

Polio Vaccination in Nigeria: The 'Good', the 'Bad' and the 'Ugly'

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Abstract

With increase in the number of polio cases, Nigeria serves as the primary threat to a polio free world. The "good" the "bad" and "the ugly" aspects of polio vaccination in Nigeria is discussed. In the 'good' aspect the number of wild poliovirus cases declined by over 90%, cVDPV 2 cases declined by 82%. Similarly, genetic clusters of both wild poliovirus type 1 and type 3 have reduced from 18 and 19 in 2009 to 2 respectively. The Immunity to polioviruses has improved in endemic States and new approaches for better identification of settlements and to promote community participation have been adopted in 2012. On the 'bad' aspect, polio cases have increased from 21 in 2010 to 62 in 2011 and 84 in 2012 (7th September) with ongoing transmission of wild poliovirus type 1,3 and cVDPV2. Declined political oversight at critical juncture and non-implementation of emergency plans in key infected areas has been observed. Non-compliance to the vaccine seems to be the major contributor to the increasing number of polio cases in the country. Lastly "the ugly" face focuses on the aftermath of the boycott of polio vaccination in northern States in 2003 amidst the rumor that the vaccine contained infertility drugs, causes poliomyelitis and spread HIV. After resolving the crisis, some parents in the north still resist compliance with the polio vaccination. Borrowing a leaf from the rally organized by the polio victims, all Nigerians should complement the government efforts in 'kicking' polio out of the country.

Keywords: Polio vaccination; Wild polio virus; Immunization Plus Days; Micro planning; Nigeria

Background

Despite the major progress since the launch of the Global Polio Eradication Initiative (GPEI) in 1988, circulation of indigenous wild poliovirus (WPV) continues in three countries (Afghanistan, Nigeria, and Pakistan). Therefore, in January 2012, completion of polio eradication was declared as a programmatic emergency for global public health by the Executive Board of the World Health Organization (WHO) [1]. In response to this declaration, immunization activities in Nigeria were intensified to delist itself from the endemic countries for wild poliovirus transmission. These activities include routine immunization (RIs), Supplementary Immunization Activities (SIAs), Mop-Ups and Acute flaccid paralysis (AFPs) surveillance. Since 2006 polio SIAs were termed Immunization Plus Days (IPDs) because other interventions were included alongside the normal polio vaccination activities. Such interventions include administration of de-worming drugs as well as vitamin A supplementation, sweets, sachets of milk and toys are availed to children while mothers usually receive soaps during the house-to-house polio campaigns. Introduction of these incentives greatly encouraged mothers to take their children for vaccination. In some parts of the country, SIAs are conducted about 6 to 7 times a year on monthly bases but depending upon the epidemiology of poliovirus and the recommendations of the Nigeria Expert Review Committee (ERC) for polio eradication. Children usually receive trivalent oral polio vaccine (tOPV) types 1, 2, and 3, at birth and at ages 6, 10, and 14 weeks during the routine immunization (RI) sessions [1]. Monovalent oral polio vaccine (mOPV) type 1 and type 3, bivalent oral polio vaccine (bOPV) types 1 and 3 or tOPV types 1, 2, and 3 are used during IPDs. However, between 2010 and 2011, bOPV largely replaced mOPV type 1 and 3 during the IPDs. Generally, combination of mOPV1, mOPV3, bOPV or tOPV are used IPDs. Immunization coverage is usually measured using both administrative data (estimated doses administered per targeted child population, determined official census numbers) and coverage surveys [1]. The overall objective of the IPDs is to achieve interruption of transmission of wild poliovirus in Nigeria through the delivery of supplemental oral polio vaccine (OPV) to all

eligible children in the country. Yet Nigeria remains one of the three entrenched reservoirs of wild poliovirus in the world with ongoing transmission of wild polio virus types 1, 3 and cVDPV2. This paper reports the "good" the "bad" and the "ugly" aspects of polio vaccination in Nigeria. The map of Nigeria is presented in Figure 1.

Nigeria is a country in West Africa. Nigeria shares land borders with the Republic of Benin in the west, Chad and Cameroon in the east, and Niger in the north. Its coast lies on the Gulf of Guinea in the south and it borders Lake Chad to the northeast. Noted geographical features in Nigeria include the Adamawa and Jos Plateaus, and the Niger River and Niger Delta. The country's geographic coordinates are 10°00'N 8°00'E. There are two WHO accredited National/ITD Polio Laboratories in the country, each of which is located at University of Ibadan and University of Maiduguri Teaching Hospital, Maiduguri. The former serves 27 States while the latter serves 10 States.

