

Report on the

Technical Consultation on Polio Eradication in Pakistan

Cairo, Egypt
10 October 2008



**World Health
Organization**

Regional Office for the Eastern Mediterranean

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1. INTRODUCTION

A technical consultation on poliomyelitis eradication in Pakistan was held at the WHO Regional Office for the Eastern Mediterranean (WHO/EMRO) on 10 October 2008 under the chairmanship of Dr Nicholas Ward, Chairman of the Technical Advisory Group on Polio Eradication in Pakistan. The consultation was attended by a number of experts and WHO staff from Pakistan, the Regional Office and headquarters. The programme and list of participants are attached as Annexes 1 and 2, respectively.

The Chairman welcomed the participants and indicated that the objective of the consultation was to review the reasons behind the recent unanticipated upsurge of cases of poliomyelitis in Pakistan and to advise on ways to address the situation.

Dr Hussein Gezairy, WHO Regional Director for the Eastern Mediterranean, addressed the consultation and referred to the considerable efforts to improve the quality of surveillance and campaigns and the exceptional advocacy efforts which were behind the achievements made in the programme. These efforts had resulted in the decrease in the annual number of cases from thousands at the time of initiation of the programme in Pakistan in 1993 to the lowest ever reported number of cases in 2005 (28 cases), to 40 cases in 2006 and 32 in 2007. Political and security developments in the past 12 months had likely contributed to the observed increase in the number of cases during 2008. He requested the consultation to base its recommendations on evidence and on experiences and to consider the lessons learned in the present upsurge of cases.

2. REVIEW OF THE SITUATION OF POLIO IN PAKISTAN

2.1 Epidemiological situation

Dr M. H. Wahdan, WHO/EMRO

Pakistan is in the grip of an epidemic, as shown by the sharp increase in the number of cases of polio since the month of July. It is difficult to anticipate the magnitude of the epidemic, as it is now the high transmission season and because of the large number of districts which are now affected, particularly in Punjab. The epidemiological picture and factors behind the developments differ between the various provinces.

The central and northern parts of Punjab which have been polio free since 2005 and were known to have a good level of routine immunization, supplemented by 5 rounds of national immunization day campaigns (NIDs), were considered at low risk and so were not included in all supplementary immunization activities in 2007 and particularly in 2008. Up to August 2008, central and north Punjab were included in only 2 NIDs. This, coupled with the recent deterioration of routine immunization in Punjab, resulted in the creation of an immunity gap in the young children in these areas. The large-scale population movements from security-compromised areas to different parts of Pakistan, including Punjab, introduced the wild virus and hence the outbreak. It is noted that southern Punjab has not been involved in the present epidemic as no immunity gap existed due to frequent supplementary immunization activities.

In Sindh, the situation is different. Most of the cases that occurred in the first 6 months of 2008 in Pakistan were in Sindh, where there have been significant political and programmatic problems since 2007 and early 2008. It is also noted that half the cases that happened in Sindh were in districts which were included in some but not all of the supplementary immunization activities.

The special attention given to improving performance in Sindh since February 2008 and the success in achieving strong engagement of the authorities resulted in tangible improvement in immunization coverage, and hence the marginal involvement of Sindh in the present epidemic spread in the second half of 2008.

NWFP/FATA witnessed the largest number of cases in the present epidemic. In addition to endemic circulation, NWFP was subject to importation from Karachi and from neighbouring areas of Afghanistan. As well, the significant population movement from security-compromised reservoir areas which have been inaccessible for several months had an impact on the epidemiological situation in the province. The worst hit district in the whole of Pakistan in this epidemic is Peshawar, where all the cases were caused by WPV3, after more than 3 years without cases due to this virus. The repeated and consecutive administration of mOPV1 during the period from May 2007 to April 2008 in Peshawar is probably behind the spread of WPV3 in this district. Also, NWFP districts which were included in some but not all supplementary immunization activities, such as the Hazara region, reported cases after long periods of freedom from polio.

In Baluchistan, there is strong epidemiological link with southern Afghanistan. The increase in cases is mainly linked to the continued endemic situation in the province and sub-optimal supplementary immunization activities.

In Islamabad, after 5 years of freedom from polio, the occurrence of 5 cases in the past few months is a reflection of the creation of an immunity gap due to involvement of Islamabad in only some and not all NIDs conducted in Pakistan in 2007 and 2008.

