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**Progress report on
Eradication of poliomyelitis**

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1. Introduction

In response to a resolution of the 61st World Health Assembly in 2008 (WHA 61.1) calling for a new plan to complete the polio eradication efforts, the Eastern Mediterranean Region contributed significantly to the efforts to examine new approaches to reaching children who have been repeatedly missed during supplemental immunization activities and in the independent evaluation of the major barriers to interrupting wild polio virus transmission that took place in the second half of 2009. The outcome of these efforts was fundamental in shaping regional efforts in 2010 and in developing the global strategic plan for polio eradication 2010–2012.

As a result of the regional efforts in 2009, 19 countries maintained their polio-free status during the year. In addition, the last case of polio discovered in south Sudan was in June 2009; since then wild polioviruses are only circulating in the two endemic countries of the Region, Afghanistan and Pakistan.

2. Current situation in the Eastern Mediterranean Region

2.1 Situation in Pakistan

In Pakistan, wild poliovirus transmission is restricted to three transmission zones comprising groups of districts/agencies/towns. These are in Sindh (3 towns of Karachi [Gadap, Baladia and Gulshan E. Iqbal]), in Baluchistan (the 3 adjoining districts of Quetta, Pishine and Kila Abdullah, collectively known as the Quetta block) and in the tribal agencies, especially Khyber and Bajour in Federally Administered Tribal Areas (FATA) and Peshawar in North West Frontier Province (NWFP). Only 15 of the 155 districts/agencies/towns have persistent transmission or are at high risk. From these reservoirs, the indigenous viruses have recurrently re-infected other polio-free parts of the country, resulting usually in sporadic cases.

In 2009, Pakistan reported a total of 89 polio cases, including 60 type-1, 28 type-3 and one case which is a mixture of both type-1 and type-3 polioviruses. These cases were reported from 34 districts, which means that 78% of the districts in 2009 did not have polio cases and large populations live in polio-free areas. More than half (56%) of the polio cases were from insecure areas, including 20 from Swat and 15 cases from Bajour Agency.

Efforts to achieve polio eradication in Pakistan have been hampered in some areas of NWFP/FATA and Baluchistan by insecurity and active conflict, affecting access to children and resulting in substantial population movement, and in other areas by poor management and inadequate implementation of the polio eradication strategies, as is the case in some districts in Baluchistan and Karachi towns.

The commitment of the Government of Pakistan to polio eradication is high, as illustrated by the personal engagement of H.E. Mr Asif Ali Zardari, President of Pakistan, who inaugurated the National Immunization Days, and the nomination of his daughter Ms Assefa Bhutto Zardari as Ambassador for polio. The Prime Minister has launched a robust action plan to eradicate polio, with the result that more sectors are actively supporting the programme than ever before. An Interprovincial Ministerial Committee for Polio, chaired by the Federal Minister of Health, was established and is meeting regularly. However, commitment of the district leadership is not consistent with the high commitment at the provincial and national levels. More focus is being placed on holding district authorities accountable for their performance, with regular feedback to provinces and districts highlighting performance gaps. This has been possible after the introduction of independent monitoring of supplementary immunization activities based on objectively verifiable finger-marking coverage. These credible coverage data align closely with the distribution of wild poliovirus. A system of pay for performance will be implemented.

As part of the advocacy efforts, the Regional Director visited Pakistan and met with HE Mr Syed Youssef Raza Gillani, Prime Minister, who reaffirmed government commitment to the goal of polio eradication and actions to address remaining gaps.

At the end of 2009 there were only 9 districts with persistent transmission and 6 with intermittent re-infection. These 15 highest risk districts/towns/agencies have further localization of high risk areas and populations within them. Ongoing circulation in these small areas poses risk of spread of virus to other areas. The majority of the cases in 2010 have been from these well-identified zones of transmission. Enhanced performance in these highest risk areas offers clear opportunities for Pakistan to stop poliovirus circulation. Comprehensive plans with targets for the next three years (2010–2012) were developed and approved by the Interprovincial Ministerial Committee for Polio.

2.2 Situation in Afghanistan

Most of Afghanistan is polio-free. Persistent wild poliovirus transmission is now restricted to 13 security-compromised districts in the provinces of Helmand, Kandahar and Uruzgan in the conflict zone in the south, where the precarious security situation is limiting access to children for vaccination.

