

Personal Experience

Combating an Outbreak of Poliomyelitis in Sudan Following Wild Poliovirus Importation: A Success Story

Elsadig Mahgoub Eltayeb MD¹, Salah Salem Haithami MD², Eltayeb Ahmed Elsayed MD³,

¹ National Coordinator, AFP surveillance, EPI, Federal Ministry of Health, Sudan, e-mail: afpsud@sudanmail.net, Mobile: +249-912391076. ² POL/MO, WRO, Sudan, ³ Director Federal EPI, Federal Ministry of Health, Sudan

Background

Sudan started its efforts to eradicate poliomyelitis in 1994. A double-round campaign of National Immunization Days (NIDs) has been conducted every year until 1999. During the period 1994-1997 those campaigns covered mainly the government-controlled areas in both northern and southern sectors. Starting from 1998, areas under control of SPLM/A (Sudan People Liberation Movement/Army) were covered by Oral Polio Vaccine (OPV) immunization. WHO in collaboration with its partners in Operation Lifeline Sudan programme (OLS) were responsible for conducting supplementary immunization activities (SIAs) as well as Acute Flaccid Paralysis (AFP) surveillance. OPV was delivered to children less than 5 years of age in fixed vaccination posts until the second half of 2000 when house-to-house immunization was adopted. War-affected areas were reached frequently using the benefit of periods of tranquility secured by Government of Sudan (GoS) and SPLM/A. Up to date, March 2006, 14 NIDs with double rounds campaigns were conducted.

Overall routine immunization coverage has improved evidenced by the OPV coverage rate which was 64% in 2002 and 83% during 2005. Added to strengthening the management, the states benefited very much from the Global Alliances for Vaccine Initiative (GAVI) support to do this excellent progress.

AFP surveillance system was established in 1996 and 1998 in the north and the south respectively. At the beginning of 2000, WHO provided technical and financial support so that by the beginning of 2001 the AFP surveillance in the country attained the globally required certification level. The stool samples from the GoS-controlled area and from SPLM/A controlled area were tested in the national polio laboratory in Khartoum and Nairobi respectively.

Sudan has not reported polio cases since April 2001 when one wild polio case P1 was reported from Unity state (OLS area). The virus was an orphan. Since the polio free period was more than three years, the country submitted its national certification document to EMRO certification committee and continued to provide annual updates.

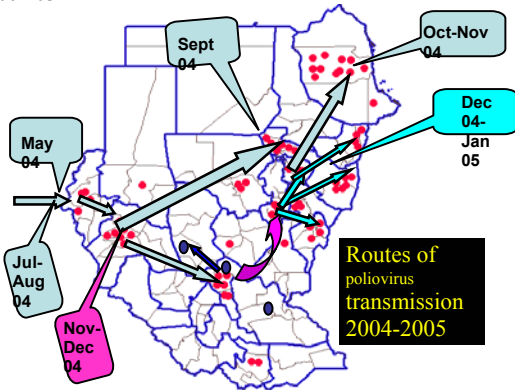
Case Description

The importation: On 20th of May 2004, an AFP case was detected in a remote area of West Darfur. The case was investigated and confirmed to be a polio case due to PV1. The genetic sequencing in reference laboratories confirmed that the virus was imported from Chad that was imported to it from Nigeria. Laboratory confirmed the occurrence of 127 wild polio cases during 2004 and 27 wild polio cases during 2005. The last case was reported from River Nile State on the 17th of June 2005.

The outbreak: Following the first imported case, other polio cases were detected among the population

in Kass administrative unit, and from there the virus has spread to other states. The spread of the disease followed the known historical route for epidemics in the country. This route coincides with the migration of labourers and West African pilgrims through the country. In fact the time and distribution depended very much on their mode of travel and the destinations of various groups (figure 1) so that Kordufan, Khartoum and Red Sea states were affected earlier than the south eastern parts of the country as the first group uses aircrafts, buses and cars while the second group uses other less swift methods for their travel and they usually work during their march.

Figure 1: Distribution of polio cases and population density, 2004-05



The distribution by time and place of polio cases due to this epidemic, non-polio and pending AFP cases are shown in figure 2.

Figure 2: Distribution of polio, non-polio and pending cases in Sudan by week of onset.

