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Contribution of polio eradication initiative to strengthening routine immunization: Lessons learnt in the WHO African region

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ABSTRACT

Background: Important investments were made in countries for the polio eradication initiative. On 25 September 2015, a major milestone was achieved when Nigeria was removed from the list of polio-endemic countries. Routine Immunization, being a key pillar of polio eradication initiative needs to be strengthened to sustain the gains made in countries. For this, there is a huge potential on building on the use of polio infrastructure to contribute to RI strengthening.

Methods: We reviewed estimates of immunization coverage as reported by the countries to WHO and UNICEF for three vaccines: BCG, DTP3 (third dose of diphtheria-tetanus toxoid- pertussis), and the first dose of measles-containing vaccine (MCV1).We conducted a systematic review of best practices documents from eight countries which had significant polio eradication activities.

Results: Immunization programmes have improved significantly in the African Region. Regional coverage for DTP3 vaccine increased from 51% in 1996 to 77% in 2014. DTP3 coverage increased >3 folds in DRC (18–80%) and Nigeria from 21% to 66%; and >2 folds in Angola (41–87%), Chad (24–46%), and Togo (42–87%). Coverage for BCG and MCV1 increased in all countries. Of the 47 countries in the region, 18 (38%) achieved a national coverage for DTP3 $\geqslant$90% for 2 years meeting the Global Vaccine Action (GVAP) target. A decrease was noted in the Ebola-affected countries i.e., Guinea, Liberia and Sierra Leone.

Conclusions: PEI has been associated with increased spending on immunization and the related improvements, especially in the areas of micro planning, service delivery, program management and capacity building. Continued efforts are needed to mobilize international and domestic support to strengthen and sustain high-quality immunization services in African countries. Strengthening RI will in turn sustain the gains made to eradicate poliovirus in the region.

1. Introduction

Significant progress has been made to interrupt wild poliovirus (WPV) transmission since the 1988 launch of the World Health Organization (WHO) Global Polio Eradication Initiative (GPEI) by the World Health Assembly [1]. Global polio eradication was to be achieved within the Expanded Programme on Immunization (EPI) and the framework of strengthened primary health care. Routine immunization (RI) is a key pillar of polio eradication efforts which aims to ensure that all children receive the recommended childhood immunizations, including three doses of oral polio vaccine (OPV). To enhance population immunity in low coverage areas, RI efforts are complemented with supplemental immunization activities (SIAs) and mass mop-up campaigns which are conducted to administer additional OPV doses to children [2,3].

Since 1988, implementation of the recommended polio eradication strategies (i.e., strong RI, SIAs and well performing acute flaccid paralysis (AFP) surveillance systems) have successfully reduced the global incidence of polio by 99%. Despite success in interrupting WPV transmission, several countries in the African region have experienced widespread polio outbreaks in the recent past. Since 2001, polio outbreaks have occurred in 31 previously polio-free African countries [4]. Prior to 2015, Nigeria had yet to interrupt endemic WPV transmission and was the source of WPV responsible for polio outbreaks in 25 formerly polio-free African countries [5,6]. An extensive set of outbreak response and preventative SIAs were conducted in the countries experiencing polio outbreaks. On

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25 September 2015, a major milestone was achieved in the WHO African region when Nigeria was removed from the list of polio-endemic countries leaving only two countries (i.e., Afghanistan and Pakistan) that have never interrupted endemic WPV transmission [7]. This remarkable achievement brings Nigeria and the African region closer to being certified polio-free and is the result of an extensive response by domestic and international partners that saw sizeable investment in human and financial resources for immunization programs in the region. Objective 2 of the Polio Eradication and Endgame Strategic Plan 2013–2018 further reinforced the resolve to build on build on polio eradication gains, including infrastructure to strengthen immunization programs, phased withdrawal of OPV starting with type-2 containing OPV, and the introduction of inactivated polio vaccine (IPV) into RI programmes globally [8]. This has inspired discussions on how GPEI and RI can benefit from each other especially how polio assets and infrastructure can strengthen RI, and how a strong RI system can accelerate polio eradication.

With the eradication of polio from the African continent fast approaching, questions have been raised as to whether polio eradication efforts in the region contributed to strengthening RI in the African region, especially in those countries with considerable polio eradication infrastructure. The impact of vertical eradication programs on health systems has been a much debated topic in public health [9,10]. Polio eradication activities in the Western Pacific Region resulted in both successful interruption of wild poliovirus (WPV) transmission and strengthened routine vaccine delivery, mainly in previously poor performing countries [11]. Although anecdotal evidence suggests a positive contribution, there is still little documentation on the impact of polio eradication initiatives on routine immunization in Africa. This paper examines the contribution if any of polio eradication activities on RI in eight African countries which had polio outbreaks in the recent past.

