

Global Polio Eradication Initiative

The Lancet: publication of monovalent oral polio vaccine efficacy study

Interpretation and significance

Synopsis:

On 12 April 2007, a leading medical journal, *the Lancet*, published the results of a new study¹, showing increased efficacy of monovalent oral polio vaccine type 1 (mOPV1) over the traditionally-used trivalent OPV

against paralytic polio due to type 1 poliovirus. The results of this study have substantial implications to the global polio eradication effort, and emphasizes the technical feasibility of rapidly finishing polio once and for all.

New Lancet publication: Fast Facts

- ✓ mOPV1 three times as effective as trivalent OPV against type 1 polio
- ✓ Wide-scale use of mOPV1 can raise population immunity to levels necessary to stop indigenous type 1 polio in India
- ✓ *Key to success: reaching all children multiple times with mOPV1!*

Study results:

The study confirms the increased efficacy of mOPV1 over trivalent OPV against type 1 polio. In a field study in Uttar Pradesh, India (one of only two remaining endemic states in India), mOPV1 was shown to be three times more effective than trivalent OPV at protecting children against type 1 polio. The study estimates that 30% of children in this key area of persistent wild poliovirus transmission are fully protected against type 1 polio after a single dose of mOPV1 compared to only 11% of children after a single dose of trivalent OPV.

Interpretation and significance:

Uttar Pradesh is arguably one of the most difficult places on earth to eradicate polio, due to a number of programmatic and environmental challenges, including low levels of routine immunization services, inadequate sanitation infrastructure, high population density and large birth cohorts. Oral polio vaccines have been shown to be less effective in areas such as Uttar Pradesh, due to high prevalence of diarrhoeal disease and other intestinal infections thus facilitating intense transmission of wild poliovirus. Due to the specific environmental challenges and compromised efficacy of trivalent OPV in Uttar Pradesh, poliovirus transmission has continued to persist, despite high vaccination coverage with trivalent OPV.

¹ Grassly NC et al, *Protective efficacy of a monovalent oral type 1 poliovirus vaccine: a case-control study*, The Lancet, 12 April 2007.

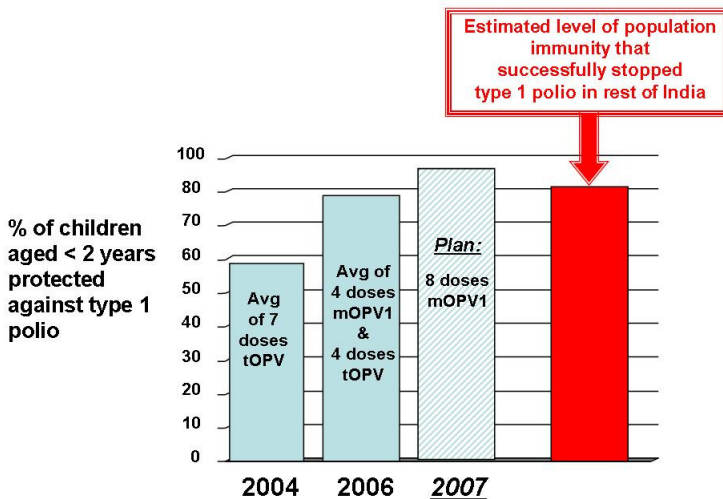
NOW, MORE THAN EVER: STOP POLIO FOREVER.



Partners in the Global Polio Eradication Initiative

Vaccination coverage versus population immunity:

Due to the challenging conditions in Uttar Pradesh, higher levels of population immunity are required to interrupt polio transmission than were required in the rest of India. It is estimated that on average 7 doses of trivalent OPV among children aged 0-23 months in other parts of India succeeded in protecting at least 80% against paralysis and interrupted poliovirus transmission, compared to only 59% protected in Uttar Pradesh at the end of 2004.



mOPV1 use: markedly increases population immunity with same number of doses

The study shows that much higher levels of population immunity can be achieved using mOPV1 with the same vaccination coverage compared to use of trivalent OPV, resulting in a dramatically compounded impact on population immunity levels. It is estimated that on average 4 doses of mOPV1 and 4 doses of trivalent OPV resulted in 79-82% of children being protected at the end of 2006,

compared with only 59% of children protected by 7 doses of trivalent OPV alone. In 2007, an aggressive new tailored approach to eradication was launched in the country aiming to administer 8 doses of mOPV1 to every child aged 0-23 months in the remaining endemic areas of the country. Based on the study results, this plan would lead to a level of population immunity *greater than* that achieved in the other areas of India that have already eradicated the disease. This is extremely significant, as it suggests that repeated and large-scale administration of mOPV1 could now rapidly interrupt the remaining chains of type 1 polio transmission for the first time ever in these areas of India.

Additional information:

Of further significance is the fact that in most areas of western Uttar Pradesh, including in the five traditionally highest-risk districts centred around Moradabad, no new cases of type 1 polio have occurred since October 2006. While it is too early to say if type 1 polio transmission has been successfully interrupted in these highest-risk districts of western Uttar Pradesh, it is clear that the levels of population immunity have been significantly increased in these areas in the latter half of 2006.

Key to rapid success in India is now to further increase the quality of large-scale polio immunization campaigns to reach every child with mOPV1, and sustain these levels until transmission has been successfully interrupted throughout the country. mOPV1 may prove to be one of the most important new tools in finishing the job of polio eradication, and protecting the global US\$5 billion investment made in the Global Polio Eradication Initiative.