Target population for Polio vaccination in Nigeria

Children aged 0-5 years.

Sources of data

Most of the figures in this paper were obtained from the presentations during the 23rd and 24th Expert Review Committee on Polio Eradication Program, held in Abuja on Wednesday 28th March and 10th September 2012 respectively.

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Micro-planning for IPDs

This stage usually starts as soon as NPHCDA declares the IPDs dates. Although the activities start at the state but concentrate at community level. During the micro planning, recent IPDs performance is reviewed and high risk operational plan (HROP) is set on motion. Other action point is to develop schedule of activities which include identifying sources of funding and allocating it for all the activities scheduled for IPD. This is usually followed by series of trainings and meetings for state and LGA officials by NPHDA. Also, the necessary supervisory plans are developed and officials are assigned to support LGAs during the exercise. Moreover, planning includes developing vaccine delivery logistic and effective communication strategies, deliberating on team composition, areas for deployment and workload for each team. Eventually, specific roles are assigned to IPDs teams and supervisors as well as producing the master list of settlements for catchment area development.

It is necessary to start this paper with the 'ugly' face of polio vaccination in Nigeria because it gave birth to the 'bad' face.

The 'ugly' face of polio vaccination in Nigeria

In 2003, polio vaccination campaign was "boycotted" by some states in northern Nigeria amidst rumors that polio vaccines contained infertility agents with which the Western world hoped to control the population growth, cause poliomyelitis and spread HIV [2-4]. The boycott led to the spread of polio into twenty countries across Africa, the Middle East and Southeast Asia causing 80% of the world's cases of paralytic poliomyelitis [4]. This resistance to polio vaccination efforts in Northern Nigeria created a global health crisis that appeared political in origin but religious in operation. After the concerted effort of high ranking global health officials to prove beyond all reasonable doubt, the safety of polio vaccine used for polio eradication initiative (PEI) worldwide in July 2004, some parents in the northern parts of Nigeria are still refusing to comply with the program under the guise of missed children or house (s) not visited by the vaccination team during the exercise among others (Figures 6, 7, and 8). Among immunization activities listed above, house to house vaccination exercise is carried out during IPDs while RIs are conducted at the health centres (either primary or secondary or tertiary). In comparison with all the immunization activities, RI does not only contribute significantly to the interruption of poliovirus transmission, it also sustains protection amongst vaccinated or immunized children. For instance, in southern part of the country where RI is strongest, transmission of wild poliovirus has been stopped unlike the northern part, where RI is low, the spread of WPV persists. Generally RI in Nigeria is yet to achieve the desired coverage in terms of quality and quantity to make the necessary impact on polio eradication in the country.

The 'bad' face of polio vaccination in Nigeria

Epidemiology of polioviruses: On the 'bad' aspect, polio cases have increased from 21 in 2010, 62 in 2011, and 84 in 2012 (7th September 2012). At week 31 in 2011, 21 WP1 and 8 WP3 were reported but at the same period in 2012 (3rd August), 46 WP1 and 14 WP3 were obtained. (Figures 5a and 5b). Current report from 24th ERC [5] revealed that whilst 36 cases from 6 states were reported by 7th September 2011, 84 cases have been obtained from 11 states at the same period this year. The 11 high risk states with persistent wild poliovirus transmission in Nigeria include Borno, Jigawa, Kano, Katsina, Kebbi, Sokoto, Yobe, Zamfara, Kaduna, Bauchi and Niger. 60% of cases were obtained from 3 (Katsina (22), Kano (17) and Kaduna (11) of the 11 endemic states.

Currently, Katsina has the greatest number of reported polio cases in the world. It could be speculated that in Katsina State, more than one-third of children remain under-immunized, with an estimate of 52% of children having received less than four doses of OPV. Out of 84 polio cases obtained so far, 35 (42%) were obtained from nine high risk LGAs in northern Nigeria [5]. Another report showed that, 90% of these cases occurred among children aged 0-5 years and 32% of these cases had zero dose of the polio vaccine. 67% of all cases were reported in known high risk LGAs while all cases in other areas were genetically related [6]. Among the prevalent serotypes of polioviruses in Nigeria, WP1 is the commonest from all but 2 of the 11 high risk states in northern part of the country while WP3 persists in north-central and northern-eastern states.

