Nigeria's Bumpy Road Towards Polio Eradication: Review Article

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***Abstract*—Through the Global Polio Eradication Initiative (GPEI), the burden of polio has been reduced by more than 99%. However, polio remains endemic in three countries including Nigeria.**

Nigeria witnessed a setback in its effort to eradicate polio in 2016 with detection of four cases of Wild Poliovirus (WPV) after nearly two years without any WPV. Aggressive and effective outbreak response by the government ensured restriction of the spread of the virus and as a result, the last case of WPV in the country had a date of onset of paralysis on 21st August 2016.

Nigeria is on its way once again to eradicate polio for good. The main issues hampering eradication efforts in Nigeria relate to insecurity, weak routine immunization, weak accountability, lack of trust and misconceptions. Polio eradication is achievable in Nigeria since the most technically-challenging place to eradicate polio, India, has achieved this feat in 2014. Everywhere is at risk until polio is eradicated everywhere. This calls for concerted efforts including innovations and use of technology to ensure that all remaining unreached areas in the country are accessed and served with immunization services. In addition, surveillance reach should also extend to all areas to ensure that no area of poliovirus transmission is missed.

Method

This article was produced through pertinent literature review of both published and unpublished information, GPEI documents and reports as well as surveillance data at the WHO country office, Nigeria. The literature was selected using such search words as 'polio eradication in Nigeria', 'progress in polio eradication' and 'challenges in polio eradication'. Only literature published with relevant contents and in conformity to the theme of the review were accepted. In addition, only literature published in English Language and published after the year 2000 was considered.

Keywords—Poliomyelitis, Polio, Eradication, Immunization, Wild Poliovirus.

Introduction

The Global Polio Eradication Initiative which started in 1988 has achieved a lot in terms of reduction in the number of WPV cases from 350,000 estimated cases in 1988 to less than 40 and from 125 polio endemic countries to just three (Afghanistan, Nigeria and Pakistan) in 2018[1]. In addition, WPV type 2 has been declared eradicated in September 2015 and the last time WPV type 3 was confirmed was in November 2012 in Nigeria[2]. As a result of GPEI, 10 million people are now able to walk today who would have been paralyzed by the disease[3].

The GPEI is unarguably the largest global public-private partnership public health intervention in history[4]. The partnership is led by national governments and spearheaded by WHO, Rotary International, the US Centers for Disease Control and Prevention (CDC) and UNICEF. The GPEI is now supported by other key partners such as the Bill & Melinda Gates Foundation (BMGF)[5]. The ultimate goal of GPEI is to complete the eradication and containment of all wild, vaccine-related and Sabin polioviruses, such that no child ever again suffers paralytic poliomyelitis[6]. If polio is eradicated, it would be the second time (after smallpox) in history that a disease affecting humans has been eradicated[7]. Apart from getting rid of the disease and creating significant momentum for other public health initiatives, polio eradication also makes economic sense. A polio-free world will reap financial savings and reduce healthcare costs by up to $50 billion through 2035. It has been estimated that GPEI has already saved $27 billion since its launch in 1988. Low-income countries account for 85% of GPEI global savings in addition to incalculable alleviation of human suffering[8,9]. Failure to eradicate Polio will on the other hand allow the disease to continue claiming victims and to spread to other polio-free countries. It has been estimated that that if eradication goal is dropped, as much as 35 million polio infections could occur annually resulting in 175,000 cases of paralysis[10]. In addition, the sum of $1billion is required to maintain momentum for each year that the goal of eradication is missed[11]. The world is now in an emergency mode of polio eradication with the declaration by WHO in 2012 to the effect that finishing the task of polio eradication was a Public Health Emergency of International Concern (PHEIC)[12]. This declaration led to the development of series of polio endgame strategic plans that not only aim to deliver a polio-free world,

but also reposition polio 'assets' to be used to address other health priorities. After reviewing the data on WPV1 and circulating vaccine derived polioviruses (cVDPV), the eighteenth meeting of the Emergency Committee under the International Health Regulations (IHR,2005) concluded that the risk of international spread of poliovirus remains a Public Health Emergency of International Concern (PHEIC), and recommended the extension of Temporary Recommendations for a further three months[13].