2. Methods

We reviewed the estimates of immunization coverage for each country as reported by WHO and the United Nations Children's Fund (UNICEF) from the online information system, which contains immunization and surveillance data reported to the WHO African Regional Office by Member States. The analysis included three common vaccines in the routine infant immunization schedules i.e., Bacillus Calmette–Guerin (BCG), the third dose of diphtheria–tetanus toxoid–pertussis vaccine (DTP3), and the first dose of measles-containing vaccine (MCV1). DTP3 is used as a proxy for vaccination coverage and performance [12].

The two modalities of delivering OPV in the African region were through RI services including Periodic Intensification Routine activities (PIRI), child health days and also through conducting several rounds of polio SIAs. These include national immunization days (NIDs), subnational immunization days (SNIDs), and mop-up rounds. Several doses of OPV were administered to a target population of mostly children aged <5 years.

We conducted a systematic review of best practices documents and other relevant reports from eight countries which had WPV transmission and which had significant polio eradication activities (i.e., Angola, Cote D'Ivoire, the Democratic Republic of Congo [DRC], Ethiopia, Nigeria, Tanzania, Chad, and Togo). The selected best practices were then grouped into four thematic areas describing the specific contribution: microplanning, implementation and service delivery, capacity building and program management. Best practices from the eight countries were considered as representative of all the other AFR Member States. Immunization coverage trends for DRC, Ethiopia and Nigeria countries were also analyzed from 1996 when the polio campaigns were introduced in the AFR after the PEI was launched in 1988.

2.1. Microplanning

Polio campaigns have contributed to the identification of settlements or villages with high number of unvaccinated children by spearheading the development of improved microplans using innovative technology. Use of global positioning systems (GPS) to create accurate, coordinate-based maps for polio-endemic states in Nigeria improved microplans that were consequently utilized to provide routine vaccines [13].

In almost all the eight countries, polio eradication activities (PEI) supported exercises to update health facility microplans named in Nigeria "reach every ward" (REW microplans) to capture previously unreached settlements, improving access and utilization of the immunization services by reestablishing immunization service delivery points (fixed sites) in wards with existing facilities and outreach or mobile sites.

2.2. Implementation and service delivery

Strategies used for unreached children during polio campaigns were leveraged to ensure RI services are provided in identified areas. In addition to delivering OPV, the NIDs or SNIDs and child days were used as opportunities to administer other routine vaccines in all countries in addition to the micronutrient vitamin A.

In DRC, Polio eradication activities facilitated negotiations with armed groups for the vaccination of children during NIDs and also during RI outreach sessions in the eastern part of the country through interpersonal meetings and education of those armed groups.

A similar situation was observed in Angola where the Angolan Army Health Services (AAHS) over the past 20 years have been fully involved in immunization services in hard to reach areas using helicopters and trucks as well as providing RI services on daily basis in their military health facilities and hospitals.

In Tanzania, PEI supported use of village health workers during immunization services in the community.

In Chad, the Ministry of Health worked closely with the National Program of Health for Nomads (PNSN) and the Ministry of Livestock and Animal Resources (MERA) to synchronize vaccination activities for humans as well as cattle and sheep at least twice a year. Key activities included identifying the movements of nomads with their seasonal itineraries, identifying leaders and representatives of nomads, for advocacy, organizing a multi-sector, interagency meetings and developing an action plans for immunization of nomadic children and pregnant women.

2.3. Capacity building

Polio funded staff were used to support other public health activities such as health care worker capacity building activities in the eight priority countries. These included training of health workers in all areas of immunization and supportive supervision.

In Ethiopia, polio funds were used to increase the number of supportive supervision visits to poorly performing zones using an integrated portable digital assistant (PDA) checklist by WHO field officers. Officers analyzed and used the data for action at their level.

Similarly, in Nigeria, PEI contributed to strengthening supportive supervision and using text messages to transmit data and drive corrective actions, known as Nigeria's Real-time Tracking of Routine Immunization Supervision (NRTRIS). After cascade orientation sessions were conducted at national, State and local government area (LGA) level, the polio staff carried out supportive supervision to the health facilities on a weekly basis. An abridged checklist was used to monitor implementation of the planned immunization sessions.