

Mini Review on “Winning the battle against the scourge of poliomyelitis in the African Region”

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ABSTRACT

This mini review on my previous article entitled, ‘Winning the battle against the scourge of poliomyelitis in the African Region’ published in *Vaccine* 34 (2016) 5142–5143 takes another look at the optimism expressed in that article about the success in eradicating poliomyelitis (Polio) from the African Region. Polio is a deadly and painful disease that afflicts mostly children less than 5 years. The struggle to eradicate it and get the African Region polio-free has been tortuous. The struggle has been protracted with a series of public health emergencies and political strife compromising the efforts of global partnership comprising of WHO and its key partners such as the United Nations Children’s Fund, the United States Centres for Disease Control and Prevention, Rotary International, and Bill and Melinda Gates Foundation, among others, as well as other stakeholders and national governments in the African Region. In a renewed effort, the partnership generated a huge amount of resources and skills deployed to interrupt polio transmission in the Region. For the first time since the struggle began in the early 80s, the Region reported no wild polio virus for two years. However, the recent success of the military campaign in Northeast Nigeria brought to the open the realities of reservoirs of transmission isolated in security compromised areas. Thus, after two years new cases of wild polio virus were reported in previously unreachable areas. The lesson here is in understanding the impact of political activities on the realization of health for all in our Region.

Introduction

Winning the battle against the scourge of poliomyelitis in the African Region published by Matshidiso Moeti in *Vaccine* 34 (2016) 5142–5143¹ expressed a cautious optimism on the success recorded in the protracted struggle to eradicate poliomyelitis (Polio) from the African Region. Polio is a highly infectious disease caused by polioviruses, of which there are three, types 1, 2 and 3. The disease can also be caused by vaccine derived poliovirus. Though, it can strike at any age, it affects mainly children under five^{2,3}. The virus attacks the nervous system, and causes irreversible paralysis of mainly one of the lower limbs in one out of about 200 infected persons⁴. Poliovirus spreads from person to person, and both paralytic and asymptomatic infected persons are capable of spreading the infection. Thus, a single confirmed case of paralytic polio is considered to be an evidence of outbreak.

Some successes were recorded in eradicating the disease in the African Region. However, the need to sustain the struggle against poliovirus transmission prompted my article “winning the battle against the scourge of poliomyelitis in the African Region. Given

the detection of new cases since the second half of 2016, following the liberation of hitherto security isolated communities in Northeast Nigeria, it has become necessary to present update of the perspective reflected in this mini review.

Efforts to eradicate polio in the African Region

For more than more than two decades, polio constituted an intractable challenge to global public health and indeed the African Region. It was endemic in most countries in the African Region in the 1990s, with 12,000 cases reported each year in the Region^{5,6}. The virus was resilient and intimidating. In 2008, the World Health Assembly (WHA) passed a declaration of polio eradication as a public health emergency. The fortunes of the virus began to change, as a new global and local impetus to fight the disease was launched. A global partnership comprising of WHO and its key partners such as the United Nations Children's Fund, the United States Center for Disease Control and Prevention, Rotary International, and Bill and Melinda Gates Foundation, among others), as well as other stakeholders and national governments in the African Region generated enormous human, financial and material resources committed to polio eradication. The Global Polio Eradication Initiative (GPEI) strategies, namely strengthening immunization systems to ensure high coverage with polio vaccines through routine childhood immunization, robust surveillance for acute flaccid paralysis (AFP), supplementary immunization, and "mop-up" immunizations were intensified to make progress.

These efforts culminated in drastic reduction of wild poliovirus cases and potential for the interruption of transmission within target time. Only 6 cases were recorded by July 2014. Two years passed since July 2014 without confirmation of wild poliovirus cases in the African Region. This was a tremendous achievement. The article under review attributed the success to a number of factors including strategic intensification in the implementation of the traditional GPEI strategies and garnished with a number of local innovations on the part of highly committed and courageous field personnel, who devised techniques for reaching the populations in difficult and security compromised terrains. The publication by Moeti also acknowledged the contributions of strong leadership and commitments of national governments, traditional and community leaders who deployed the indigenous knowledge of their people to promote polio eradication friendly behaviors and accept the vaccination of infants and children with the oral poliovirus vaccines where hitherto it was rejected¹.