Poliomyelitis

Poliomyelitis is a highly infectious, preventable viral disease that is caused by WPV, a member of the family picornaviridae. Poliomyelitis has been known for at least 3000 years. Depictions of its invalidating effect have been discovered in Egyptian Frescos. The disease is contracted mainly through faeco-oral route. The virus multiplies in the intestines, invades the lymph nodes or sometimes enters the bloodstream where it persists to cause viremia. In majority of cases (99%), clinical disease does not result while in minority of cases (1%) it enters the central nervous system where it causes irreversible floppy paralysis. In rare cases, the disease may cause death[14]. There are 3 sero-types of poliovirus, namely wild poliovirus types 1,2 and 3. Types 2 and 3 were last reported in 1999 and 2012 respectively. Since 2012, all WPV cases reported worldwide are of type 1 only, which is the most neuro-virulent of the three sero-types of wild poliovirus strains[15]. The incubation period of poliomyelitis is usually 7-21 days with a range of 3-35 days[16]. Although polio can infect a person of any age, children five and under are especially vulnerable and make up the majority of polio victims. In terms of risk of infection, the earlier the age, the more is the risk. Other risk situations include populations with low immunization, poor sanitation and hygiene, endemic countries and countries with outbreaks. Although only about 1 in 200 polio infections results in paralysis, the risk of paralysis is increased with strenuous exercise, pregnancy, tonsillectomy and trauma. Provocation poliomyelitis is the phenomenon of poliomyelitis resulting from physical trauma during infection with poliovirus. This phenomenon, of provocation poliomyelitis continues to cause numerous cases of childhood paralysis due to the administration of unnecessary injections to children in areas where poliovirus is endemic[17]. There is no cure for polio; treatment is mainly supportive and is aimed at alleviating or reducing the patient's symptoms. Most cases of paralysis will end up with residual paralysis and varying degree of disability for life. Polio case fatality is around 2-5%[18].

The bumpy road towards polio eradication in Nigeria

In terms of polio, Nigeria has made headlines for all the wrong reasons. Few of such major headlines include the boycott of polio vaccination in Kano for up to 11 months and suspension of polio vaccination in other northern states such as Zamfara and Kaduna[19-21]. This boycott resulted in increase of polio cases and spread of the disease in the population and constituted the reinfection of 20 other free polio countries[22]. High rates of vaccine refusals especially in the northern states were legendary. Some of the key reasons put forward for polio vaccine refusals and boycott relate to fears propagated by Muslim radicals that mass vaccinations were part of a western plot to curb population growth by making people infertile and spreading HIV. There was also the issue of lack of infrastructure in some areas as well as the issue of too many rounds of polio campaigns against the 'few' polio cases leading to caregiver fatigue. Other radicals expanded the scope of the misconception and related it to the 1996 Pfizer Meningitis study in Nigeria and the distrust of 'western interventions' post 9/11[23,24]. Vaccination team performance at one time was at its lowest ebb. Some vaccination teams were found to connive with non-compliant caregivers to mark the fingers of their children as evidence of vaccination, but without actually giving the vaccine to those children[25,26]. Many vaccination team members paid the ultimate price in the course of discharging their duties. Boko Haram insurgents killed many of the vaccination team members in Kano and Borno[27,28]. The population immunity in Nigeria, especially in the high risk northern states has continued to be low due to low routine immunization performance and this situation makes it more difficult to sustain the gains achieved through supplemental immunization camapigns[29-31]. In 2012, of the total 223 global WPV cases, Nigeria accounted for more than half (122)[32]. In addition, the Independent Monitoring Board (IMB) of the GPEI in one of its report of 2012 described certain areas of the globe as polio 'sanctuaries' of which Nigeria (Kano, Sokoto-Kebbi and Borno) was one. Polio 'sanctuaries' were described as places where the virus persists, hides and thrives[33].