Funding, resources and political commitment: Overall, there had been gaps in funding and resources as well as undue interference by both the political and traditional classes in some of the processes in team selection. In addition, there had been lack of accountability at virtually all levels and sanctions on poor performance. Moreover, decline in political oversight (Figures 2, 3 and 4) at critical juncture and non-implementation of emergency plan has been observed in key infected. These identified gaps have contributed for the persistent transmission of wild Polio virus in Nigeria despite magnificent strategies put in place by all the Stakeholders to push polio out of Nigeria.

Figure 2 shows that, the meetings of the state Task Force on PEI was generally poor in the last quarter of 2011 but slightly increased in the second quarter of 2012, especially in HRs. It declined in the second quarter of 2012 especially in Southern states.

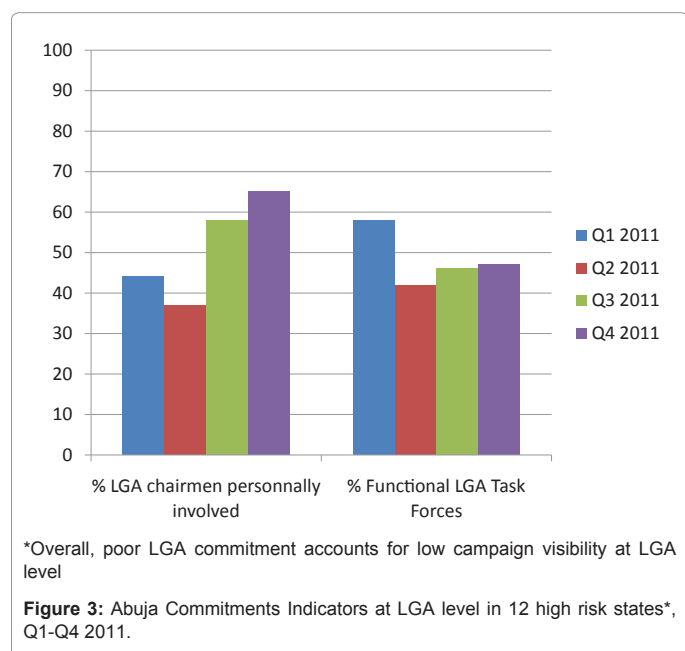
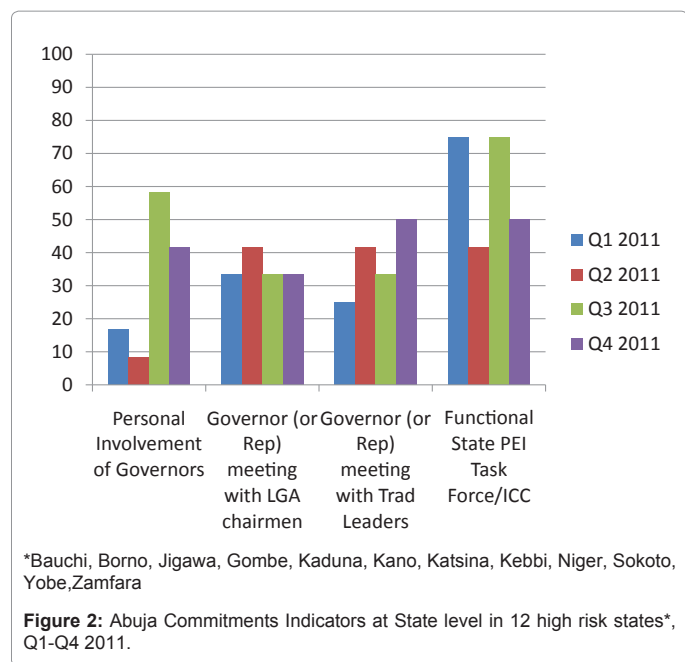
In figure 3, the personal commitment of the State governors and LGA Chairmen as exemplified in the rate of their meetings on PEI, was generally low at the national level but worst in northern states in the first quarter of 2011. However, this commitment significantly increased in HR states in the first but declined in the second quarter of 2012

