

## Polio Eradication-Indian Success Story

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The global eradication of Poliomyelitis began in 1988 led by WHO, UNICEF and Rotary foundation. Along with 192 member nations of WHO, Government of India also committed the nation to the goal of global polio eradication. After Smallpox in 1979 and Rinderpest in 2010, Polio myelitis, if eradicated globally, would be the third disease to be conquered. (1, 2)

The key strategies outlined by WHO for stopping transmission of Polio virus are three :-

1) Four doses of OPV(Oral Polio Vaccine ) in first year of life in developing and endemic nations while routine immunization with OPV and / or IPV elsewhere.

2) National immunization days to provide supplementary OPV doses to all less than five years of age.(3)

3) Active surveillance for wild Polio virus through reporting and lab testing of all cases of acute flaccid paralysis (4) among children below fifteen years of age.

4) Targetted 'mop-up' campaigns once wild Polio virus is limited to a specific focal area.

OPV is highly effective, safe and inexpensive; the immune response to it is very similar to natural Polio infection and provides similar lifelong immunity to the virus. (5,6) Contact immunity to Polio can never occur when attenuated Polio virus derived from OPV is excreted and infects and indirectly vaccinates in vaccinated individuals. (7) Polio vaccination is also important in the development of herd immunity. (8) When a large number of hosts are vaccinated simultaneously, wild virus transmission is blocked and without a human host, the virus dies out. (9) Only 95% of individuals develop immunity on receiving OPV10. So here comes the role of herd community. It is estimated that 80- 86% of individuals in a population must be immune to Polio for the susceptible individuals to be protected by herd immunity (10).

India recently achieved a landmark success in public health when it completed three consecutive years of zero Polio cases to be declared Polio free by WHO. The last

case of Polio was reported in Howrah district of West Bengal when a two year old girl got paralysis on 13<sup>th</sup> January 2011. With a densely concentrated population of more than 1 billion people, India was once considered the most challenging place on the earth to end Polio. This success story is the result of political will and efforts of heroic 2.3 million vaccinators delivering Polio drops to local communities. "India's success is arguably its greatest public health achievement and has provided a global opportunity to push for the end of Polio" WHO Director General Margaret Chan stated in a news release. "Stopping polio in India required creativity, perseverance and professionalism - many of the innovations in polio eradication were sparked by the challenges in India. The lessons from India must now be adapted and implemented through emergency actions to finish polio everywhere," she said.

This remarkable feat of India paid the way for Polio free certification of SEAR( South East Asian Region ) of WHO on 27 March 2014. The SEAR became the fourth WHO region in the world to be certified as Polio free, leaving just two regions yet to be certified thus making 80% of global population free of polio.

Reaching the vast population with diverse socio cultural practices, overcoming the physical and social barriers, achieving high vaccination coverage in all areas despite pitfalls in health system and coverage of the vulnerable infant and migrant population were the major challenges that have been overcome in this success story. OPV was introduced in India in 1978 but the mass Polio campaigns were launched in 1995. (10, 11) The Expert Advisory Group was set up in 1999. All these efforts bore fruit in 2010 when only 42 Polio cases were reported as against 741 cases in 2009. Each nationwide campaign in India involves vaccinating nearly 170 million children in more than 240 million households. Research and innovations have been an integral part of the programme, with more efficacious monovalent OPV (m OPV) was introduced in 2005 and bivalent OPV in 2010 to break the last chains

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of transmission. Heightened surveillance for Polio virus has been the backbone for this successful campaign. The Indian Expert Advisory Group for Polio eradication comprising International and national experts has played a key role in review and suggesting appropriate measures for further programmatic improvement. Vaccines, immunology and microbiological issues were of supreme importance but addressing socio-cultural resistance to repetitive vaccination was crucial to the success of program.

Despite this, India remains at a risk of Polio resurgence through a distant or cross border importation of the wild Polio virus from countries with ongoing transmission. Pakistan has already touched the figure of 187 polio cases till the first week of Oct.-2014 and in all probability is likely to cross 199 cases which was recorded in 2000. As a Polio risk mitigation strategy, 102 vaccination posts have been identified along the border areas of Pakistan, Nepal, Myanmar, Bangladesh and Bhutan to vaccinate under five children crossing these borders. India is also seeking Polio vaccination of all travellers coming to India from the polio endemic and recently infected countries.

In the Polio end game strategy, India achieved elimination of wild polio virus elimination using OPV (Phase 1 of polio eradication). In phase 2, the country would switch from trivalent OPV to bivalent OPV followed by phased withdrawal of OPV and possible introduction of inactivated Polio vaccine (IPV) in routine immunization schedule. True polio eradication demands zero incidence of both wild and vaccine poliovirus.

The Polio eradication programme is a 'model of excellence' for other public health initiatives in India and Global health interventions as a whole. It is utmost important for India to continue the good work till global polio free status is achieved. Besides aiding the struggling nations with funding and strategic help to bring them the same public health success, the success India has achieved during long years of hard work will help shape the future designs of health programmes.

Economic modeling has found that Polio eradication would save at least 40-50 US billion \$ over the next 20 years mostly in low income countries. Most importantly, success will mean that no child will ever again suffer the terrible effects of lifelong Polio paralysis.

At a Global Vaccine Summit in Abu Dhabi, UAE in April 2013, WHO announced a new US \$ 5.5 billion, six

year cooperative plan (called the 2013-18 Polio eradication and Endgame strategic plan) to eradicate Polio from its last reservoirs. The plan calls for mass immunization campaigns in three remaining endemic countries i.e. Pakistan, Afghanistan and Nigeria. (12) It also dictates a switch to IPV to avoid vaccine derived out breaks that occasionally occur from use of OPV. (13)

In May 2014, WHO declared polio's renewed spread as a world health emergency. The journey of our nation from being a hyperendemic nation to a polio free nation is truly amazing. So the need of the hour is not to lower the guard over the success achieved during last two decades through sheer grit and determination.

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