However, this celebration of success was cut short by the recent detection of an ongoing outbreak of type 1 wild poliovirus (WPV1) in Nigeria. Four cases of WPV1 have been reported in Borno State, Nigeria since July 2016, exactly two years since the last WPV1 cases were reported in the Region. The detection occurred in an area that had

been completely inaccessible due to terrorists' control of that part of the country. The latest onset of WPV1 was on 21 August 2016. Additionally, the Region continued to experience cases of circulating vaccine derived polio virus type 2 (cVDPV2). There have also been emerging cases of VDPVs after the tOPV/bOPV switch in the Region. Although these outbreaks threaten to reverse the success story chronicled in the article¹, in response to the poliovirus circulation in Nigeria, a Lake Chad Basin Polio Coordination Task Team was quickly put in place to ensure synchronized cross-border outbreak responses. The Ministers of Health of the countries around the Lake Chad Basin (Nigeria, Cameroon, Central African Republic, Chad and Niger) declared the polio outbreak in Nigeria a sub-regional public health emergency in August 2016. These efforts are in place to quickly stop the resurgence of polio and avoid international spread.

Innovations that contributed to the success and their limitations

The successes of polio eradication in the African Region are hinged strategically on strengthening immunizations, conducting active surveillance to quickly detect any poliovirus circulation and the use of innovations in responding to outbreaks⁷. Special approaches were adopted in security compromised areas. Some of the innovations included partnership with institutions like the military in reaching the unreached and populations in difficult and security compromised terrains⁸. In Nigeria, the government created polio emergency operation centers (EOCs) at the national level and selected States from where the implementation of national and state polio emergency action plans to interrupt polio transmission were coordinated⁹. Poliovirus transmission in the Region and beyond was at some point driven by reservoirs or sanctuaries in northern Nigeria, where poliovirus transmission continued and periodically infected states that had interrupted transmission. These states had security challenges and in some cases deliberate rejection of the vaccine by anti-vaccine campaigners¹⁰. Given the challenges and the need to reach the targets, new innovations had to be tried and perfected to solve complex problems that revolved around the community accepting many rounds of oral polio vaccination¹⁰.

Some of the innovations include tracking of vaccination teams through GIS and re-visiting and vaccinating children in poorly accessed areas, engaging and using journalists to improve acceptance of polio vaccination in northern Nigeria, through the Journalists Initiatives on Immunization Against Polio; engagement of the youth in support of polio vaccination in noncompliant communities in Kaduna during SIAs and the implementation of a systematic accountability framework in 2014 to improve the performance of staff and of the Nigerian Polio Program¹¹⁻¹⁵. These innovations

became necessary to confront the numerous specific behavioral and geopolitical obstacles confronting efforts at stopping transmission of the poliovirus. Innovations are good in certain parts and at certain times depending heavily on a number of critical internal actors, and on external capacities and resources¹⁶. Another concern with innovations in emergency mode includes impediments that may be due to institutional barriers to change given a dearth in resources or capacity. Worse still, humanitarian health innovations have been found to be largely based on a trickle down model. Drawing innovation from other contexts, and not indigenous to the populations¹⁷.

The ability to optimally execute the innovations was compromised by insecurity, restricting the movement of the teams deployed in some states in Northern Nigeria. Even though the innovations were locally “home-grown” by capable and experienced personnel in hostile conditions who were deployed by government and partners in hardest places, security changes hampered the full implementation of the innovations. It is important to understand that the crisis here was not a conventional crisis or war, so the conditions were unpredictable and resulted in loss of some committed health workers. As such, the strategies were not systematically done geographically, leaving out some localized unreached areas that, though with relatively smaller populations, became reservoirs of the virus. As hindsight, it is therefore no surprise that the recent outbreak occurred. To some extent, the astonishment this caused to the GPEI raises questions on the sensitivity of AFP surveillance in the inaccessible areas, which the team managed to implement in some of these places.

Discussion

Despite the limitations of the article, ‘winning the battle against the scourge of poliomyelitis in the African Region’ published in *Vaccine* 34 (2016) 5142–5143, it is important to note that the author clearly outlined the necessary conditions for real success in the struggle to eradicate polio in the Region. In the concluding section of the article on page 5143, the author emphasized that “while the battle against the scourge of poliomyelitis seems won, the war still has to be won. There is need for vigilance and guarding of the seeming victory until the Region is certified polio free later in 2017, and the world also certified polio free in the near future”.