Figure 4 shows that Borno, Jigawa and Kano account for 68% of all 2011 polio cases (both WPV and cVDPV) and the percentage of functional LGA Task Forces in Q4 in the infected LGAs ranged from 0% to 45%

In figure 6, the reasons given for non-compliance to polio



Figure 1: The map of Nigeria showing the two WHO accredited Laboratories and the States each serves



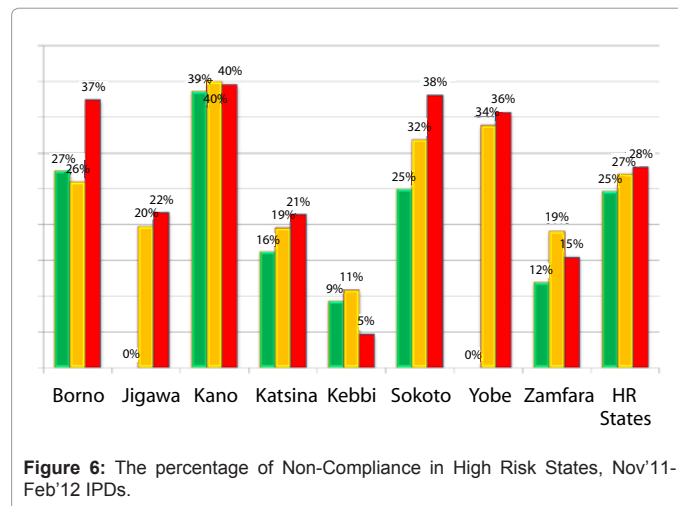
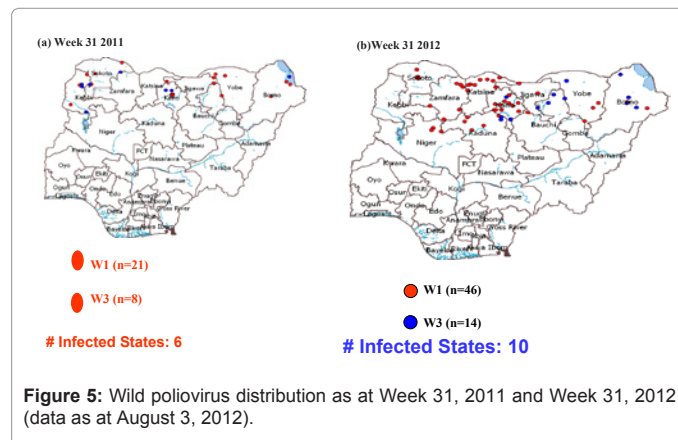
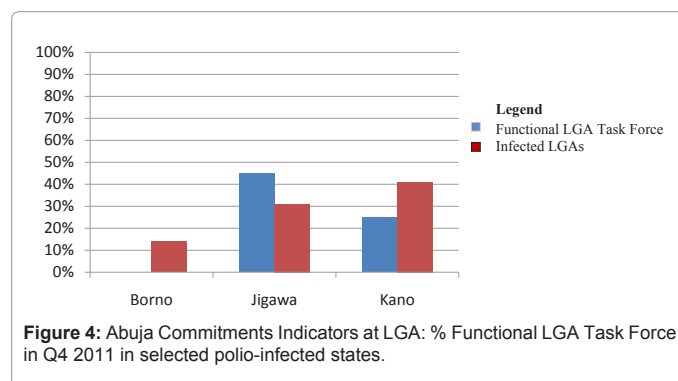
vaccination are the 'aftermath' of the 'boycott' of the program as narrated in the ugly face of the PEI. Forty-two percent (42%) of the respondents in Borno State (a state that contributed more than 38% of WPV in 2011) had no reason for rejecting polio vaccination while 37% in Jigawa State attributed their rejection to the safety of OPV. Overall, the reasons given for non-compliance to polio vaccination are nothing compared to the impact of poliomyelitis in a Nigerian child.

The 'good' aspect of polio vaccination in Nigeria

Reduction in the number of cVDPV 2: cVDPV 2 cases declined by 82%, from 154 in 2009 to 57 in 2011 and 1 case in 2012 (7th September). This represents a significant decrease in cVDPV circulation and an opportunity for the program to interrupt this long standing outbreak.

