Court ruling (in the case of Jacobson vs. Massachusetts) in 1905 which affirmed the constitutionality of public vaccination stating that the need to protect the public outweighed individuals' right to privacy, yet the anti-vaccination campaign continued to persist. The court in 1922 again ruled that no constitutional right was infringed by excluding an unvaccinated child from school. In 1975 there were opposition against DTP in Japan which led to its suspension of the use of the vaccine where it was used. This was however, due to outbreak epidemic which led to about 40 deaths.

In 1998 controversy over a Measles Mumps Rubella (MMR) and Autism was reincarnated in United Kingdom by Dr Andrew Wakefield and colleagues following their report of a hypothesised link between autism and the MMR vaccine which led to significant drop in vaccine coverage (Burgess *et al*, 2006). This controversy was later felt in the USA, Australia and New Zealand. There were also reactions against vaccines in New Zealand, the UK and Sweden which found possible evidence in support of an association between asthma and whole cell pertussis vaccine which was later denounced by another longitudinal study in England which proved no correlation between DTP and asthma (DeStefano *et al*, 2002; Adebayo, 2014:51).

In Tanzania, UNICEF ESARO (2003, as cited in Adebayo, 2014:51) reported that, there were serious resistances against immunization. The agitations were based on the "rumour" circulated in the numerous reports and newspaper articles that the vaccines contained anti-fertility research. This agitation was earlier supported by Dr Birgitta Schnell, the medical director of a Catholic mission hospital, St Benedict's in Ndanda, who received and shared the information at a regional meeting in 1994 where she raised the issue of TT being laced with anti-BCG until later when she confirmed the purity of the vaccines. Similar opposition by the Muslim cleric in Kampala Uganda in 1996 that the OPV containing anti-fertility. This rumour was supported by Mulindwa Muwonge, of Central Broadcasting Service (CBS) radio and a radical group of Buganda youths called the Bazukulu. Muwonge campaigned on his radio station that OPV contained HIV. Similarly in Kenya, anti-vaccination campaigns in 1996 in the Central Province, in the diocese of Nyeri, Catholic priest, Bishop Nicodemus Kirima led a campaign against OPV. Subsequently similar church captains joined and supported him (Adebayo, 2014:51).

**Vaccination Resistance in Northern Nigeria**

In Nigeria, campaign against immunization was more pronounced in 2001 when some Islamic clerics had declared immunization as un-Islamic and urged Muslims to reject the exercise. Similarly in May 2002 the Kano state commissioner for health, Dr. Masur Kabir at a press conference expressed the position of the government remained that the vaccine did not contain the HIV/AIDS virus, nor a contraceptive, and was safe (Adebayo, 2014:51). But, Mohammed bin Uthman in his interview with the British Broadcasting Corporation (BBC), stressed that:

> the vaccine may have been responsible for the spread of AIDS in East Africa following a controversial book by journalist Edward Hooper, titled: "The River" which suggested that HIV was initially transmitted to humans in the late 1950s through the use of oral polio vaccine (Adebayo, 2014:51).

The cleric further pointed out that what had shaped his view in this regard was the scandalous field trial of the drug, Trovan by Pfizer in Kano in 1996 which led to the deaths and deformities of some children. Despite these reactions, other prominent Islamic leaders and Emirs were in support of immunization. For instance, the Emir of Gwandu, Alhaji Mailatu Bunu Gwandu, the Emir of Kazaure and the Supreme Council for Islamic Affairs were all confirmed the safety of the vaccine and shown their support to the immunization exercise (Adebayo, 2014).

What fuelled resistance to immunization in Nigeria was the 'rumour' of the death of 300 children following their immunisation with expired vaccines in the early 2003. In reaction to that, the government issued a statement denying such allegations (Adebayo, 2014).

In July 2003 the Supreme Council for Shari'ah in Nigeria (SCSN) and the Kaduna State Council of Imams and Ulamas at a news conference banned the vaccine, cautioning Muslims that "it is a plot by the Western world to reduce the population of Nigeria and other developing countries" (Madugba, 2003 in Adebayo, 2014). The statement which was signed by Sheik T. Suleiman of the Council of Ulamas and with Sheik Zubairu Sirajo of SCSN further reiterated that "Our doctors have conducted extensive research on this".

In August 2003, Kano state banned the use of OPV (BBC 2003) and followed by Zamfara State in October (Sabiu and Shobayo, 2003, Tribune, 27/10/2003). This was subsequently followed by media campaign by a renowned paediatrician and a president of the SCSN,Dr Datti Ahmed (BBC, 2003). He further highlighted that his position was based on several e-mails he received "confirming the contamination of the vaccines with antifertility agents, HIV/AIDS and cancer", but his opposition was limited to the oral polio vaccine. On the contrary, Sheikh Yusuf Al-Qaradawi said "the vaccine was lawful and blamed the SCSN for creating a negative image of Islam showing it to contradict medical progress" (Adebayo, 2014:51).