The present epidemic is therefore the result of a combination of several factors which have unfortunately accumulated, particularly during the past 12 months, resulting in the creation of pools of children who have not received adequate doses of OPV to render them immune against the two types of wild viruses circulating in Pakistan and neighbouring Afghanistan.

These factors include:

- Difficulties in accessing children in areas of conflict for long periods which has permitted continued viral circulation. The recent significant population movement out of these areas to other parts of Pakistan was accompanied with viral spread.
- Recent political development resulting in significant changes in health leadership.
- Poor quality work in a number of areas which are not affected by limited access.
- Weak routine immunization and particularly, the deterioration during 2008 when it was coupled with shortage of vaccines for few months.
- Efforts to stop WPV transmission in high risk areas have not succeeded to achieve this target despite the deployment of additional resources for these areas again because the

quality of work in these areas was insufficient to ensure immunizing all children in these critical areas.

- The false assumption that areas which were not labelled as high risk are relatively safe and hence complacency and a reduction in the frequency of including them in supplementary immunization activities. This has led to the creation of a status of insufficient immunity in children living in these areas and hence there was no barrier to prevent the spread of WPVs when introduced from endemic areas.
- Intensive use of mOPV1 repeatedly replacing tOPV in areas which had WPV1 resulted in inadequate immunity against WPV3 which is still circulating in several parts of Pakistan and Afghanistan.

2.2 Epidemiological features of polio cases

Dr Nima Abid, Team Leader, Polio Eradication, WHO Pakistan

Epidemiological characterization of cases showed that:

- 70% were under 24 months almost half of them under the age of 1 year
- Half the cases (53%) received zero routine doses, but 46% received 7 or more doses (routine + supplementary immunization)
- 57% are Pashto speaking.

Inaccessibility of children is an ongoing problem in the various supplementary immunization activities. The problem was particularly notable in the August round, where the number of missed children in NWFP/FATA was 650 595, more than 12% of the under-5 population of the province.

Steps taken since July to address the situation include the following.

- Enhancing efforts to improve accessibility and limit refusals through intensified advocacy with political and religious leaders as well as fighting factions.
- Immediate case response to confirmed cases in newly infected areas through large mop ups generally using mOPV.
- Additional supplementary immunization activities conducted on 15–17 September covering Punjab, parts of Baluchistan, NWFP and Islamabad.
- Vaccination of all internally displaced persons from Bajour and other conflict affected agencies and districts in NWFP/FATA.
- Regular sharing of information with all stakeholders including a daily report.

2.3 Oral poliovirus vaccine effectiveness and vaccine-induced immunity in Pakistan

Dr Nicholas Grassly, Imperial College, London

Data about the reported number of doses of OPV vaccine among AFP cases since 1997 were analysed to estimate efficacy of monovalent and trivalent OPV against polio viruses 1 and 3 and to estimate vaccine induced population immunity. The procedure used to assess vaccine efficacy, through case–control study matched by age and location, found that the efficacy of a

dose of monovalent type 1 vaccine is nearly double that of a trivalent dose (44% and 23% respectively).

Limitations of the analysis included misreporting of dose numbers and quality of supplementary immunization activities.

2.4 Seroprevalence surveys: past uses and potential applications

Dr Steve Cochi, Centers for Disease Control and Prevention (CDC), Atlanta

Sero surveys require all necessary reviews and clearances, and interpretation of their results depends on their design. They can give a snapshot of programme performance. A number of sero surveys have been conducted in recent years (Egypt 2004, Indonesia 2005 and India 2007). Although they provided important data that could guide programmatic action, their results must be interpreted with caution as they refer to selected groups (clinical population) which do not represent the general population.

With regard to the proposed sero survey in Pakistan, Dr Cochi made the following remarks.

- The objective would be to assess whether vaccines given have induced immunity.
- The survey could highlight the immunity profile against poliovirus among infants aged 6–11 months (highest risk group) residing in low socioeconomic areas and if possible stratified by ethnic group.
- The proposed design for Pakistan would be as follows:
 - Total sample size = 1200
 - Enrol 100 infants each aged 6–11 months and 36–47 months in 2 sites in the lowest socioeconomic standard areas of Karachi (Pashtun and Krachi ethnic group), in NWFP (Afghan and NWFP residents) and in Punjab (rural and urban residents).
 - A single blood specimen needs to be collected and data collected through a questionnaire.
 - Large hospitals that are frequented by the targeted subjects would be identified as the sites for enrolment in the study.
 - The test to be used is the neutralization test; it could be done by CDC.