Reduction in the number of genetic clusters: There is drastic reduction in the number of genetic clusters of WP1 and 3. WP1 genetic clusters have reduced from 18 in 2009 to 2 in 2012 (February). Similarly that of WP3 has reduced from 19 in 2009 to 2 in 2012 (February) (Figure 10).

Involvement of traditional leaders in social mobilization: In 2009, traditional leaders in the northern states of Nigeria were engaged (Figure 9) and their contribution was part of efforts that led to the unprecedented 95% reduction in poliomyelitis cases. Decline of cases by over 95%, from 388 in 2009 to 62 in 2011 and 84 in 2012 (7th September); cVDPV2 declined by 82%, from 154 in 2009 to 35 in 2011



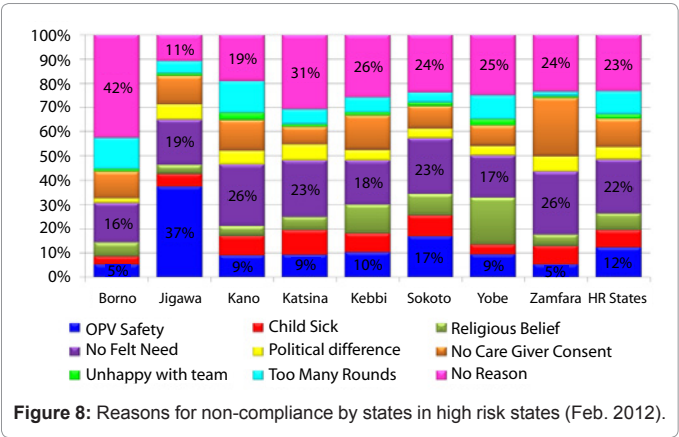
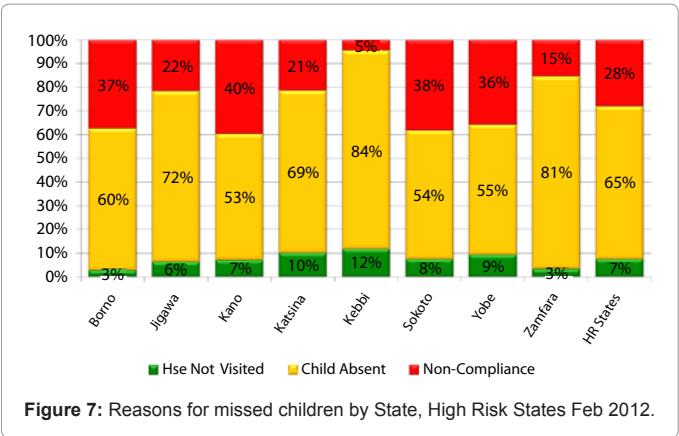


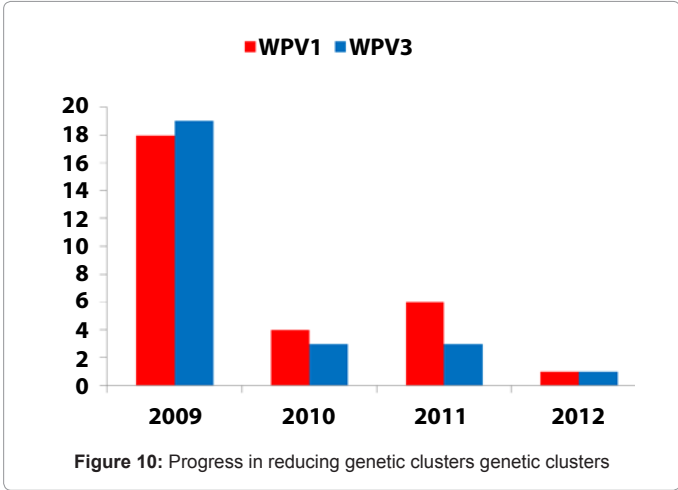
Figure 9: Involvement of the Traditional leaders: A traditional leader administering OPV to a child.

Figure 10: Progress in reducing genetic clusters genetic clusters

The genetic clusters of WP1 has drastically reduced from 18 in 2009 to 4 in 2010, 6 in 2011 and 2 in 2012 (Feb 2012). Similarly, that of WP3 reduced from 19 in 2009 to 3 in 2010, 3 in 2011 and 2 in 2012 (Feb 2012).