However a joint statement by the World Health Organisation, the Federal Ministry of Health, National Agency for Food and Drug Administration and Control (NAFDAC) and UNICEF falsified the American link and also reassuring that most of the vaccines were imported from Indonesia and Malaysia, both Muslim countries. They also referred to a test carried out by a Muslim pathologist at the Ahmadu Bello University Zaria, Dr Abdulmumini Rafindadi at the request of the Katsina State branch of the SCSN which found the drug to be free of anti-fertility hormones. Another independent panel of experts headed by Professor Umaru Shehu was set up by the federal government and reported in December 2003 that the vaccine was safe (Adebayo, 2014:51).

On the contrary, a pharmacologist and a lecturer at Bayero University, Dr Lawal Hassan Bichi affirmed before Nigeria's House of Representatives, that the results of their tests indicated that

the vaccine "contained some elements capable of impacting negatively on fertility as well as the causative agents of HIV/AIDS" (Adebayo, 2014).

Again, another test ordered by the Jama'atu Nasril Islam (JNI) and conducted in India by Professor Haruna Kaita, the then Dean of the Faculty of Pharmaceutical Sciences of the Ahmadu Bello University Zaria, reported "undeclared contaminants which could cause malfunctions of the testes in males and cause infertility in women" (Adebayo, 2014).

In June 2004, the Minister of Health, Professor Eyitayo Lambo informed the public that the Kano State government had accepted the potency of the OPV produced in Indonesia. Abdullahi Saleh Pakistan informed the public that "from what we were told at the meeting, the polio vaccine to infertility ratio had been exaggerated.". However, on the 31st, July, 2004 the Kano state government resumed the use of OPV when the state governor administered the vaccine to babies in the state (Adebayo, 2014). This indicates that there are divergent views on the safety of OPV.

**Result of the Findings**

This study was aimed at exploring public perceptions on immunization in Nigeria. The study indicated that resistance to immunization is not recent, rather it started since the introduction of modern immunization in England in 1840 and later supported by some clergymen who labelled immunization as unchristian. The discovery of immunization was accompanied with different criticisms as well as vehement resistance first by the medical professionals, academics as well as scientific communities into pro and anti-immunization. This reaction engulfed U.S in the late 19$^{th}$ and early 20$^{th}$ centuries and subsequently to Africa. In Nigeria resistance to immunization became more pronounced in 2001.

Among the major reasons labelled against immunization is that the polio vaccine was mixed with substances that could render girls infertile, as part of the USA plot to depopulate Africa. It was also alleged that the oral polio vaccine (OPV) was extracted from the monkey tissue, rendering it forbidden (haram) to Muslims. Other glaring factors include that the vaccines contained substance capable of causing AIDS and deformation among men.

The study also reveals that the OPV is truly extracted from the tissue of monkeys but it had been processed and transformed involving various levels of chemical and biological processes which made it lawful and no evidence found supporting the claim that the vaccine is used to depopulate the Muslim world.

The study also proved that though resistance to immunization is not only to Muslim faith, rather it cut across different faiths. In recent times, the agitations have been more pronounce in the Muslim countries and communities. The most recent resistance were in the northern Nigeria where the predominant inhabitants of the region are Muslims. It has also been observed that, immunization in the northern Nigeria has divided scientific communities, religious leaders, politicians as well as the general public into pro and anti-immunization program. Though some have little bit subsided from their positions and there are improvement in recent years, it is quite clear that many people are yet to be convinced on the safety of vaccines in Nigeria.

The study found that there is conception that, immunization is a preventive mechanism and that oral polio vaccine is safe and there is no evidence supporting the claim that it is a plot to depopulate Muslim countries of the world. This claim is more of propaganda that has no substantial evidence to support it.

The study also proved that while there are still religious clerics and scientific communities who are yet to be convinced about the safety of OPV and other vaccines, there are a number of clerics and medical professionals in the field of science who are confident about the safety of the vaccines.

## Conclusion

The resistance to immunization is not recent, but started from the developed world where the modern vaccine was first discovered and later spread to developing countries including Nigeria. Thus in spite of the recent achievements recorded, vaccine preventable diseases still remained a challenge for effective healthcare service delivery in Nigeria. This would probably continue in the Northern Nigeria depending on the level of public awareness on the importance of immunization and government commitment to involve both religious clerics and scientific communities toward eradicating vaccine preventable diseases. Hence, the success or failure of immunization in Nigeria depends largely on public awareness and the level of government commitment to provide vaccines which are produce within the country or Muslim countries.

## Recommendations

The study recommended the following:

i. More adequate public sensitization on the importance of immunization should be given sufficient attention.
ii. Provision of more reliable vaccines to Nigerians, this to a large extent would reduce the fears attributed to immunization.
iii. Further researches should be undertaken on immunization safety.

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