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## RESEARCH ARTICLE

## NIGERIA ON THE VERGE OF POLIO ERADICATION

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Polio eradication is a very sensitive exercise and has remained intractable yet achievable. A number of innovations, concerted efforts, strategies and modalities have been developed and implemented to expunge polio from the world, yet Nigeria, Pakistan and Afghanistan have still not eradicated indigenous cases of polio. In this article, we give an exposition of Global Polio Eradication Initiatives with focus on how Nigeria is scaling up local innovations towards immunizing children is yielding positive results with drastic fall in the number of Wild Polio Virus (WPV) cases from 49 in 19 States of the federation in 2013 to 6 cases in 2 States in 2014 and the improvement in lot quality assurance survey (LQAS) from less than 80% to over 80% threshold for the same period.

We highlighted a number of innovations that are gear toward the attainment of the GPEI goal and the need to adopt the Polio Emergency Operations Center (EOC) model of polio eradication to other vaccine preventable diseases (VPD) in the control and prevention of other epidemic.

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**Polio: causes, transmission and prevention:-**

Poliomyelitis is a crippling and potentially deadly infectious disease [1]. The word polio (grey) and myelon (narrow, indicating the spinal cord) are derived from Greek [2]. It is the effect of poliomyelitis virus on the spinal cord that leads to the classic manifestation of paralysis [2].

The virus enters through the mouth, and primary multiplication of the virus occurs at the site of implantation in the pharynx and gastrointestinal tract. The virus usually present in the throat and in the stool before the onset of illness. One week after onset there are fewer viruses in the throat, but the virus continues to be excreted in the stool for several weeks. The virus invades local lymphoid tissue, enters the blood stream and then may infect cells of central nervous system. Replication of poliovirus in the motor neuron of the anterior horn and brain stem results in the cell destruction and causes the typical manifestation of poliomyelitis. The incubation period for poliomyelitis is commonly 6 to 20 days with a range of 3 to 35 days [2].

There are three poliovirus serotypes (WPV1, WPV2 and WPV3). There is minimal heterotypic immunity between the three serotypes. That is immunity to one serotype does not produce significant immunity to the other serotypes [2]. Polio only infects humans. It is very contagious and spread through person-to-person contact, with seroconversion rates among susceptible household contacts of children nearly 100%, greater than 90% among susceptible household contacts of adults [1, 2].

An infected person may spread the virus to others immediately before and about 1 to 2 weeks after symptoms appear. The virus can live in an infected person's faeces for many weeks. It can contaminate food and water in unsanitary conditions. Infected people who don't have symptoms can still pass the virus to others and make them sick [1].

Polio vaccine protects children by preparing their bodies to fight poliovirus. Almost all children (99 out of 100) who get all recommended doses of vaccine will be protected from polio [1]. There are two types of vaccines that can prevent polio. These are inactivated polio vaccine (IPV) and oral poliovirus vaccine (OPV) [1]. In 2014 IPV was introduced in some selected high risk Local Government Areas/Districts in Yobe, Borno and Kano States during special and modified supplementary Immunization Activities (SIAs), and in routine immunization across the country in January 2015.

#### **An Overview of Global Polio Eradication Initiative (GPEI):-**

The maximum benefit of GPEI will only be achieved when immunization against poliovirus will no longer be required. Prior to stopping immunization, it will be necessary to certify countries in the world. A strategic plan has been designed by GPEI in consultation with national health authorities, a directive of the World Health Assembly (WHA). The polio eradication and endgame strategic plan 2013-2018 has four main objectives: detect and interrupt all polio virus transmission; strengthen immunization systems and withdrawal of oral polio vaccine; contain poliovirus and certify interruption of transmission; and polio's legacy. Along with attaining high routine vaccination coverage rate, conducting National Immunization Days (NIDs) and adopting "mopping up" immunization, acute flaccid paralysis (AFP) surveillance is essential strategy of GPEI [4-7].

#### **Domestication of GPEI strategies and scaling up local innovations in Nigeria:-**

One of the greatest strengths of the program in Nigeria is the commitment of political, traditional and religious leaders through the Presidential Task Force on Polio Eradication and Emergency Operations Center (EOC) [8].