Political commitment

To optimize the president's commitment (Figure 11) to polio vaccination, in Oct 2011 he increased domestic funding to Polio Eradication Initiative (PEI) operational costs to USD 30 million per annum for 2012 & 2013. In October 2011 the president announced the establishment of presidential Task force with the Honorable Minister of State for Health as the Chairman. The Task force was charged to



oversee the implementation and monitor the progress towards successful interruption of wild poliovirus transmission in Nigeria. In Nov-Dec 2011, the Presidential Task Team met to prepare its Terms of Reference (TOR), Operational Guidelines and Draft PEI accountability Framework. Similarly, at the third quarter of 2011, state Governors declared commitment to polio eradication. Then in Jan 2012, Chairman of Presidential PEI Task Force (Hon. Minister of State for Health) presided over National PEI stake-holders annual review and planning meeting during which 2012 priorities as well as the format and time-lines for the finalization of 2012 PEI Emergency Plan were deliberated upon and adopted. Eventually, the Presidential Task Force on Polio Eradication was inaugurated by Mr President on 1st February, 2012 and it held its first meeting on the same day.

Discussion

Nigeria serves as the primary threat to a polio free world with increasing number of wild poliovirus transmission. The intensified effort of Nigerian government to eradicate polio is not eminent as far as WPV transmission persists. This signifies that many children are still unimmunized or failed to receive more than three doses of the vaccine or are missed during the vaccination exercises. Efforts to identify reasons for chronically missed children include houses not visited, child absent and non-compliance and reasons for rejecting the vaccines varied from doubt on the safety of the vaccine, child sick, religious beliefs, too many rounds to mention but few (Figure 8). Averagely 25% of non-compliance cases had no reasons for rejecting the vaccine while only 12% expressed their doubt on the safety of the vaccine [7]. This implies that, pockets of parents are still boycotting polio vaccination due to the propaganda on the safety of the vaccine in 2003 [2]. There may be need to reconsider child absent as 'disguised non-compliance cases' because with repeated rounds of IPDs, ordinarily missed children should not occur. It is a common practice for non-compliant parents to hide their children once the vaccinators are sighted from afar off and such children will be described as 'child absent' which constitute 66% of the chronically missed children (Figure 7). Similarly, some houses not visited during the exercise should be treated as non-compliance cases as such parents intentionally failed to open the gates of their compounds to the vaccinators. However, there may be some cases of houses mistakenly missed during the micro-planning especially when the map was manually produced. The rate of non-compliance in February 2012 was higher in some States (example Borno, Kano, Sokoto and Yobe) than others (Kebbi and Zamfara) compared to November and December 2011. Although, the period for comparison is not wide enough to draw logical conclusion, but the unprecedented increase in the number of cases (84) in 2012 compared to 2011 (62) points to non-compliance as a major contributor. In 2012, Katsina (22 cases) is currently the state with the greatest number of reported wild polioviruses in the world. However in 2011, Borno, Jigawa and Kano contributed about 68 % of polio cases [7]. Overall, the rate of non-compliance among the high risk states (HRS) was not significantly different. It could be speculated that, non-compliance to polio vaccine in HRS is yet to be adequately addressed in agreement with the report of the 24th Expert Review Committee [5] on Polio eradication in Nigeria. In that report, the reasons underpinning the high number of chronically missed children during IPDs and RIs are poorly understood. To address this problem from its root, the ERC has recommended that a social research should be conducted in worst performing LGAs/Wards with the view to improving team performance [5].

Despite the increase of the operational cost for polio eradication to 30 million US dollars per annum for 2012 and 2013 including

supporting funds from foreign partners, funding gaps still exist as reported during the 23rd ERC [9]. Prudent and judicious utilization of allocated fund is vital to 'kick polio out' of the country.

Structuring vaccination team/Supervisor composition based on religious, political or tribal sentiments have been observed in some states. In such situation, sanctioning poor performance became a difficult task to perform. The end-product of incompetent, undisciplined and poor performing team in respect of polio vaccination is persistent wild poliovirus transmission in the country. Another key issue that constitutes to the 'bad face' of polio vaccination in Nigeria is the striking decline in the direct participation of governors/Chairmen of HRS/LGAs. The decline in the personal commitment of the state governors and LGA chairmen as well as the state Task Force on polio eradication program in the last quarter of 2011 (Figures 2 and 3) probably contributed to the increased in the number of polio cases reported in 2012. Aside from the social mobilization led by the traditional leaders to break the ice of non-compliance, governors and LGA Chairmen are bound by their political commitment to their subjects to ensure that no child in Nigeria contracts poliomyelitis. Recently, ERC has recommended that Federal government and the Presidential Task Force should reverse this order as a matter of urgency. To effectively monitor the commitment of these political leaders, tracking machineries pre, intra and post IPD have been set on motion [5]. Although accountability framework has been introduced across-board in Polio Eradication Initiative but if it is not properly implemented, it shall be 'business as usual'.