3. CONCLUSIONS

After a careful review of the recent polio epidemiological and eradication activities in Pakistan, the consultation concluded the following.

- Pakistan is in the grip of an epidemic of polio with the most explosive spread being WPV1 in Punjab and WVP3 in NWFP. It must be assumed that WPV1 and WPV3 are widespread throughout the country.
- The recent upsurge of cases was due to a confluence of several factors including:
 - Persistent transmission in key reservoir areas despite deploying resources, extra supplementary immunization rounds and advocacy efforts. Failure to achieve cessation of transmission in these areas is mainly a reflection of the quality of work, which was

- insufficient to ensure and achieve immunization of all children during supplementary immunization activities.
- Deterioration of the security situation in some key reservoir areas in NWFP resulting in a decrease in campaign quality and intensification of transmission in these areas. The large-scale population movement from security-compromised areas to previously polio-free areas was accompanied by the introduction of wild polioviruses.
 - Increase in population susceptibility in polio-free areas due to recent reduction in the number of polio campaigns and the deterioration in routine immunization services.
 - Intensive use of the same monovalent OPV, occasionally and repeatedly replacing the use of trivalent OPV in the efforts to stop WPV transmission in high risk areas. This clearly carried the risk of inadequate immunity against the other wild virus, hence facilitating its spread.
- Although the present epidemiological situation is disappointing, it is not disastrous. Provided remedial measures are promptly and thoroughly introduced, the epidemic can be controlled.

4. RECOMMENDATIONS

The expert consultation recommended that for the next critical 24-month period, the previous high-risk approach and language should be replaced by the following tactics.

1. From now on, all Pakistan must be considered at risk of WPV transmission. Consequently, the number of nation wide NIDs should be increased from 4 to at least 6 rounds every year (i.e. one round every two months). The primary tool should be tOPV.
2. Monovalent OPV (mOPV) should be used as a means of augmenting the immune response to tOPV and should be given in NIDs or large-scale SNIDs that supplement the tOPV NIDS described above to close any residual immunity gaps. Outbreak response should be implemented immediately in any re-infected areas using the appropriate mOPV. These rounds should be implemented in addition to the tOPV NIDs, and hence, operationally would be conducted in the months between the tOPV NIDs outlined in item 1 above.
3. The strategy for reservoir areas should follow that of the re-infected areas with additional rounds conducted between the NIDs. Particular attention must be given to achieving very high coverage in these areas during all supplementary immunization activities. The recent experience from Sindh, namely the establishment of a provincial task force headed by Chief Secretary, demonstrated that full engagement of the Government and assigning full accountability for campaign quality to district administrative staff can result in tangible gains in achieving high immunization coverage. This should be the direction to be adopted all over Pakistan.
4. The planned November 2008 NID should be utilized for collection of detailed data on supplementary immunization performance and intensive evaluation through national and international assessors. In addition to this process evaluation, independent monitoring of the outcome should be made relying on finger marking as the main indicator. The outcome of

this assessment should be utilized to prepare a new plan of action for 2009 to be publicly declared by the highest possible authorities in Pakistan.

5. Environmental monitoring should be introduced starting with large cities (e.g. Karachi and Lahore) to better understand the transmission pattern of wild viruses.
6. Rapid sero surveys should be conducted to assess serological response to immunization.

The consultation indicated that the studies under 5 and 6 above should be commissioned to institutions to avoid distracting programme staff from their main responsibilities.

Annex 1

PROGRAMME

Friday, 10 October 2008

- | | |
|-------------|--|
| 09:00–09:15 | Registration |
| 09:15–09:30 | Opening remarks by Dr Hussein A. Gezairy, RD, WHO/EMRO |
| 09:30–10:30 | Epidemiological situation in Pakistan: presentation and discussion/Dr M. H. Wahdan |
| 10:30–10:50 | Comments of Team Leaders, Pakistan/Dr Nima Abid |
| 10:50–11:10 | Mathematical modelling and its use in strategic approaches for polio eradication/Dr Nicholas Grassly |
| 11:10–13:30 | Discussion on questions for the consultation/Dr Nicholas Ward |
| 13:30–14:30 | Seroprevalence surveys: past uses and potential application/Dr Steve Cochi |
| 14:30–15:30 | Conclusion and recommendations of the consultation |

Annex 2

LIST OF PARTICIPANTS

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