

Unvaccinated children rather than lack of effective vaccines is hindering the elimination of polio in Pakistan and Afgha

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Too few children have received sufficient doses of vaccine to wipe out polio in Pakistan and Afghanistan, two of only three countries in the world where endemic polio has yet to be eliminated, according to new research published online first in the *Lancet*. The findings suggest that the newly introduced bivalent oral poliovirus vaccine has the potential to eliminate polio in these countries if sufficient numbers of children could be reached by vaccination programs.

"In 2011, in the worst affected regions of Pakistan and southern Afghanistan, an estimated 40% of children under age 3 were unprotected against type 1, the predominant circulating wild poliovirus", explains Kathleen O'Reilly from Imperial College London, UK, who led the research. "One of the reasons for the low vaccination coverage is access to all populations due to insecurity, in particular in some parts of Southern Region in Afghanistan, and Federally Administered Tribal Areas (FATA) in Pakistan. These regions are a potential reservoir for the virus into polio-free countries, jeopardising worldwide polio eradication."*

Despite mass immunisation campaigns and the introduction of the more effective bivalent OPV in Pakistan and Afghanistan in 2009, incidence of [virus type](#) 1 has increased. In 2011, [polio](#) cases in Pakistan reached a decade high.

Using vaccination history data from almost 47 000 children with acute flaccid paralysis between January 2001 and December 31 2011, O'Reilly and colleagues estimated vaccination coverage, the protection offered by OPVs, and examined their association with incidence of poliomyelitis over the study period in seven regions of Pakistan and Afghanistan.

Their findings indicate that with each dose of the bivalent OPV received, there was a greater than 23% chance of being protected against type 1 poliomyelitis, compared with about a 35% chance with the monovalent OPV, and around a 13% chance with the trivalent OPV.

But despite the bivalent and monovalent OPV proving very effective, limited access to children during recent vaccination campaigns has severely limited the effect of these vaccines, they say: "Substantial drops in vaccination coverage during 2006-07 in FATA, Balochistan, and Khyber Pakhtunkhwa in Pakistan, and in southern Afghanistan, have resulted in lower vaccine-induced population immunity and resulted in an increase in the incidence of poliomyelitis during 2010-11."*

In contrast, in regions outside of southern Afghanistan that are free from conflict, where both routine immunisation services and supplementary immunisation activities have been able to reach the majority of children, there has been a consistently high percentage of children receiving more than three doses of the OPV. These areas have experienced significant increases in population immunity during the study period.

The researchers conclude: "If [vaccination coverage](#) during the two trivalent and four bivalent OPV campaigns planned in Afghanistan and Pakistan in 2012 could be increased to at least 80%, and if persistently missed children could be reached by the programme, the proportion of unprotected [children](#) would decrease to less than 10% and eradication would become feasible."

In a linked Comment, Philip Minor from the Health Protection Agency in the UK says: "These results provide an example of the need to tailor immunisation programmes to epidemiological circumstances, particularly where the goal is eradication."

More information: Paper: [www.thelancet.com/journals/lan ... \(12\)60648-5/abstract](http://www.thelancet.com/journals/lan/article/S0140-6736(12)60648-5/abstract)

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