The engagement of traditional leaders in the northern states of Nigeria in 2009 to socially mobilize parents to accepting the vaccine (Figure 9) against the 2003 propaganda contributed to the unprecedented 95% reduction in poliomyelitis cases from 388 in 2009 to 62 and cVDPV2 declined by 82%, from 154 in 2009 to 35 in 2011. The increased number of polio cases experienced in 2012, despite the efforts of the traditional leaders, is multifactor and requires concerted effort at all facets of the program to reverse the order as soon as possible. If polio victims organized a rally in support of the polio eradication program in the country (Figure 12), what role should the parents especially mothers (who bears the crux of the burden of a paralysed child), youths, healthy adults play to complement the effort of the government in eradicating polio. Every member of the community in Nigeria should be personally involved and committed in supporting 'a stop' in the transmission of wild polio viruses. The number of cCDPV 2 has drastically declined from 154 cases in 2009 to only 1 in 2012 (7th September). Ability of the PEI to end this outbreak adds to the 'good face' of the program. Similarly, a significant decrease in the number of genetic clusters from 18 (WP1) and 19 WP3 in 2009 to 2 (for both WP1 and WP3) in 2012 further proves that Nigeria has what it takes to eradicate polio. The persistence of the polio cases in the country implies that, either something is not properly done or implemented at all for polio to have a final 'kick' out of the country. Holistic and comprehensive approaches in assessing the possible reasons are what Nigerians need now. It is believed that part of the efforts to improve strategies in reaching chronically missed children with the vaccine is the currently introduced new technologies such as Geographical Information System (GIS) and Global Position System (GPS). The former helps in generating maps of the catchment area electronically for an improved, and more comprehensive micro-planning while the latter monitors team performance. With these technologies and newly introduced house - based (and not compound - based) micro-planning community/wards with persistent polio viruses are better identified and targeted. Moreover, community participation during micro-

planning has improved significantly compared to the previous years. For more fruitful community participation during IPDs, an enhanced ward level communication strategy using locally available methods and languages is now in progress for effective dissemination of information. In addition, the newly adopted systematic implementation of revisit/ repeat vaccinations where necessary in few households has been adopted to catch genuinely missed children. For instance at Kebbi State, such revisit/ repeat vaccination for children who were absent during the day is carried out at 8pm on the same day of the exercise. It is hoped that other HRs will emulate such strategy to reach ordinarily missed children. The emergence of orphan WPV cases over the past few years along traditional nomadic routes in northern Nigeria suggested that nomadic populations could be mobile reservoirs of polio virus. Therefore, LGAs with large nomadic populations are now identified by using stock route maps with appropriate linkages established between Liaison Officer and Ward Focal Persons and the respective Sarkin Fulanis to maintain current location information to facilitate micro-planning.

Conclusion

Nigeria may still harbor and export the three wild polioviruses to other countries, but there is significant reduction in polio cases by over 90% and in genetic clusters of polio viruses. New technologies/ strategies have been introduced to aid an improved comprehensive micro planning for all IPDs. The propaganda that led to the boycott from polio vaccination in 2003 will soon be a thing of the past if the effort of the traditional leaders is complemented by the commitment of governors and LGAs Chairmen in HRs.

Recommendation

1. At National level, Federal Government should enact a law (as exemplified by Jigawa State Government who has enacted Law No.5, 2012 for free and compulsory Immunization in the State) that would make it a criminal offence for any parent to prevent their children/ward from receiving the vaccine against polio and other antigens.
2. The proposed law should make it mandatory for parents to immunize their children against these antigens and its rejection to attract punishment.

3. Mandatory implementation of all the strategies adopted for polio vaccination program in Nigeria.
4. To sanction non performing IPDs teams/ supervisors.

Caption

'Faith without work is failure, plan without implementation is failure'

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