More important is the need to reiterate the conclusions of the modeling efforts that shows expected decline in global population immunity to serotype 2 transmission after the tOPV/bOPV switch, regardless of the of IPV use. The model warns that the risk of cVDPV outbreaks after OPV cessation of any serotype will depend on the serotype-specific population immunity to transmission prior to its cessation. Further the model noted that successful management of the risk will require serotype-specific OPV SIAs to be

conducted in such risk prone areas before OPV cessation¹⁸. This calls for additional doses of the vaccine.

It also flags the urgency of controlling the two independent cVDPV2 outbreaks in Nigeria to avoid a spread across Africa and eventually force the re-introduction of OPV containing serotype 2. A continued circulation of cVDPV2 poses a more serious threat to the African continent than WPV1 partly because bOPV containing serotype 1 continues in all the countries while OPV containing serotype 2 has stopped. This situation is worsened by the current IPV shortage. The implication of a continued transmission of cVDPV2 is that children born after the tOPV/bOPV switch will be left unprotected from cVDPV2 transmission as well as exposed to paralytic polio if infected.

Moreover, despite the limitations, using best practices and innovation from one disease and condition has proven very successful in stopping the Ebola outbreak. The best practices in polio eradication were effectively deployed to stop Ebola transmission in West Africa. According to Vaz et al “the support from the polio program infrastructure, particularly the coordination mechanism adopted by the Ebola Emergency Operations Centre (the EEOC), the availability of skilled personnel in the polio program, and lessons learned from managing the polio eradication program greatly contributed to the speedy containment of the 2014 Ebola virus disease (EVD) outbreak in Nigeria”¹⁹.

It is also important to note that the recent reported cases of WPV1 were concentrated in an area, which for a long time was occupied by terrorists in the northeastern part of Nigeria. For a long time, no services could reach the populations in these localities. Reports from the field show that some communities cannot be reached with control activities, as the insurgents still occupy some territories. AFP surveillance for polio in these areas was humanly limited irrespective of the innovations and skilled manpower purely due to security reasons resulting weak surveillance in these insecure areas. In response to the summer outbreaks GPEI partners took deliberate steps to improve on AFP surveillance by redeploying and drafting of skilled personnel to man the outbreak response and surveillance activities. However, at this point it is still early to conclude on the success of the response irrespective of the absence of detected cases since summer 2016, given the security challenges and constraints in reaching all the communities. Furthermore, insecurity had serious implications for the immunity of the populations as many eligible children were not vaccinated which lead to continued circulation of polioviruses in these localized areas.

The Region has also experienced a number of public health emergencies that competed with the polio eradication efforts. These emergencies such as outbreak

of Ebola Virus Disease, among other public emergencies, overburdened fragile health systems in countries and threaten sustainability of health programmes²⁰.

Conclusion

The Region has made marked progress towards eradication of polio. To sustain the gains and keep the momentum, all stakeholders must remain resolutely focused and committed to implementation of the GPEI strategies without wavering until the job at hand is completed. Polio will remain a priority, for the coming years, to ensure a polio free world and pre-empt the danger of re-emergence. Adequate resources must be strategically put in place for immunization, surveillance and prompt response. Countries should continue to come up with local innovations to reach children in hard to reach and insecure areas. A right mix of polio vaccines should be available to protect and boost population immunity against polio. The current situation of global shortage of the inactivate poliovirus vaccine (IPV) to protect children born since the tOPV/bOPV switch from paralysis due cVDPV2s is also another area of concern. This is particularly troubling given the grave danger the populations of the African continent, and indeed the world, face with respect to serotype 2, which needs to be controlled with a different vaccine than WPV1 currently in circulation in the Region. Equally disturbing is the debate on the effectiveness in relying on IPV alone, even when available in sufficient quantities during the OPV cessation period to increase population immunity. It is feared that it may have significantly lower impact on cVDPV risks compared reliance on sufficient trivalent OPV use prior to OPV2 cessation^{21,22}. These issues must be addressed to ensure polio eradication in the Region and the world, once and for all.

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