The EOC which is the operating arm of the Presidential Taskforce on polio has been the lynchpin of the efforts towards polio eradication. The EOC is made up of experts from the Federal /State government and development partners (WHO, UNICEF, Center for Disease Control, Rotary Polio plus) has been the cauldron where responses to challenges are hatched and new challenges are anticipated and proactively acted upon to stem any obstacle on the path of the program [6]. For the last decade, Nigeria has been the only African country with endemic polio infection, responsible for infecting 26 other countries p many of them repeatedly. Nigeria, the Africa continent's last polio reservoir has greatly strengthened its programme over the last 2 years through successive innovations which have substantially reduced the number of children missed by vaccinators, and so increased population immunity to polio [9].

In 2014, the Polio Emergency Center (EOC) identified the following strategic priorities for 2014 National Polio Eradication Emergency Plan (NPEEP) after consultation with immunization partners and local stakeholders to include: improving immunization plus days (IPDs) quality in persistent poor performing Local Government Areas/Wards; increase reach of children with Oral Polio Vaccine (OPV) in the security compromised areas; rapidly containing circulation in the breakthrough Polio transmission zones; mounting timely and adequate polio outbreak responses; reaching children in underserved populations; intensifying communication and demand creation; boosting child immunity in-between rounds in polio free States; optimizing human resources; and stricter implementation of the accountability framework [10].

The National EOC also identified the insecurity situation on Borno and Yobe as one of the major threats to interrupting polio transmission in Nigeria in 2014. The priorities for the Borno and Yobe Emergency Plan in the first 7 months of 2014 include: increasing reach of children with OPV in the insecurity inaccessible Local Government Areas, wards and settlements once window of opportunity arises; mounting timely and adequate mop-up responses to any polio outbreak response; improving overall quality of Supplementary Immunization Activities (SIAs) and mop-ups including cross-border synchronized activities; reaching children in hard to reach settlements migrant/nomadic population, borders and underserved populations; intensifying surveillance; expanding technology/innovations to further improve quality of rounds; intensifying mobilization and demand creation; introduction of inactivated polio vaccine (IPV); optimizing human resources and stricter implementation of accountability framework [11].

Yobe which is one of the security compromised State with one confirmed Wild Polio Virus case in 2014 accounts for 17% of Polio cases compared to 2013 when both Yobe and Borno States accounts for 54% of total polio cases [11]. As part of effort to stem out polio from Nigeria, IPV was implemented in the 2 States. The coverage of the IPV-campaign in Yobe and Borno States are 105% and 91% respectively. Similarly, 889 health camps were used to cover 69 (30%) wards in Yobe State and 2,214 health camps were used to cover 256 (82%) wards in Borno State [12].

#### **A Snapshot of Nigeria Polio Status:-**

The polio status of Nigeria as at 22<sup>nd</sup> September, 2014 includes [13]:

1. 88% reduction in WPV1 with 6 confirmed cases in 2 states (Yobe and Kano) compared to 49 cases in 9 states for the same period in 2013.
2. 23 months of no confirmed WPV3. Latest onset was in November 2012.
3. 19 confirmed vaccine derived poliovirus (cVDPV) in 2 States (Yobe and Kano) compared to 2 cases in 2013 for the same period.
4. 87% reduction in circulating genetic cluster. One in 2014 compare to 8 in 2012.

#### **Conclusion:-**

As all indicators for Polio eradication points towards interruption of the virus, it is suggested that all stakeholders do not rest on their oars to ensure absolute interruption. The strategies adopted by the Polio Emergency Operations Center (EOC) have narrowed the virus to two (Yobe and Kano) out of the 36 states of the federation and surveillance has been intensified with number of AFP cases on the increase.

As the match toward interruption of polio from Nigeria entered its critical stage, expectations are high and all stakeholders are working round the clock to hasten the attainment of Global Polio Eradication Initiative goal with results driven innovations and strategies. In 2014, Nigeria was able to eradicate Ebola with number of personnel and infrastructure drawn from the polio program, therefore, a polio free Nigeria is achievable.

Since the EOC model for polio eradication has been successfully adopted in the expulsion of Ebola from Nigeria, it is therefore recommended that the EOC model for polio eradication be used with modification where necessary to eradicate, control and prevent other disease (outbreaks).

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