Afghanistan reported 38 (15 P1 and 22 P3 and one mixed P1 and P3) polio cases in 2009, 34 of which were from the southern region. All cases reported since July 2009 (except one) were P3, reflecting periods of predominantly P1 circulation and others P3 circulation.

The political commitment of the Government of Afghanistan in support of the programme is clearly evident and all partners are continuing their efforts to improve accessibility. These efforts include requests to military groups to continue to “de-conflict” the situation during campaign days in the areas of vaccination activity and coordination with the International Committee of the Red Cross to maintain the cooperation of anti-government elements through their letters of support. In southern Afghanistan, new approaches to improve access to children include recruiting “local access negotiators” to work with all parties in the conflict and contracting the local nongovernmental agencies responsible for delivering the basic package of health services in these areas to implement supplementary immunization activities. These approaches have led to increased access, particularly during some supplementary immunization activities in the second half of 2009. However, access continues to fluctuate from round to round and more efforts are still needed to ensure campaign quality in order to interrupt virus transmission. Specific plans were developed for the 13 districts with persistent transmission with the aim of scaling up promising approaches. At the same time, efforts are continuing to sustain good coverage in all accessible areas.

Cross-border coordination between the Afghanistan and Pakistan programmes is exemplary and aims to optimize coverage of the border areas and of children on the move. Almost two million children under 5 years were vaccinated in 2009, at 11 border vaccination posts. Dates of vaccination campaigns are synchronized and information sharing between two countries is a regular feature.

2.3 Situation in Sudan

The outbreak that started in south Sudan in 2008 resulted in 24 cases in 2008 and 40 cases in 2009 (date of onset of the last polio case was 27 June). Cases were reported from 9 of the 10 states of south Sudan (all except West Bahr el Gazal) with spread to northern Sudan and neighbouring parts of Kenya and Uganda. Actions were taken to curb the outbreak including enhancing technical and logistic support, reviewing and updating plans for supplementary immunization activities, enhancing surveillance and strengthening local government commitment. One of the important

developments in this regard is the establishment of the Presidential Action Plan and interministerial committee (and hence involving top officials in support of campaigns) and ensuring coordination of actions by all partners. Supplementary immunization activities using mainly mOPV1 have been conducted since May 2008 and are synchronized with similar activities in neighbouring countries. Efforts are now concentrated on further strengthening surveillance and verifying interruption of virus transmission.

3. Implementation of polio eradication strategies

3.1 Routine immunization

Many of the countries of the Region have successfully stopped poliovirus circulation through ensuring high routine immunization coverage of infants. The crucial role of high routine coverage in maintaining achievements and in preventing the spread of poliovirus after importation has been clearly documented in the Region. At the same time, importations to countries and communities with low routine coverage were noted to have resulted in outbreaks.

Recognizing the basic role of routine immunization in polio eradication, field staff of polio eradication programme continue to support and strengthen routine immunization. As well, the capacities developed by the polio eradication programme in micro-planning, campaign implementation, monitoring and evaluation have been very useful in strengthening routine immunization activities.

3.2 Supplementary immunization activities

Supplementary immunization activities are meant to supplement routine immunization, particularly in countries with low routine coverage, with the aim of ensuring that all children under 5 years are immunized against polio.

In 2009, Afghanistan and Pakistan carried out supplementary immunization activities throughout the year at nearly 4–6 week intervals. Mop-up activities were also implemented in response to wild poliovirus isolation in Afghanistan, Pakistan and Sudan using the appropriate monovalent oral poliovaccine (OPV). The polio-free status of other countries is being sustained by avoiding the development of immunity gaps among children through improvement of routine immunization and implementation of supplementary immunization activities, especially in foci of low immunization coverage. Population immunity of children 6–23 months is being regularly monitored through analysing immunization history of AFP cases. In this regard, some polio-free countries (Djibouti, Egypt, Iran, Iraq, Jordan, Libyan Arab Jamahiriya, Saudi Arabia, Somalia, Syrian Arab Republic and Yemen) conducted campaigns in 2009 addressing mainly high-risk areas and areas with low routine coverage. As well, other campaigns reaching children, such as Child Health Days and measles elimination campaigns, are used to deliver additional doses of OPV.