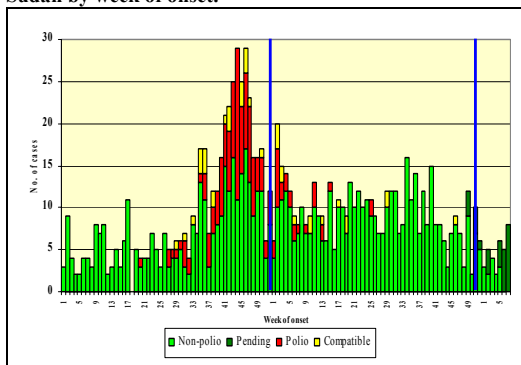
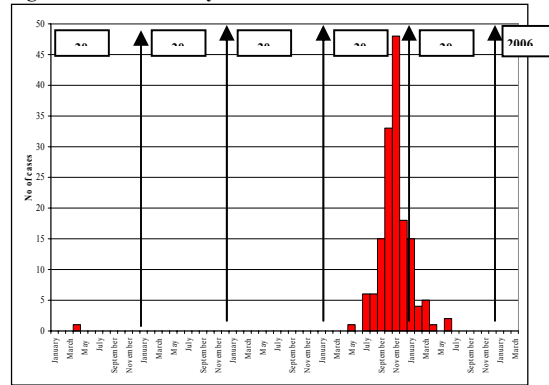
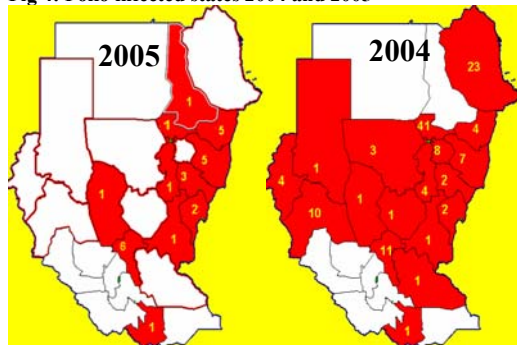


Figure 3: Polio cases by month for 2001 to 2005



During 2004 the imported virus caused cases in 18 states of the country, while during 2005 one more state reported a case (River Nile). Seven states did not report any wild polio virus case (Northern, Warab, West Equatoria, West Bahrelgazal, Elbuhairat, North Bahrelgazal and East Equatoria) (figure 4).

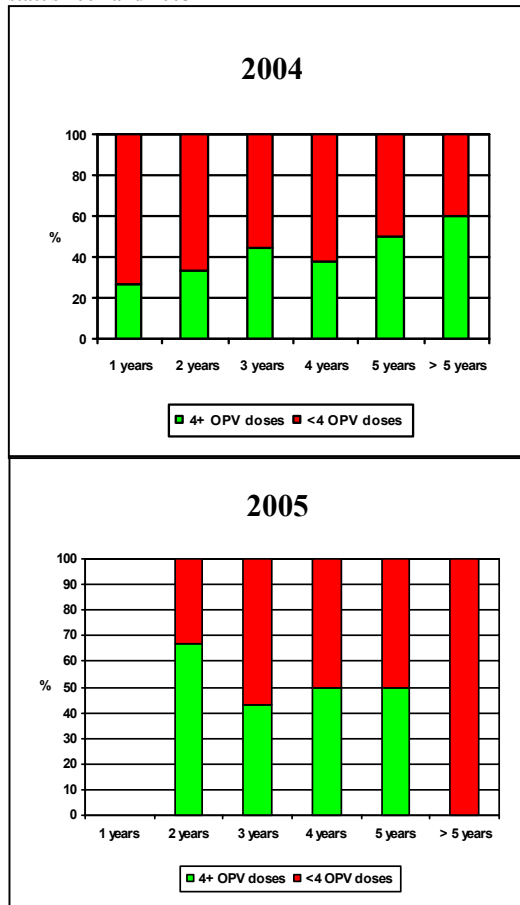
Fig 4: Polio infected states 2004 and 2005



Epidemiological evidence to date indicates that wild polio virus is being spread from Nigeria by cross-boarder surface movements of people to countries in West and Central Africa. This is facilitated by predominance of asymptomatic carriers as about only one out of two hundred infections results in symptoms.

The affected children were of young age group. The majority was less than three years old (> 80%). 50% of these cases were not immunized or partially immunized, particularly those under three years (figure 5).

Figure 5: Distribution of polio cases by age and vaccination status 2004 and 2005



The response: The response to the importation was prompt and well documented according to the national preparedness plan.

- High risk areas and population groups were identified and continuously updated for Greater Darfur as well as other parts of the country.
- Reporting sites and/or focal persons at borders and high risk areas were strengthened.
- State EPI/AFP officers were continuously sensitized to the risk of importation. Efforts were undertaken to improve the routine EPI using GAVI fund.
- SNIDs were focussed in these areas (borders, insecure areas, and remote localities) in 2004 and at the beginning of 2005.