Despite all the challenges faced by the country in its efforts to eradicate polio, Nigeria remained resolute and undeterred such that by September 2015, the country was removed from the list of polio endemic countries by WHO[34]. It was a shock to Nigeria and indeed the global polio committee when in 2016, polio again reared its ugly head in the security challenged state of Borno resulting in the confirmation of four WPV cases and the subsequent relisting of the country as polio endemic[35].The Government of Nigeria declared the outbreak as national public health emergency and immediately launched an aggressive outbreak response, conducting

several rounds of supplementary immunization activities and strengthening of surveillance.

Nigeria is now on course once again towards achieving a lasting eradication. The last case of WPV had a date of onset of paralysis on 21st August 2016. Several factors contributed to the current success including the much improved population immunity, high surveillance sensitivity, access to trapped populations, innovation, use of technology, better

coordination, accountability; and government committement[36-38].

The setback in 2016 underscores the risk posed by low-level undetected poliovirus transmission in the inaccessible areas due to Boko haram insurgency and brings to the fore the issue of strengthening surveillance in all areas and the role of insecurity as the greatest impediment to achieving polio eradication in Nigeria[39-40].

The successes recorded in interruption of WPV transmission notwithstanding, the country in 2018 witnessed an intense transmission of Vaccine Derived Poliovirus (cVDPV2) type 2. A total of 141 cVDPV2 and 9 aVDPV2 were confirmed from environmental samples, Acute Flaccid Paralysis (AFP) cases, AFP contacts and Healthy Children in 31 Local Government Areas (LGAs) of 12 states of the country.

Recommendations

It is strongly believed that for polio eradication to be actualized, there has to be strong political commitment at the highest level. Thus the Presidential Task Force on Polio Eradication (PTFoPE) has to be functional at all times to galvanize the support of political, traditional and religious leaders as well as the security personnel including the military to take on the task of eradicating polio. This level of governmental engagement at the highest level will also esure accountability and timely realization of financial commitment at all levels.

Efforts should be geared towards strengthening of routine immunization especially in the areas of demand creation, improving access and supervision. A strong routine immunization is vital for sustaining the gains so far achieved in our eradication efforts and will also contribute towards reducing the burden of other vaccine preventable diseases.

The quality of polio vaccination campaigns should be improved through training of vaccination teams, supervision and monitoring as well as through other tailored strategies such that all eligible children are reached with polio vaccines. The public should be continuously sensitized to appreciate the value of immunization and propaganda campaigns against vaccinations should be effectively countered. Partnership with communities, security personnel including the military and civilian joint task forces should be strengthened to ensure that immunization and surveillance activities reach trapped populations in the insecure areas.

Surveillance should be intensified to be able to detect all remaining areas of poliovirus transmission should such exist. It is imperative to intensify active surveillance, training of surveillance personnel, community and clinician sensitization and expansion of reporting network, especially that of community informants. Environmental surveillance should also be strengthened and expanded depending on laboratory capacity and poliovirus epidemiology.

It is also recommended that the programme continue to implement innovations that have proven to be effective and utilize information technology to improve performance.

A lot has to be done to reach migratory, nomadic and other underserved children as well as children living in security compromised and hard-to-reach areas with vaccination, surveillance and other health care interventions. Accessing these children will require determination and specific tailored strategies depending on the peculiarities of these areas.

Conclusion

Nigeria is finally on its way towards achieving a lasting polio eradication after a difficult and lengthy journey characterized by vaccine refusals and boycott, poor vaccination team performance, insecurity, low routine immunization performance and weak accountability among others. Nigeria has been able to reach this far through dogged determination of the government and partners that ensured quality surveillance as well as improvement in population immunity.

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