Supplementary immunization campaigns continued to be conducted essentially from house to house, targeting all children under 5 years of age. Detailed microplanning is conducted to ensure high campaign quality, including efforts to ensure the commitment and support of politicians and various community leaders and other governmental and nongovernmental organizations. Special attention is given to risky areas and difficult-to-reach groups. In certain situations, monovalent vaccines were used to maximize type-specific immune response. Since late 2009, bivalent OPV was used for the first time against both type 1 and type 3 viruses in Afghanistan, followed by other countries including Pakistan. This vaccine has the advantage of giving good immune response against both types of virus simultaneously. Independent monitors are being recruited for proper assessment of the process and outcome of the supplementary immunization activities, and finger-marking is being used to verify coverage and to guarantee that no child was missed.

Findings of independent monitors are immediately relayed to the responsible authorities for appropriate action. NIDs were coordinated between neighbouring countries and supplementary immunization activities were also used to provide other services, such as delivering life-saving vitamin A and deworming tablets.

3.3 Surveillance for acute flaccid paralysis

The surveillance system for acute flaccid paralysis (AFP) in the Region continues to perform at the accepted international standard. It is being used to document achievements with respect to wild virus transmission and to direct operations to address continued transmission. Endemic and recently polio-free countries have maintained a non-polio AFP rate of at least 2 cases per 100 000 children under the age of 15. The same standard was achieved in many other countries, particularly the ones at high risk of importation. All polio-free countries of the Region except Lebanon reported more than the minimum required level of 1 case per 100 000 children under the age of 15 years.

The second quality indicator for surveillance (percentage of AFP cases with adequate stool collection) was maintained above the target of 80% at the regional level (91.08%) and in every country of the Region except Djibouti, Kuwait, Lebanon and Morocco, where it was slightly lower than the target.

All countries continue to provide AFP surveillance data on a weekly basis to the Regional Office, where they are analysed and published in the weekly polio fax sent to all countries. In addition, independent assessment of surveillance (surveillance reviews) are implemented to assess the quality of AFP surveillance. These reviews showed, in general, that the surveillance systems are adequate enough to detect any circulating poliovirus or importation. The Regional Office is following up closely the implementation of the recommendations of these reviews and a new round of reviews is planned in 2010 to be followed by training courses to address any gaps observed during the reviews. Supplementary surveillance activities, namely environmental monitoring, continue to be implemented in Egypt. Environmental monitoring was established in 2009 in several sites in Pakistan.

The Regional Office is regularly updating the Information for Action database. The new version includes a component for data on samples collected from contacts of selected AFP cases. Analysis of these data was added to the weekly polio fax in 2009.

3.4 Regional laboratory network

The polio network laboratories continue to support AFP surveillance activities efficiently all over the Region. All network laboratories passed the WHO proficiency panel tests for both poliovirus isolation and intratypic differentiation (ITD) testing and all laboratories are fully accredited except the Kuwait laboratory, which is provisionally accredited.

The workload of the network laboratories is considerable. During 2009 the polio network laboratories processed 24912 specimens from cases and contacts, and the workload continues to be at the same level in 2010. Contact sampling of AFP cases is performed in 20 of 22 countries. In 2008 and 2009, 13 and 14 cases due to wild poliovirus were detected through positive contact of virus negative index cases, respectively. The average reporting time from sample receipt in laboratory to final ITD results decreased from 12 days in 2008 to 10 days in 2009. Overall, 94% of specimens had culture results within 14 days, 95 % had ITD results within 7 days of virus culture positive referral and in 97% of AFP cases, the final laboratory testing results were provided within 45 days of paralysis onset.

In order to establish the real-time PCR method for rapid characterization of polioviruses in the polio intratypic laboratories, a training workshop was held in January 2009 at the national polio

laboratory in Muscat, Oman. This was followed by full implementation in three countries (Egypt, Islamic Republic of Iran and Pakistan), while standardization is in progress in the remaining four laboratories (Kuwait, Morocco, Oman and Tunisia). New LABIFA software (version 4.1) was developed to include changes due to the introduction of real-time PCR and was distributed in 2009.