Supplementary Immunization Days

Mop-up immunization campaigns: A rapid plan was prepared to cover children by OPV in the three states of Darfur. Implementation of that plan started at the end of June 2004. The first round of immunization was launched on 27th of July 2004 for three days in Darfur. A little more than one million children were vaccinated. The coverage rate was 98%. The second round followed on 28 August 2004 and achieved 102% coverage rate.

National Immunization Days: these were implemented country- wise during 10 - 12 October 2004, 21st – 23th November 2004, 10th – 12th January 2005, 27th Feb – 1st Mar 2005, 11th - 13th April 2005 and 24th – 26th May 2005. Cross border coordination meetings were held with all neighboring countries to synchronize the NIDs and exchange of information effectively.

Discussions

The speed and scale of this epidemic were due to: recurrent importations at the beginning of the high transmission season, low population immunity due to cessation of NIDs (insufficient funds), sub-optimal routine immunization at that time, large population movements as a result of the ongoing peace process, the recent movement across the country of west and central African pilgrims and the insecurity situation in Darfur state.

Lesson learned: The poliovirus importation and the response was a new experience to Sudan polio eradication team. Yet, it showed a high level of alertness and competency to respond effectively. The following bullets summarize the lessons learned positively and negatively.

Shortcomings: Low routine immunization against polio was one of the main risk factors that made the outbreak to spread widely in Sudan. The coverage of OPV remained below 80% for a number of years

which led to accumulation of susceptible children. Most of these children are living in crowded and poorly hygienic conditions. Cessation of NIDs in 2003 and beginning of 2004 was another major factor that led to accumulation of susceptible children. Insecurity in Darfur states due to the armed conflict pushed the people to move to and from Chad, and other states of Sudan. This movement is believed to be responsible for the first importation incident and contributed to the subsequent spread of the polioviruses. Historical movement of people from West African countries to Sudan for Omra, Pilgrimage and seeking water and grass caused the poliovirus to move with these people. The introduction of a heavy virus load to Port Sudan happened in the three-four months before the Pilgrimage season. The temporary movement of workers from the West to the central and eastern states in the season of harvest played an important role in bringing the poliovirus at later stage of the outbreak. Although 1.1 million children were vaccinated against polio in Darfur and west Kordofan states, the mopping up immunization campaign was not sufficient to contain this outbreak

Successes: The AFP surveillance system proved to be sensitive enough to pick polio cases very rapidly. The system could detect the cases in safe areas as well as in high-risk areas due to insecurity. Appropriate and quick action to investigate polio cases both in the field and laboratories (NPL, Regional reference labs and CDC labs). SIAs response was prompt and of high quality. Attraction of international support, financial and technical. Gaining experience Overcome the fist shock

Recommendations: High routine OPV coverage is a must for polio eradication. Do not hurry to stop SIAs

in a country where routine OPV is low and the surrounded by infected countries. SIA response should be massive. AFP surveillance is the key in detecting importation, so it has to be fully supported.

Sources

1. Eichner M, Dietz K. Eradication of poliomyelitis. When can one be sure that poliovirus transmission has been terminated? American Journal of Epidemiology. 1995, 143:pp 816-822.
2. Federal EPI. AFP Surveillance annual report 2004, Federal EPI, Federal Ministry of Health, Khartoum, Sudan, 2005.
3. Federal EPI. AFP Surveillance annual report 2005, Federal EPI, Federal Ministry of Health, Khartoum, Sudan, 2006.
4. Federal EPI. AFP surveillance guidelines, update 2005, Federal EPI, Federal Ministry of Health, Khartoum, Sudan, 2005.
5. Heymann D. L., Control of communicable diseases Manua, 18th edition. APHA &WHO. American Public Health Association, Washington D C, 2004. pp 425-431.
6. World Health Organization. Polio: the beginning of the end. Geneva: World Health Organization, 1997.
7. World Health Organization. Global eradication of poliomyelitis. Geneva: World Health Organization, 2000.
8. World Health Organization. Global eradication of poliomyelitis, Progress 2000. Geneva: World Health Organization, 2001.
9. World Health Organization. EMR eradication of poliomyelitis, 2001. Cairo: Eastern Mediterranean Regional Office, World Health Organization, 2001.
10. World Health Organization. Making Surveillance work, Department of vaccines and biologicals. Geneva: World Health Organization, 2001.
11. World Health Organization. EMR eradication of poliomyelitis, Plio fax number390, week 10 (20 March 2006),Cairo: Eastern Mediterranean Regional Office, World Health Organization, 2006.