During 2009, vaccine-derived polioviruses (VDPV) were isolated from AFP cases in Afghanistan and Somalia. The 6 cases in Somalia are considered cVDPV.

The regional reference laboratory in Pakistan continued to perform at exceptionally high standard, serving both Afghanistan and Pakistan. Genomic sequencing of isolated viruses from both countries is also done in the laboratory and is showing an evident decrease in genetic diversity of polioviruses.

Egypt which had its last confirmed polio case in may 2004, continues to collect sewage samples from 34 sites covering all governorates and performance is continuously monitored through NPEV and Sabin virus isolation. A significant achievement was the establishment in 2009 of a fully functional environmental surveillance laboratory in Pakistan, where sewage samples are being analysed from the provinces of Sindh (Karachi) and Punjab (Lahore) in order to improve understanding of the circulation of WPVs and target the areas for immunization activities.

The laboratory infrastructure developed for polio eradication in the Region is proving to be beneficial for supporting pandemic (H1N1) 2009 laboratory diagnostic work. In this regard, sharing of laboratory personnel and/or equipment for detection of influenza viruses has been documented in four laboratories (Iraq, Kuwait, Oman and Pakistan).

3.5 Improving the quality of life of polio victims

Poliomyelitis survivors are one of the largest groups with physical disability in the world. WHO estimates that worldwide there are between 10 and 20 million polio survivors living with physical disabilities.

It is essential to provide polio patients with the treatments needed for rehabilitation, namely physiotherapy, orthotics and corrective devices, in order to optimize their functional mobility. In some cases, surgical interventions may also be needed.

The Regional Office, in collaboration with the International Islamic Relief Organization (IIRO), has established a programme for improving the quality of life of children suffering from polio-related disabilities in Yemen and Pakistan, where there are a significant number of cases of post-polio paralysis following the epidemic of 2005 in Yemen and the continued endemicity in Pakistan. The specific objectives of this programme are to enhance the mobility and dignity of children suffering from disabilities resulting from polio and to facilitate their integration as productive members of society.

So far, the programme is covering 119 polio survivors in Pakistan and 144 in Yemen and is providing them with various types of orthotic supports. The orthotic devices used are manufactured locally. In Pakistan, in addition to rehabilitation, arrangements have been made for schooling of those patients who are school aged, including covering school fees, uniforms and books. It is sincerely hoped that this programme will be continued, and that all former patients with polio-related disability can be identified and the necessary support provided, both institutional and community-based.

4. End-game issues

4.1 Laboratory containment of wild poliovirus and potential infectious material

The major objective of laboratory containment is to minimize the post eradication risk of reintroducing wild polioviruses or Sabin strains from the laboratory to the community, at a time when OPV use has stopped. This can be achieved through national destruction and prohibition of poliovirus material except in essential facilities in a minimum number of countries, and management of the risk of essential facilities through the primary safeguards of containment and secondary safeguards of location.

Nineteen countries (Bahrain, Djibouti, Egypt, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syrian Arab Republic, Sudan, Tunisia, United Arab Emirates and Yemen) have reported completion of the first phase of laboratory survey and inventory activities. Afghanistan, Pakistan and Somalia are expected to initiate preparations for Phase 1 laboratory survey and inventory of laboratories for containment of wild poliovirus and potentially infectious material.

Documentation of the quality of Phase 1 containment activities was submitted by all countries that have completed phase 1 activities except Palestine.

Currently, the Global Action Plan III (GAP-III) draft is available and official adoption will await review by the World Health Assembly.

4.2 Certification of poliomyelitis eradication

The Regional Commission for Certification of Poliomyelitis Eradication held two meetings during 2009 during which various national documents submitted by the National Certification Committees of countries in the Region were reviewed. Basic documents have been accepted from all countries except Afghanistan and Pakistan, which are still endemic, and Sudan, which was requested by the RCC to re-submit its report in view of the recent virus circulation. All countries will continue to submit annual updates until regional certification has taken place.

5. Technical and financial support to countries

WHO technical support to the regional polio eradication programme has been maintained through the recruitment of 56 international staff supported by another 27 short-term (3 months) STOP Team members seconded by the U.S. Centers for Disease Control and Prevention, 14 national professional officers and 246 national medical officers supported by more than 700 other national staff. In addition, teams of experts constituting both regional and country TAGs extend technical support to the national programmes on strategic directions. It is to be noted that all polio staff are extending support to the Expanded Programme on Immunization, for example for measles elimination, as well as helping to address other priority health programmes at country level.

As well, the established laboratory network for polio eradication is now extending laboratory services for vaccine-preventable diseases and other diseases of public health importance.

Members States of the Region continued to provide significant resources for the eradication efforts, particularly with respect to routine immunization. In addition, considerable external financial resources were secured to support national activities, especially the provision of operational expenses and technical support and required resources to continue surveillance activities. The external resources provided to support the planned activities through WHO for 2009, have exceeded the planned US\$ 62 million.

The main contributors to these funds were the UK Department for International Development (DFID), Rotary International, The World Bank, GAVI Alliance, Government of the United States of America, Bill and Melinda Gates Foundation, United Nations Foundation, the Government of

Canada, the European Community, and Governments of Kuwait, Russia, France, Germany, Saudi Arabia and United Arab Emirates.

6. Coordination with other Regions

Coordination of polio eradication activities between countries of the Region and neighbouring countries of other WHO regions is continuing. This coordination is being implemented in several ways including the organization of coordination meetings, e.g. for the Horn of Africa countries, and issuance of the Horn of Africa bulletin. As well, the Horn of Africa Technical Advisory Group meets regularly every year. Synchronization of activities and direct exchange of information between countries, together with direct coordination at local level, have improved considerably. Operation MECACAR to fight polio is continuing between neighbouring countries of the Eastern Mediterranean and European regions, in line with the declaration signed in 2007. The scope of MECACAR is now extending to include measles elimination and routine immunization as well.

7. Regional commitment for polio eradication

Regional commitment for the poliomyelitis eradication goal continues to be at its highest level, with national authorities in both endemic and polio-free countries showing great commitment. The Regional Committee receives annual progress reports. The progressive guidance reflected in resolutions of the Regional Committee are the driving force towards achieving this goal. The Regional Director continues advocacy efforts for polio eradication and routine immunization. In 2009 he paid visits to priority countries and met with Heads of State, Prime Ministers, Ministers of Health and other senior and influential nationals, who assured him of their continuing commitment to the eradication efforts.

8. Challenges and future directions

The main challenges facing the programme include:

- Continued transmission in Afghanistan and Pakistan, especially in shared transmission zones where access to children is compromised by insecurity in some areas and by traditional cultures, refusals and suboptimal quality of supplementary immunization activities in other areas;
- Inadequate engagement of national leadership at the province and district levels to address chronic problems of low quality of immunization and campaigns in some polio infected areas;
- The immunity gap among children in south Sudan, which is caused by poor routine immunization and sub-optimal quality of supplementary immunization activities and threatens achievements, particularly as wild poliovirus is still circulating in neighbouring African countries;
- The risk of cVDPV in countries with poor routine immunization, particularly in Somalia;
- Maintaining the interest and commitment of national authorities at all levels, particularly in the polio-free countries;
- Securing the necessary external resources to complement national resources.

To address these challenges and achieve the milestones of the Global Polio Eradication Plan 2010–2012, the regional priorities for polio eradication during 2010 are as follows.

1. Interrupt transmission in Pakistan and Afghanistan through intensification of supplementary immunization activities, ensuring access to children in the security compromised areas, addressing managerial issues, ensuring high quality performance and making use of the new tools as bOPV.
2. Address all problems and constraints, particularly in Somalia and Sudan, especially in the south, in order to maintain achievements.

3. Avoid the development of large immunity gaps in polio-free countries; through maintenance of high levels of routine immunization and implementation of required supplementary immunization activities in foci of low population immunity.
4. Maintain certification-standard surveillance in all countries, both at national and subnational levels and particularly among high risk areas/populations.
5. Maintain and further strengthen coordination activities between neighbouring countries within the Region and with neighbouring countries of other regions to ensure synchronization and exchange of information and local level planning and coordination.
6. Maintain the polio laboratory network and promote its use for other relevant programmes and continue with containment and certification activities.
7. Secure the financial resources necessary to implement the regional plan for eradication.